

**PROPOSED PLAN 8 GRAHAMSTOWN WIND ENERGY PROJECT  
GRAHAMSTOWN AREA, MAKANA MUNICIPALITY  
EASTERN CAPE PROVINCE OF SOUTH AFRICA**

**ENVIRONMENTAL IMPACT ASSESSMENT  
VOLUME 3: ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

**FINAL**

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## **REPORTS PRODUCED AS PART OF THIS EIA:**

Volume 1: Environmental Scoping Report

Volume 2: Specialist Reports

**Volume 3: Environmental Impact Assessment Report**

Volume 4: Environmental Management Programme

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## EXECUTIVE SUMMARY

### Background

Plan 8 (Pty) Ltd, a renewable energy company, plans to develop a wind powered electricity generation facility (known as a 'wind farm') approximately 30km outside of Grahamstown along the N2 in an easterly direction towards East London, in the Eastern Cape Province of South Africa. The proposed site is on the farms Gilead, Tower Hill and Peynes Kraal, and the project area lies within the Makana Local and Cacadu District Municipal jurisdictions. A section of the farm Tower Hill lies within the boundary of the Ndlambe Local Municipality but there are no turbines in this area. The proposed wind farm is planned to comprise up to a maximum of 27 turbines, each with a nominal power output ranging between 2 and 3 MW (megawatts). The total potential generating capacity of the wind farm will be approximately 67.5 MW, and will feed power into the national electricity grid. According to Plan 8 (Pty) Ltd, the motivation for the proposed project arose from the following potential benefits:

- **Electricity supply**

The establishment of the proposed Plan 8 Grahamstown Wind Energy Installation will contribute to strengthening the existing electricity grid for the area and will aid the government in achieving its goal of a 30% share of all new power generation being derived from Independent Power Producers (IPP).

- **Social upliftment**

The landowners approached by the Applicant to be part of this wind energy project expressed their commitment to the project in the hope that utilisation of portions of their land for wind turbines will be a source of additional income to supplement their farming income. Plan 8 (Pty) Ltd also intends to identify community development projects, in conjunction with local government, local community organisations and stakeholders, which will be implemented with the aim of improving the socio-economic environment in the Makana Municipality and the surrounding areas. These initiatives will at least meet the minimum requirements as defined by the Department of Energy in their qualification criteria for independent power producers (IPPs) in South Africa.

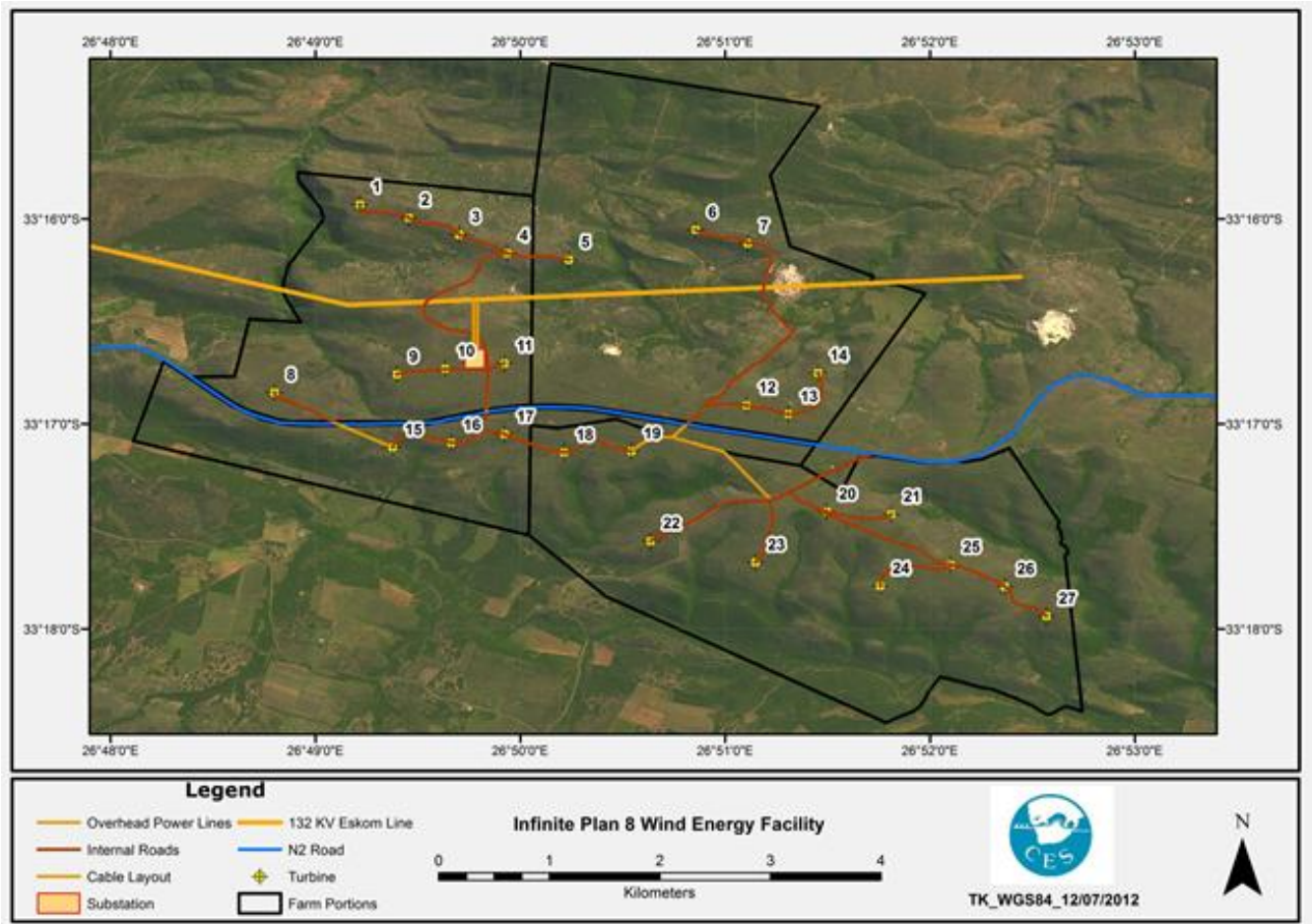
- **Climate change:**

Due to concerns over the potential impacts of climate change, and the ongoing exploitation of non-renewable resources, there is increasing international pressure on countries to increase their share of renewable energy generation. The South African Government has recognised the country's high level of renewable energy potential and has placed targets of 10 000 GWh of renewable energy by 2013. The Department of Energy currently utilises a competitive bid system to allocate tranches of power to successful IPPs who qualify to submit their bids by meeting the minimum requirements detailed in a Request for Proposal (RFP). Resources on this planet are finite and will become more expensive as they become more scarce and difficult to access. We need coal for many derivative products in our society. As a responsible generation we need to develop technologies that can replace the existing technologies which use the finite fossil fuel resource.

Further, in addition to the above-mentioned benefits, the proposed project site was selected due to:

- Good wind resources suitable for the installation of a large wind energy facility.
- Proximity to connectivity opportunities such as substations or high voltage (HV) overhead lines traversing the proposed development site. The specific substation to which the electrical cables will be connected will be confirmed at a later stage.
- The surrounding area is not densely populated.
- There is potential and appetite within the Makana Municipality to engage with new technologies and industries.

The proposed Plan 8 Grahamstown Wind Energy project study area is depicted in Figure 1 below.



**Figure 1: The proposed Plan 8 Grahamstown wind energy project, 30km north-east of Grahamstown**

### Project Description

The term wind energy describes the process by which wind turbines convert the kinetic energy in the wind into mechanical power, and a generator can then be used to convert this mechanical power into electricity. Typical turbine subsystems include:

- A rotor, or blades – the portion of the wind turbine that collects energy from the wind and converts this wind energy into rotational shaft energy to turn the generator.
- A nacelle (enclosure) containing a drive train, usually including a gearbox (some turbines do not require a gearbox) and a generator which converts the turning motion of a wind turbine’s blades (mechanical energy) into electricity.
- A tower, to support the rotor and drive train - the tower on which a wind turbine is mounted is not only a support structure, but it also raises the wind turbine so that its blades safely clear the ground and so can reach the stronger winds at higher elevations.
- Electronic equipment such as controls, electrical cables, ground support equipment, and interconnection equipment.

The Plan 8 Grahamstown Wind Energy Project will be spread over an area of approximately 2 550 hectares comprising three property parcels in the Makana Local Municipality area. One of the farms, Tower Hill, partly lies in the Ndlambe Local Municipality but there are no turbines located in this section. The three land portions are planned to host a total of up to 27 turbines, each with a nominal power output ranging between 2 and 3 megawatts (MW). The total potential generating

capacity of the wind farm will therefore be approximately 67.5MW, on the farms listed below:

1. Gilead farm: Gilead farm No 361, Division of Albany  
**SG Code: C 0020000000036100000**
2. Tower Hill: Coombs Vale farm No 3, Division of Albany  
**SG code: C 0080000000000300001**
3. Peynes Kraal: Peynes Kraal farm No 362, Division of Albany  
**SG Code: C 0020000000036200000**

The ultimate size of the wind turbines will depend on further technical assessments but will typically consist of horizontal axis rotor turbines (3 x 50m blades) with rotor diameters of 100 - 117 metres mounted atop an 80-100 metre-high steel or hybrid steel/concrete tower. As with all projects of this nature being developed by Independent Power Producers (IPPs) the electricity will be fed into the national ESKOM transmission grid. Typically, the development of the wind farm is divided into various phases:-

- *Pre-feasibility:* Plan 8 (Pty) Ltd conduct surveys to ensure that obvious issues surrounding the project should not impact on the progress and the final acceptance of the project. This includes visits to local authorities, civil aviation authorities, identifying local communities, wind resource evaluation from existing data, grid connectivity, environmental impact assessment, logistical and project phasing requirements.
- *Feasibility:* Plan 8 (Pty) Ltd will firm up and carry out thorough investigations to establish the actual costs and economic viability of the project by designing the financial model with financial institutions, verifying wind resources by onsite measurement, ensuring grid connection is economical and feasible in the timeframes of the project, identifying possible off-takers for the electricity. Once the feasibility studies are complete Plan 8 will identify which parts of the project will be constructed first. Then, in an organised fashion the project will be expanded according to the availability of grid capacity and turbines. There are five construction phases envisaged which will allow for economical implementation of the project.
- *Wind Measurement:* Prior to the establishment of the full facility, it will be necessary to erect a number of wind measurement masts to gather wind speed data and correlate these measurements with other meteorological data in order to produce a final wind model of the proposed project site. A measurement campaign of at least 12 months in duration is necessary to ensure verifiable data is used of the economics of the project and to finalise the positions of the wind turbines.
- *Implementation:* Building a wind farm is divided into three phases namely:
  1. Civil works and construction: An area of 35 m X 25 m needs to be cleared and excavated during the preliminary phase of the wind farm for access to the site during the construction phase by machines (bulldozers, trucks, cranes etc.).
  2. Construction involves the laying of foundations and electrical connections, cranes to erect the mast, blades and nacelle, and security fencing.
  3. Operational: During the period when the turbines are operational, there are only a few crews who carry out routine maintenance requiring only light vehicles to access the site. Only major breakdowns would necessitate the use of cranes and trucks.
- *Timing Estimation:*
  1. Preliminary phase = 9 weeks (including 4 weeks to let the foundation concrete achieve its final design strength)
  2. Civil Construction = 8-12 Months (mobilise contractors, set up site compound and batch plant, telephone, water and electricity connections, security fencing, construct access roads and hardstandings, cable trenches, substation compound, excavate for wind turbine generator (WTG) foundations, fix steel and shutters, cast and cure

- concrete for 27 turbines)
  - 3. Wind turbines erection = 8 months (Mechanical and electrical: Erect mast, nacelle, blades, install transformer for 27 WTG, lay 22kv or 33kv cable to sub-station, install sub-station 33kv/132kv, complete grid connection.)
  - 4. Commissioning and electrical connection = 4 months
  - 5. Demobilise site compound and clean up = 1 month
- *Refurbishment and rehabilitation of the site after operation:* Current wind turbines have a design life of around 25 years and this is the figure that has been used to plan the life span of this wind farm. If refurbishment is economical the facility life span could be expanded by another 25 years. Decommissioning of the wind energy facility at the end of its useful life will be undertaken in agreement with the landowners and according to the land use agreement. The intention of the project proponent is to ensure that all above-ground structures are removed and usable land restored to its original condition.

The implementation of a wind farm of the proposed installed capacity and turbine dimensions would require the following of overall construction timeframes and sequencing:

- Financial close 13 Dec 2013
- Pre construction design, and detailed environmental studies 13 Dec 2014
- Construction starts February 2015 and ends August 2016 (100 weeks)

## Legal Requirements

The EIA process is guided by regulations made in terms of Chapter 5 of the National Environmental Management Act No. 107 of 1998 (NEMA), as amended. The regulations (GNR. 543) set out the procedures and criteria for the submission, processing and consideration of and decisions on applications for the environmental authorisation of activities. Three lists of activities, published on 02 August 2010, as Government Notice Numbers R.544 to 546, the first two of which define the activities that require, respectively, a Basic Assessment (applies to activities with limited environmental impacts), or a Scoping and Environmental Impact Assessment (applies to activities which are significant in extent and duration). A third Government Notice, Number R.546, is province specific, and lists activities for which environmental authorisation is required if the activities take place in or in the vicinity of certain specified areas, including estuaries, protected or sensitive areas, and areas listed in international conventions such as the Ramsar Convention on Wetlands. The activities triggered by the proposed development are listed in Table 1 on the next page.

**Table 1: Listed activities potentially triggered by the proposed Plan 8 Grahamstown Wind Energy Project**

Number and date of the relevant notice	Activity No(s)	Describe each listed activity
Listing Notice 1: R.544	10	<p>The construction of facilities or infrastructure for the transmission and distribution of electricity-</p> <ul style="list-style-type: none"> <li>(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;</li> <li>(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.</li> </ul>
Listing Notice 1: R.544	11	<p>The construction of:</p> <ul style="list-style-type: none"> <li>(i) canals;</li> <li>(ii) channels;</li> <li>(iii) bridges;</li> <li>(iv) dams;</li> <li>(v) weirs;</li> <li>(vi) bulk storm water outlet structures;</li> <li>(vii) marinas;</li> <li>(viii) jetties exceeding 50 square metres in size;</li> <li>(ix) slipways exceeding 50 square metres in size;</li> <li>(x) buildings exceeding 50 square metres in size; or</li> <li>(xi) infrastructure or structures covering 50 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</li> </ul>
Listing Notice 1: R.544	13	<p>The construction of facilities or infrastructure for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 but not exceeding 500 cubic metres.</p>
Listing Notice 1: R.544	18	<p>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock or more than 5 cubic metres from:</p> <ul style="list-style-type: none"> <li>(i) a watercourse;</li> <li>(ii) the sea;</li> <li>(iii) the seashore;</li> <li>(iv) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater- but excluding where such infilling, depositing, dredging, excavation, removal or moving; <ul style="list-style-type: none"> <li>(a) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or</li> <li>(b) occurs behind the development setback line.</li> </ul> </li> </ul>
Listing Notice 1: R.544	38	<p>The expansion of facilities for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.</p>

Listing Notice 1: R.544	40	The expansion of (i) jetties by more than 50 square metres; (ii) slipways by more than 50 square metres; or (iii) buildings by more than 50 square metres (iv) infrastructure by more than 50 square metres within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, but excluding where such expansion will occur behind the development setback line.
Listing Notice 1: R.544	47	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre- (i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres – excluding widening or lengthening occurring inside urban areas.
Listing Notice 2: R.545	1	The construction of facilities or infrastructure for the generation of electricity where the electricity is 20 megawatts or more.
Listing Notice 2: R.545	8	The construction of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.
Listing Notice 2: R.545	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; Except where such physical alteration takes place for: (i) linear development activities; or (ii) agriculture or afforestation where activity 16 in this Schedule will apply.
Listing Notice 3: R.546	4	The construction of road wider than 4 metres with a reserve less than 13,5metres.
Listing Notice 3: R.546	10	The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.
Listing Notice 3: R.546	12	The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation
Listing Notice 3: R.546	13	The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation:
Listing Notice 3: R.546	14	The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation
Listing Notice 3: R.546	16	The construction of (iv) infrastructure covering 10 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line
Listing Notice 3: R.546	19	(19) The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.

Because the proposed development triggers a listed activity from GN R.545, it will require a full Scoping and EIA.

The competent authority that must consider and decide on the application for authorisation in

respect of the activities listed in Table 1 is the Department of Environmental Affairs (DEA), formerly the Department of Environmental Affairs and Tourism (DEAT), as the Department has reached agreement with all Provinces that all electricity-related projects, including generation, transmission and distribution, are to be submitted to DEA, irrespective of the nature of the applicant. This decision has been made in terms of Section 24(C) (3) of the NEMA (Act No 107 of 1998) and is effective for all projects initiated before, and up until, approximately 2015.

It is important to note that, in addition to the requirements for an authorisation in terms of the NEMA, there may be additional legislative requirements which need to be considered prior to commencing with the activity, for example: the National Heritage Resources Act (Act No 25 of 1999), the National Water Act (Act No 36 of 1998), the Civil Aviation Act (Act No 74 of 1962) as amended, the White Paper on Energy Policy for South Africa (Energy White Paper), the White Paper on Renewable Energy Policy (Renewable Energy White Paper), and the Integrated Energy Plan for the Republic of South Africa (March, 2003) etc.

### **The Environmental Impact Assessment**

Coastal & Environmental Services (CES), a well-established specialist environmental consulting firm with offices in Grahamstown and East London, have been appointed by Plan 8(Pty) Ltd as Environmental Assessment Practitioner (EAP) to conduct the Environmental Impact Assessment (EIA).

The EIA process is divided into two key phases - Scoping and Environmental Impact Assessment. This Final Scoping Report (FSR) presents the outcomes of the first phase of the environmental impact assessment process. The Scoping process has been undertaken to identify and describe:

- The nature of the proposed project;
- The legal, policy and planning context for the proposed project;
- Important biophysical and socio-economic characteristics of the affected environment;
- Potential environmental issues or impacts, so they may be addressed in the EIA phase;
- Feasible alternatives that must be assessed in the EIA phase;
- The Plan of Study (POS) for the EIA phase.

Provision was made in the Scoping Phase for the involvement of Interested and Affected Parties (I&APs) in the EIA process. The EIA phase follows directly from the Scoping phase and has now been completed. The aim of the detailed EIA phase was to undertake a comprehensive evaluation and study that addressed all the issues raised during Scoping and produce a report that contains all the relevant information that is necessary for the competent authority to consider the application and to reach a decision contemplated in Regulation 35. More specifically, the EIA phase has seven key objectives:

- Describe the biophysical and socio-economic environment that is likely to be affected by the proposed development.
- Undertake specialist studies to address the key biophysical and socio-economic issues.
- Assess the significance of impacts that may occur from the proposed development.
- Assess the alternatives proposed during the Scoping Phase.
- Provide details of mitigation measures and management recommendations to reduce the significance of impacts.
- Provide a framework for the development of an Environmental Management Programme (EMPr).
- Continue with the public participation process.

This Environmental Impact Assessment Report (EIR) is the culmination of the above requirements and objectives.

## **The Project Environment**

### ***Climate***

The study site in the Makana region falls in the heart of three major transitional climatic regions. Due to the location of the study area at the confluence of several climatic regimes, namely temperate and subtropical, the Eastern Cape Province of South Africa has a complex climate. There are wide variations in temperature, rainfall and wind patterns, mainly as a result of movements of air masses, altitude, mountain orientation and the proximity of the Indian Ocean. Winds and alternating cold and warm fronts thus make for a very variable climate throughout the region. Grahamstown normally receives about 466mm of rainfall per year and because it receives most of its rainfall during winter it has a Mediterranean climate.

### ***Geology and Soils***

Grahamstown is situated in the eastern part of the Cape Fold Belt and is underlain mainly by rocks of the Witteberg Group of the Cape Supergroup, and the Dwyka and Ecca groups of the Karoo Supergroup. In the general area, the oldest rocks of the Cape Supergroup are the shales and sandstones of the Weltevrede Formation, overlain by resistant quartz arenites of the Witpoort Formation. These quartzites are overlain by fine-grained shales and thin sandstones of the Lake Mentz and Kommadagga subgroups.

### ***Flora***

The vegetation of the Eastern Cape is complex and is transitional between the Cape and subtropical floras and many taxa of diverse phytogeographical affinities reach the limits of their distribution in this region. The region is best described as a tension zone where four major biomes converge and overlap.

### ***Fauna***

Lack of pristine terrestrial habitat in the Grahamstown area, particularly due to loss of natural vegetation caused by infestation by alien invasive species as well as urban development, has impacted on terrestrial fauna. Despite this, a few large mammals occur in the region, along with small and medium sized animals. Reptile and amphibians occurring in the area include many species of frogs, tortoises and terrapins, lizards and snakes. Important mammals occurring in the study area include 5 IUCN Red Data listed species.

### ***Socio-economic profile***

As the proposed Plan 8 Grahamstown Wind Energy Project is to be developed in the jurisdiction of the Makana Local Municipality (MLM), the project will affect this municipal community. The project site lies adjacent to the Ndlambe Local Municipality, and for this reason statistics related to this municipality are provided here. According to the South African Community Survey of 2007, the MLM's population declined from an estimated 75 302 in 2001 to about 70 059 in 2007. The NLM, has also seen a decline in its population; from 54 717 in 2001 to 46 359 in 2007. In terms of education, the 2001 South African Census indicates that both the NLM and MLM areas seem to have a significant percentage of residents who have no schooling (12% and 7% respectively), while only about 10% of both municipalities' residents appear to have matric. Considering employment rates, as per the 2001 data, it is estimated that about 51% of the economically active population of the MLM is employed, while this percentage increases for the NLM (which is about 59%). The most noticeable employment sectors include those related to community services, agriculture, wholesale and retail, as well as construction. This data therefore reinforces the need for the project to not only provide employment opportunities, but in so doing, keep the educated residents in the municipal areas to stimulate the economic sectors of the larger districts.



**Approach to the EIA for the proposed Plan 8 Grahamstown Wind Energy Project**

Based on the Plan of Study (PoS) for the detailed EIR Phase that was submitted to and approved by DEA and the main issues and concerns raised during the scoping phase of the proposed project (Table 2), the following specialist studies were undertaken:

- a) Noise
- b) Visual
- c) Bats
- d) Agricultural
- e) Ecological (flora & fauna)
- f) Avifauna (birds)
- g) Heritage
- h) Paleontological

All of these studies were undertaken by independent and skilled specialists from universities and private consulting companies (see details in Section 1.3 of this report).

The specific Terms of Reference (ToR) for each of the above-mentioned specialist studies, which outline the information required from each of the specialists, are outlined in the Scoping Report produced for this project.

The exact methodology used in each of the specialist studies is also provided in detail in the relevant specialist chapters in *Volume 2: Specialist Reports* (CES, January 2012).

It is important to note that, although specialists followed their own methodologies when conducting their studies in accordance with the Terms of Reference, they were required to provide the reports in a specific layout and structure, so that a uniform specialist report volume could be produced.

In addition to the above, in order to ensure that a direct comparison could be made between the various specialist studies, a methodology based on the CES rating scale was used by all the specialists when evaluating the significance of impacts. This methodology is discussed in detail in Appendix A of this EIR. A summary of the key findings of each of the specialist studies follows; and more details on these findings can be found in *Volume 2: Specialist Reports*.

**Table 2: The main issues and concerns raised during the scoping phase of the proposed Plan 8 Grahamstown Wind Energy Project included but were not limited to:**

Issue	Question/statement
<b>Telecommunication Interference: Vodacom Mast</b>	The proposed development takes place in close proximity to and surrounds a Vodacom Telecommunication mast. Will the turbines have any implications and interference on the electronic broadcasting from this mast?
<b>Socio-economic: Ecotourism</b>	The construction of a substantial Windfarm on the high lying ridge above Coombes Valley will impact negatively on all ecotourism and hunting concerns in the vicinity. There are potential negative impacts on surrounding game reserves that rely on a pristine environment for a satisfactory experience for their clients.
<b>Visual Intrusion</b>	A development of a Windfarm on this particular site, no matter how attractive it may be to the Developer and the Landowners will adversely impact upon other legitimate land-users and in particular Amaraka Investments No. 6 (Pty) Limited in that the visual pollution will be considerable and will in all probability make it more difficult if not impossible to sell ecotourism and safari operations on its property, and will most certainly reduce the value of its considerable investment in

	land.
<b>Avifauna and bats</b>	There are potential negative impacts on large bird populations via loss of useable habitat.

Mr Murray Crous, owner of Settlers Safaris hunting farm and Bushmans Gorge Lodge situated on Honeykop Farm, a neighbouring farm to the proposed Plan 8 Windfarm; and Mr Dave De La Harpe, Director of Amaraka Investments No. 6 (Pty) Limited, raised many concerns, including but not limited to the following: project description, motivation, benefits, public participation process, ecological functioning of the area, socio-economic benefits. Please refer to Appendix D for a full record of all issues and concerns, and responses to them. Included in this appendix are the copies of the correspondence received from I&APs who raised concerns.

The above issues and concerns were limited to the scoping phase prior to any specialist assessments. A comprehensive issues and response report for the entire EIA process is included in Appendix D.

**Key Findings of the Specialist Studies**

***Ecological Impact Assessment***

The vegetation types described by Mucina and Rutherford (2006) for the area are Kowie Thicket and Bisho Thornveld: both listed as near threatened. STEP describes the vegetation types of the area as Grahamstown grassland thicket, Albany Coastal Thornveld and Albany Valley Thicket, all Least Threatened, except for Albany Valley Thicket, listed as Vulnerable. Six vegetation types were found to occur in the area of the wind energy facility on the site visit in November 2011. These included degraded thicket, occurring over much of the site (low sensitivity), Fynbos, occurring in a restricted section to the southeast of the site (medium sensitivity), Fynbos, thicket, karoo mosaic, occurring on the top of slopes on the site (medium sensitivity), Rocky fynbos, occurring in very restricted portions of the site (high sensitivity), Thicket, occurring in valley bottoms throughout the site (high sensitivity) and Thicket mosaic, occurring to the north of the site (high sensitivity). Thirteen Species of Special Concern were found on site, and it is highly likely that more will be recorded in the construction phase if the development should go ahead. Alien species recorded from the study site included *Echinopsis spachiana* (Schedule 1), *Eucalyptus grandis* (Schedule 2), *Agave americana* (Schedule 2), *Opuntia ficus-indica* (Schedule 1) and *Acacia mearnsii* (Schedule 2). These invaders are required to be removed by law, as they are each Category 1: Declared Weeds or Category 2: Declared Invaders in terms of the Conservation of Agricultural Resources Act. Sensitivity analysis confirmed the presence of most of the turbines in areas of low sensitivity, with some in areas of medium sensitivity. No turbines occur in areas of high sensitivity.

***Avifauna Impact Assessment***

In total the avifauna specialist survey conducted in December 2011 identified 229 bird species that could occur in the proposed Plan 8 Grahamstown Wind Energy Project development area. Five “Vulnerable” and eight “Near Threatened” bird species (IUCN 2009) are found within the proposed project area. The five Species of Special Concern (SSC) which are all rated as “Vulnerable” may occur in the proposed project area including Denham’s Bustard, the Martial Eagle, the African Marsh Harrier, the White-bellied Korhaan and the African Finfoot. In addition, the White Stork *Ciconiaciconia* was included here as it is afforded protection internationally under the Bonn Convention on Migratory Species. The Hamerkop *Scopus umbretta* was also included as recent bird atlas data revealed that its range has declined substantially. Overall, the avifaunal study found that the proposed Plan 8 Grahamstown Wind Energy Project should not pose any significant environmental threat to the surrounding avifaunal population if all the mitigation measures and recommendations were implemented.

### ***Bat (Chiroptera) Impact Assessment***

The general bat activity in the project area is moderate and higher concentrations exist in certain areas such as the lower parts, valleys and drainage lines. These areas can draw elevated numbers of insects and will therefore be utilised by bats. High flying species such as *Tadarida aegyptiaca* and *Miniopterus natalensis* are the most at risk by wind turbines. These species will readily pass through, and even forage to some degree, in high lying areas where winds are stronger and insects less, motivating further for the implementation of mitigation measures.

The small watercourses and sheltered valleys have been assigned a 150 m buffer. These buffer areas should be treated as sensitive and no turbines are allowed to be sited in the buffers. The areas marked as having a Moderate Sensitivity are assigned as such due to topography and a higher amount of roosting space offered by the terrain in that area. Turbines located in the Moderate Sensitivity area should be prioritised during mitigation measures and must receive special attention during monitoring, although all turbines in the project area are subject to mitigation measures.

Since the possibility of the site being located in a migration path still exists it is recommended that a long-term pre-construction monitoring study be undertaken to determine whether migrating cave bats may be at risk by the proposed wind farm. It is recommended that the curtailment mitigation measure be implemented on all turbines on the site, based on correlations found between wind speed and bat activities during the long-term study. This mitigation strategy might impact the bankability of the project. It is suggested that specific mitigation strategies concerning bats are put in place after the impacts are better understood following the long term monitoring. The sonar mitigation strategy will be tested first before curtailment is introduced.

### ***Heritage Impact Assessment***

Apart from two unmarked graves and an old horse/oxen drawn plough no material culture or structural remains of historical significance were observed in the studied area. Two isolated artefacts of Stone Age origin were recorded and a cave with rock paintings occurs in one of the gorges. It is recommended that the burials not be disturbed and that a buffer zone of at least 15m in radius should be put in place in the form of a balustrade or suitable wooden palisade fencing. The rock art site is considered to be of high significance, but it will not be directly impacted by the proposed activity because it is situated in a gorge and because wind turbine sites occur on high lying areas.

### ***Paleontological Impact Assessment***

The development area is focussed on Witpoort Formation quartzite ridges which were not, at surface, found to be significantly fossiliferous. Potentially important interbedded black shales within the quartzites are kaolinised to a deep depth. There is therefore only a low likelihood that palaeontological resources will be discovered or destroyed by the proposed development.

It is recommended that should any possible palaeontological material be disturbed during the development, SAHRA should be immediately informed and a qualified palaeontologist appointed to investigate. Furthermore, at the end of the initial construction phase, prior to rehabilitation a palaeontologist should survey all material excavated during installation of the towers and disturbed during construction of road and cable networks.

### ***Visual Impact Assessment***

The landscape character of the region is rural-agricultural and three main landscape character types were identified and they all have a low sensitivity to changes brought by the wind farm. The visual absorption capacity for the development is low due to the size of the wind farm and the

height of the turbines. Several buildings are located within 1 kilometre of the nearest wind turbine (according to the most recent development layout) and shadow flicker will affect a single homestead beyond the permissible threshold (Coombs Vale, 35 and 24 minutes per year). Mitigation measures include planting vegetation near sensitive buildings such that shadow flicker hours are reduced or eliminated, or install sensors in buildings to detect shadow flicker and regulate operation of the wind turbine which is causing the effect.

Visual impact criteria used to assess impacts were: viewer sensitivity, visibility of development, visual exposure and visual intrusion. Residents of urban areas, rural villages, residents on surrounding farms as well as scenic viewpoints and protected areas are considered highly sensitive. Due to the tall structures and their position in the topography, the visibility of development will be a high impact. Visual exposure for residents of surrounding farms and motorists on sections of the N2 will be high, moderate to high for some areas within Trumpeter’s Drift, Elephant Park and Kap River nature reserve and low for residents of rural villages and surrounding urban areas more than 10 km away. When in close proximity to the turbines, motorists will experience high visual intrusion while some game farms will experience moderate to high visual intrusion. The impact of the visual intrusion was assessed as moderate to low for residents of rural villages (due to distance away) and residents of surrounding farms (wind farms are seen as compatible with agricultural landscapes internationally).

**Noise Impact Assessment**

In terms of noise impacts there will be an impact on the immediate surrounding environment from the construction activities, especially if pile driving is to be done. This will, however, only occur if the underlying geological structure requires piled foundations. The area surrounding the construction site will be affected for short periods of time in all directions, should several pieces of construction equipment be used simultaneously. The number of construction vehicles that will be used in the project will add to the existing ambient levels and will most likely cause a short term disturbing noise. The ambient day time noise level during the day and at night is displayed in tables 3 and 4.

The noise produced by the Nordex N100 wind turbines will exceed the 45 dB(A) day/night limit at the main house on Payne’s Kraal (6-12m/sec wind speed) as well as both workers houses (8-12m/sec wind speed). The noise produced by the Nordex N90 wind turbines will exceed the 45dB(A) day/night limit at the main house on Peynes Kraal at 12 m/sec (45.1 dB). It is not foreseen that the turbine noise will be heard at 12 m/sec wind speed due to masking of the ambient noise at this high wind speed. The impact of low frequency noise and infrasound will be negligible and there is no evidence to suggest that adverse health effects will occur, as the sound power levels generated in the low frequency range are not high enough to cause physiological effects.

**Table 3: Day time ambient noise level results**

Location	Start Time	Duration (minutes)	Wind (m/s) *(At Microphone)	Temperature (° Celsius) *(At Microphone)	L <sub>Req,T</sub> dB(A)	Comments
Peyneskraal Farmhouse	15:45	10	4.9m/s	13.6° c	49.5	Birds & dogs barking; Traffic noise from N2
Jakkelsdraai Farmhouse (Main)	16:50	10	3.8m/s	13.1° c	45.6	Traffic noise from N2

\*Author measurements of wind speed and temperature at microphone height.

**Table 4: Night time ambient noise level results taken on the 29th of June and 23rd July.**

Date	Location	Start Time	Duration (minutes)	L <sub>Req,T</sub> dB(A)	Comments
29 <sup>th</sup> June 2012	Honeykop Farmhouse	22:26	10	43.2	<ul style="list-style-type: none"> <li>• Distant traffic</li> <li>• Persons walking on gravel</li> </ul>
29 <sup>th</sup> June 2012	Peyneskraal Farmhouse	22:56	10	46.2	<ul style="list-style-type: none"> <li>• Distant traffic</li> </ul>
29 <sup>th</sup> June 2012	Jakkeldraai Farmhouse (Main)	23:26	10	47.7	<ul style="list-style-type: none"> <li>• Distant traffic</li> <li>• Distant dog barking</li> <li>• Sheep and other farm animals</li> </ul>
23 <sup>rd</sup> July 2012	Honeykop Farmhouse	22:15	10	37.1	<ul style="list-style-type: none"> <li>• Distant traffic</li> <li>• Farm animals</li> <li>• Diesel engine</li> </ul>
23 <sup>rd</sup> July 2012	Peyneskraal Farmhouse	22:45	10	31.2	<ul style="list-style-type: none"> <li>• 3 cars in distance</li> </ul>
23 <sup>rd</sup> July 2012	Jakkeldraai Farmhouse (Main)	23:05	10	41.4	<ul style="list-style-type: none"> <li>• 3 cars in distance</li> <li>• Farm animals making a noise</li> </ul>

***Agricultural Resource Assessment***

Four potential impacts were identified by the agricultural resources assessment. These included possible change of use of agricultural land, loss of vegetation, pollution of water sources as well as erosion that could be caused as a result of the removal of cover vegetation as the soils in the study area generally have a high erosion index rating. The No-Go option was also assessed. Soil sampling of the proposed site indicated that all but one proposed turbine sites are of low agricultural potential and only suitable for natural grazing.

The proposed site for Turbine 6 that did have cultivation potential, according to the sampling study, was not a viable option as the area was subject to high wind erosion. Dryland cropping for this site was also excluded as an alternative due to the erratic rainfall and lack of an irrigation water source. In this report it was also recommended that certain turbines have their positions moved by 50-100 metres to avoid unsuitably steep sites where erosion could become a problem during construction.

***Geotechnical Assessment***

The hills where the wind turbines are to be situated are mostly of exposed surface or shallow underlying rock of generally fine to medium grained quartzite or sandstone of the Witpoort Formation. The higher hills have localised areas of silcrete. There are no major geological faults in the area. Much of the level area is covered with soils of varying depth. In terms of foundation conditions this is a highly favourable site. Where possible, turbine foundations should be founded on rock. Where soils are too deep to allow this, deep concrete foundations will be required. Where there is no soil, consideration should be given to the use of rock anchors.

Due to the draining nature of the rock, which is highly jointed, the ground water table will be far below any concrete foundation base. This is also due to the position of the wind turbines being on the higher ground in the area. Due to the presence of surface rock over parts of the area it will be difficult to excavate cable trenches approximately 20% of the time. In these cases, localised blasting may be required. For the rest of the cable length use of a ripper should suffice. There are sufficient borrow pits in the surrounding area that can provide material for access roads of satisfactory grade. In some places, gradient and required turning radius makes access roads

impossible without a re-design of the roads.

In summary, ground conditions are stable and there are no slope stability problems. Care needs to be taken during construction to mitigate soil erosion as the top soil is thin. Geotechnical constraints are minor and relate to the presence of surface or shallow hard rock over the areas where the turbines are to be installed.

### **Summary of the potential Impacts of the proposed Plan 8 Grahamstown Wind Energy Project**

Tables 5, 6 and 7 below provide a summary of the impacts associated with the proposed Plan 8 Grahamstown Energy Project as a whole, with and without mitigation.

**Table 5: Summary of the impacts associated with the proposed Plan 8 Grahamstown Wind Energy Project during the construction phase**

Construction Phase				
Impact Study	Impact #	Impact Type	Significance	
			Without mitigation	With mitigation
Ecological	1	Loss of Degraded thicket	LOW-	LOW-
	2	Loss of Fynbos	LOW-	LOW-
	3	Loss of Fynbos, Thicket, Karoo mosaic	LOW-	LOW-
	4	Loss of Thicket mosaic	LOW-	LOW-
	5	Loss of plant species of special concern	HIGH-	LOW-
	6	Loss of animal species of special concern	LOW-	LOW-
	7	Loss of Biodiversity	MOD-	LOW-
	8	Fragmentation of vegetation and edge effects	LOW-	LOW-
	9	Invasion of alien species	MOD-	MOD+
Avifauna	10	Habitat destruction	LOW-	LOW-
	11	Disturbance of birds	MOD- to LOW-	LOW-
Bat	12	Destruction of bat foraging habitat	MOD-	LOW-
	13	Destruction of bat roosts	MOD-	LOW-
Heritage	14	Impact on heritage resources	MOD-	LOW-
Noise	15	Potential construction noise sources (construction vehicles)	LOW-	LOW-
Visual	16	Impact of construction activities on sensitive visual receptors	HIGH-	HIGH-
	17	Intrusion of large, highly visible wind turbines on the existing views	HIGH-	HIGH-
	18	Impact of night lights of a wind farm on existing nightscape	MOD-	MOD-
Agriculture	19	Loss of vegetation	VERY HIGH-	HIGH-
	20	Pollution of water sources	HIGH-	MODERATE-
	21	Erosion and construction on land with a gradient	VERY HIGH-	MODERATE-

**Table 6: Summary of the impacts associated with the proposed Plan 8 Grahamstown Wind Energy Project during the operational phase**

Operational Phase				
Impact Study	Impact #	Impact Type	Significance	
			Without mitigation	With mitigation
Ecological	1	Invasion of alien species	HIGH-	MOD+

<b>Avifauna</b>	<b>2</b>	Bird collision and electrocution on overhead power lines, Impact on Red Listed and other species	<b>MOD -</b>	<b>LOW -</b>
	<b>3</b>	Bird disturbance and displacement from area as result of wind turbines and other infrastructure	<b>LOW -</b>	<b>LOW -</b>
	<b>4</b>	Bird collision with turbine blades	<b>MOD -</b>	<b>MOD -</b>
<b>Bat</b>	<b>5</b>	Bat mortalities during foraging by turbine blades	<b>HIGH-</b>	<b>MOD-</b>
	<b>6</b>	Bat mortalities during migration by turbine blades	<b>HIGH-</b>	<b>MOD-</b>
<b>Heritage</b>	<b>7</b>	Impact on heritage resources	<b>MOD-</b>	<b>LOW-</b>
<b>Noise</b>	<b>8</b>	Predicted noise levels for wind turbine generators	<b>HIGH-</b>	<b>LOW-</b>
<b>Visual</b>	<b>9</b>	Potential landscape impact	<b>MOD-</b>	<b>MOD-</b>
	<b>10</b>	Impact of shadow flicker on residents in close proximity to wind turbines	<b>MOD-</b>	<b>LOW-</b>
<b>Agriculture</b>	<b>11</b>	Possible change of use of agricultural land	<b>MOD-</b>	<b>LOW-</b>

Table 7: Summary of the impacts associated with the proposed Plan 8 Grahamstown Wind Energy Project assuming the No-Go option

<b>No Go</b>				
	<b>Impact Study</b>	<b>Impact #</b>	<b>Impact Type</b>	<b>Significance</b>
<b>CONSTRUCTION</b>	<b>Ecological</b>	<b>1</b>	Loss of Degraded thicket	<b>MOD-</b>
		<b>2</b>	Loss of Fynbos	<b>MOD-</b>
		<b>3</b>	Loss of Fynbos, Thicket, Karoo mosaic	<b>MOD-</b>
		<b>4</b>	Loss of rocky Fynbos	<b>N/A</b>
		<b>5</b>	Loss of Thicket	<b>N/A</b>
		<b>6</b>	Loss of Thicket mosaic	<b>MOD-</b>
		<b>7</b>	Loss of plant species of special concern	<b>MOD-</b>
		<b>8</b>	Loss of animal species of special concern	<b>MOD-</b>
		<b>9</b>	Loss of Biodiversity	<b>MOD-</b>
		<b>10</b>	Fragmentation of vegetation and edge effects	<b>LOW-</b>
		<b>11</b>	Invasion of alien species	<b>HIGH-</b>
	<b>Avifauna</b>	<b>12</b>	Habitat destruction	<b>N/A</b>
		<b>13</b>	Disturbance of birds	<b>N/A</b>
	<b>Bat</b>	<b>14</b>	Destruction of bat foraging habitat	<b>N/A</b>
		<b>15</b>	Destruction of bat roosts	<b>N/A</b>
	<b>Heritage</b>	<b>16</b>	Impact on heritage resources	<b>MOD+</b>
	<b>Noise</b>	<b>18</b>	Potential construction noise sources (construction vehicles)	<b>MOD+</b>
	<b>Visual</b>	<b>19</b>	Impact of construction activities on sensitive visual receptors	<b>N/A</b>



		<b>20</b>	Intrusion of large, highly visible wind turbines on the existing views of sensitive visual receptors	N/A
		<b>21</b>	Impact of night lights of a wind farm on existing night scape	N/A

<b>OPERATIONAL</b>	<b>Ecological</b>	<b>1</b>	Invasion of alien species	<b>HIGH-</b>
	<b>Avifauna</b>	<b>2</b>	Bird collision and electrocution on overhead power lines, Impact on Red Listed and other species	N/A
		<b>3</b>	Bird disturbance and displacement from area as result of wind turbines and other infrastructure	N/A
		<b>4</b>	Bird collision with turbine blades	N/A
	<b>Bat</b>	<b>5</b>	Bat mortalities during foraging by turbine blades	N/A
		<b>6</b>	Bat mortalities during migration by turbine blades	N/A
	<b>Heritage</b>	<b>7</b>	Impact on heritage resources	MODERATE+
	<b>Agriculture</b>	<b>8</b>	Not proceeding with wind farm construction	MODERATE-
	<b>Noise</b>	<b>9</b>	Predicted noise levels for wind turbine generators	MODERATE+
	<b>Visual</b>	<b>10</b>	Potential landscape impact	MODERATE+
		<b>11</b>	Impact of shadow flicker on residents in close proximity to wind turbines	N/A

## EAP's Recommendation

The decision regarding whether to proceed with the proposed development should be based on weighing up the positive and negative impacts as identified and assessed by the independent specialists. In addition to the findings of the specialist studies, it is also necessary to consider the following when making a decision:

- The majority of the impacts associated with the proposed project can be mitigated by applying specialist study findings and recommendations or the realignment of a minimum number of turbines (albeit that they may potentially be in less efficient locations for electricity generation) and this is reflected further on in this report;
- The refined layout referred to above takes the identified environmental sensitivities and constraints into account in delineating road access, construction phase infrastructure and laydown area requirements;
- With regards to the two points above, it is suggested that turbines 1, 15 and 20 of the final layout presented in this report be moved slightly to avoid the 150 m buffer around bat sensitive areas;
- The nature of the site on which the facility is to be sited is suited to the development proposal with easy access provided from the N2 highway and relative proximity to the ports of Coega and Port Elizabeth;
- The project proponent has taken the issues raised by interested and affected parties into consideration and made changes to the layout where possible;
- The project has extensive potential environmental and socio-economic benefits including the generation of clean energy for Makana Local Municipality (MLM);
- The project will contribute directly and significantly to social upliftment of the local community; and
- This EIA process has enabled the provision of accurate and relevant information required for informed decision making.

Based on the above, it is believed that, with the implementation of appropriate mitigation measures and understanding that certain visual impacts cannot be mitigated, the cumulative benefits of the proposed Plan 8 Grahamstown Wind Energy Project will outweigh the negative impacts and it is the opinion of the EAP that the No-Go option should not be considered any further, and that the proposed Plan 8 Grahamstown Wind Energy Project should be granted authorisation.

In addition to this the proposed project will aid in:-

- The reduction of greenhouse gases by the use of alternatives to fossil fuel - derived electricity will assist South Africa to begin demonstrating its commitment to meeting international obligations/legislative instruments such as the 1992 United Nations Framework Convention on Climate Change (FCCC) and the Kyoto Protocol (2002);
- Meeting the goals of the White Paper on the Energy Policy for South Africa (Energy White Paper) which aims to create energy security by diversifying energy supply and energy carriers and sets out the policy principles, goals and objectives to achieve, "*An energy economy in which modern renewable energy increases its share of energy consumed and provides affordable access to energy throughout South Africa, thus contributing to sustainable development and environmental conservation*", and;
- The Department of Minerals and Energy (DME) (now the Department of Energy) Integrated Energy Plan (IEP) to develop the renewable energy resources, while taking safety, health and the environment into consideration setting a target of, "*10 000 GWh (0.8Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro*".
- South Africa has also often experienced major power shortages largely as a result of demand outstripping supply. This, in many cases, has resulted in financial losses (many of the sectors contributing to the GDP are practically driven by electricity) and impacted on quality of life (hospitals and schools were among the affected, jobs were lost etc.). The national power utility, Eskom, has indicated that South Africa is not past this crisis and that

the possibility of further power cuts remains. With local generation, the networks can be freed up to supply power to other areas and the local community will have a much better chance of more consistent supply. It is anticipated that the project can supply more than the MLM's current daytime electricity demand during all seasons.

In addition to the above, the EAP recommends that the project only be granted authorisation under certain conditions, in order to address those impacts with a high significance rating, and included in Chapter 8 of this report. One such condition strongly suggested that the recommendations made in *Volume 4: Environmental Management Programme Proposed Plan 8 Grahamstown Wind Energy Project* (CES, January 2012) also be followed.

Of particular relevance is the recently developed avifauna and bat monitoring programme. It is recommended that this programme become a standard condition of authorisation for all wind energy projects. It is recommended that the DEA further refine these programmes (for birds and bats) as a standard condition of authorisation. These monitoring programmes will be invaluable in guiding the micro-siting of the turbines as more data becomes available.

### **The Way Forward – Environmental Authorisation Phase**

Following public review, this EIR, together with the Specialist Volume (Volume 2) and the EMP (Volume 4), have been amended as necessary and finalised, incorporating any comments received. It will now be submitted to the DEA.

Within 60 days of the receipt of the Final EIR, the competent authority must in writing either:

- Accept the report
- Notify the applicant that the report has been referred for specialist review
- Request that the applicant make amendments to the report in order for it to be accepted
- Reject the report

Within 45 days of accepting the report, the competent authority must:

- Grant an authorisation for all or part of the activities applied for
- Refuse an authorisation for all or part of the activities applied for

Should an Environmental Authorisation be granted, it will carry Conditions of Approval. The project proponent is obliged to adhere to these conditions.

Within a period determined by the competent authority, all registered I&APs will be notified in writing of (i) the outcome of the application, and (ii) the reason for the decision. The public will then be given an opportunity to appeal the decision should they wish to do so. The appeals procedure, which is described in detail in the NEMA EIA Regulations, will also be communicated to I&APs by the EAP.

## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION.....</b>	<b>1</b>
1.1	Background to the study.....	1
1.2	The Environmental Impact Assessment Process.....	1
1.3	The Environmental Assessment Practitioner.....	9
<b>2</b>	<b>PROJECT DESCRIPTION.....</b>	<b>15</b>
2.1	Location and site description of the proposed development.....	15
2.2	Detailed description of the Plan 8 Grahamstown Wind Energy project.....	15
2.2.1	<i>Turbine specifications</i> .....	16
2.2.2	<i>Additional Infrastructure requirements</i> .....	17
2.2.3	<i>Construction Phase</i> .....	23
2.2.4	<i>Operational phase</i> .....	26
2.2.5	<i>Refurbishment and rehabilitation of the site after operation</i> .....	26
<b>3</b>	<b>DESCRIPTION OF THE AFFECTED ENVIRONMENT.....</b>	<b>27</b>
3.1	The Bio-physical Environment.....	27
3.1.1	<i>Climate</i> .....	27
3.1.2	<i>Topography</i> .....	27
3.1.3	<i>Geology and Soils</i> .....	28
3.2	Vegetation and Floristics.....	29
3.2.1	<i>Species of Special Concern (SSC)</i> .....	31
3.2.2	<i>Alien invasive species</i> .....	31
3.2.3	<i>Regional Vegetation</i> .....	31
3.2.4	<i>Subtropical Thicket Ecosystem Planning (STEP) Project</i> .....	36
3.2.5	<i>Vegetation of the study area</i> .....	39
3.3	Fauna.....	40
3.3.1	<i>Habitats</i> .....	40
3.3.2	<i>Vertebrates</i> .....	40
3.3.3	<i>Animal species of special concern</i> .....	41
3.4	Terrestrial Invertebrates.....	41
3.5	Land Use and the Eastern Cape Biodiversity Conservation Plan (ECBCP).....	41
3.6	Heritage characteristics.....	45
3.6.1	<i>Archaeology and heritage structures</i> .....	45
3.7	Palaeontology.....	46
3.8	Socio-economic profile.....	46
<b>4</b>	<b>NEED AND DESIRABILITY ASSESSMENT.....</b>	<b>50</b>
<b>5</b>	<b>ALTERNATIVES.....</b>	<b>51</b>
5.1	Fundamental alternatives.....	51
5.2	Incremental alternatives.....	52
5.3	Design/Layout Alternatives.....	52
5.4	Technology Alternatives.....	53
5.5	Scheduling Alternatives.....	53
5.6	The 'NO-GO' alternative.....	53
<b>6</b>	<b>KEY FINDINGS OF THE SPECIALIST STUDIES.....</b>	<b>54</b>
6.1	Ecological Impact Assessment.....	54
6.2	Avifauna Impact Assessment.....	56
6.3	Bat (Chiroptera) Impact Assessment.....	57
6.4	Heritage Impact Assessment.....	58
6.5	Palaeontological Impact Assessment.....	59
6.6	Visual Impact Assessment.....	60
6.6.1	<i>Visibility</i> .....	60
6.6.2	<i>Sensitive Viewers and Viewpoints</i> .....	60
6.6.3	<i>Visual Exposure</i> .....	61
6.6.4	<i>Visual Intrusion</i> .....	65
6.6.5	<i>Shadow Flicker</i> .....	66
6.7	Noise Impact Assessment.....	69

6.7.1	<i>Predicted Noise Levels for the Construction Phase</i> .....	69
6.7.2	<i>Predicted noise levels for the Operational Phase</i> .....	72
6.8	Agricultural Assessment .....	74
6.9	Geotechnical Assessment .....	74
<b>7</b>	<b>IMPACT ASSESSMENT</b> .....	<b>76</b>
7.1	Construction Phase Impacts .....	76
7.1.1	<i>Flora and Vegetation</i> .....	76
7.1.2	<i>Avifauna</i> .....	83
7.1.3	<i>Bats (Chiroptera)</i> .....	84
7.1.4	<i>Archaeology</i> .....	86
7.1.5	<i>Noise</i> .....	86
7.1.6	<i>Visual</i> .....	89
7.1.7	<i>Agriculture</i> .....	92
7.2	Operational Phase Impacts .....	95
7.2.1	<i>Flora and Vegetation</i> .....	95
7.2.2	<i>Avifauna</i> .....	95
7.2.3	<i>Bats (Chiroptera)</i> .....	97
7.2.4	<i>Archaeology</i> .....	100
7.2.5	<i>Noise</i> .....	100
7.2.6	<i>Visual</i> .....	104
7.2.7	<i>Agriculture</i> .....	106
7.2.8	<i>Socio-Economic Impact Assessment</i> .....	107
<b>8</b>	<b>CONCLUSIONS AND RECOMMENDATIONS</b> .....	<b>109</b>
8.1	Summary of the Key Findings of the EIA .....	109
8.2	EAP's Recommendation.....	119
8.3	The Way Forward .....	126

## LIST OF FIGURES

Figure 1: The proposed Plan 8 Grahamstown wind energy project, 30km north-east of Grahamstown .....	ii
Figure 1-1: The EIA process under current legislation (NEMA 1998) as amended .....	6
Figure 2-1: Principal components within and attached to the nacelle .....	16
Figure 2-2: Illustration of the floor plan for the crane hardstanding area .....	18
Figure 2-3: Preliminary locality map indicating the location of the proposed Plan 8 Grahamstown Wind Energy Project .....	19
Figure 2-4: Preliminary site layout plan indicating turbines, roads, powerlines, substation and project cabling connections .....	20
Figure 2-5: The final turbine and infrastructure layout, that has been developed after taking all environmentally sensitive areas into account .....	21
Figure 2-6: The final EIA and infrastructure wind farm layout, indicated on a 1:50000 topo-cadastral map ..	22
Figure 2-7: Illustration of the main components of a typical wind turbine (note that the transformer can be located inside the tower section of each turbine).....	23
Figure 2-8: The main dimensions for the foundation of a 3MW/100m high wind turbine.....	24
Figure 2-9: Assembly and erection of the tower sections.....	25
Figure 3-1: Simplified geological map of the area around Grahamstown .....	29
Figure 3-2: The Albany Centre of Endemism, also known as the 'Albany Hotspot', has long been recognised as an important centre of plant species diversity and endemism .....	30
Figure 3.3: Mucina and Rutherford vegetation map of the study area .....	35
Figure 3-4: STEP vegetation map of the study area.....	38
Figure 3-5: CBAs occurring in and around the proposed project area .....	43
Figure 3-6: Map of the study area in relation to corridors and protected areas as described .....	44
by the MBCP .....	44
Figure 6-1: Map of the proposed wind energy facility showing the varying sensitivity of the site .....	55
Figure 6-2: Avifaunal sensitivity map for the proposed project .....	57
Figure 6-3: Bat sensitivity map .....	58
Figure 6-4: Heritage sensitivity map, indicating the location of the identified heritage sites, with 15m buffer zone .....	59
Figure 6-5: Map showing the cumulative viewshed for the wind farm .....	62
Shades of red indicate areas where views of the wind farm will contain most of the wind turbines (potentially all the turbines). Green lines on the map show positions of protected areas .....	62
Figure 6-6: Visual exposure calculated from visibility and distance from nearest turbine .....	64
Figure 6-7 Sites that may be affected by shadow flicker from nearby wind turbines .....	68
Figure 6-8: The NSA's at which the ambient noise level for the area was measured .....	71
Figure 8-1: Turbine layout subject to EIA phase assessment, including existing/proposed access roads and cable layouts in relation to identified sensitivities .....	111
Figure 8-2: Bird Sensitive Areas.....	112
Figure 8-3: The final EIA phase layout, depicted in relation to bat, heritage, ecological and noise sensitive areas .....	113
Figure 8-4: The final EIA phase layout depicted in relation to the bird sensitive areas .....	114
Figure 8-5: The positioning of final project infrastructure in relation to drainage lines .....	115

## LIST OF TABLES

Table 1: Listed activities potentially triggered by the proposed Plan 8 Grahamstown Wind Energy Project ....	v
Table 2: The main issues and concerns raised during the scoping phase of the proposed Plan 8 Grahamstown Wind Energy Project included but were not limited to: .....	ix
Table 3: Day time ambient noise level results.....	xii
Table 4: Night time ambient noise level results taken on the 29th of June and 23rd July .....	xiii
Table 5: Summary of the impacts associated with the proposed Plan 8 Grahamstown Wind Energy Project during the construction phase .....	xv
Table 6: Summary of the impacts associated with the proposed Plan 8 Grahamstown Wind Energy Project during the operational phase.....	xv
Table 7: Summary of the impacts associated with the proposed Plan 8 Grahamstown Wind Energy Project assuming the No-Go option.....	xvi
Table 1-1: Listed activities potentially triggered by the proposed Plan 8 Grahamstown Wind Energy Project .	2

Table 1-2: The Specialists involved in the EIA Phase .....	11
Table 1-3: EIA regulation requirements and structure of the report .....	12
Table 2-1: Erf numbers that comprise the farms proposed for Plan 8 Grahamstown Wind Energy Project ...	15
Table 3-1: Summary of the STEP Project conservation priorities, classifications and general rules .....	36
Table 3-2: Terrestrial Critical biodiversity Areas and Biodiversity Land Management Classes as described by the Eastern Cape Biodiversity Conservation Plan.....	42
Table 3-3: Terrestrial BLMCs and Land Use Objectives .....	42
Table 3.4: Educational status of the NLM and MLM .....	48
Table 3.5: Employment Sectors of the NLM and MLM .....	49
Table 6-1: Summary of the visual impacts .....	66
Table 6-2: Buildings with potential risk of being affected by shadow flicker .....	67
Table 6-3: Typical Construction Noise .....	69
Table 6-4: Combining Different Construction Noise Sources – High Impacts (Worst Case) .....	69
Table 6-5: Combining Different Construction Noise Sources – Low Impacts .....	69
Table 6-6: Day time ambient noise level results .....	70
Table 6-7: Night time ambient noise level results taken on the 29th of June and 23rd July.....	70
Table 6-8: Attenuation by distance for the construction phase (worst case) .....	72
Table 6-9: Summary of noise impacts on NSAs at various wind speeds (Nordex N100) .....	72
Table 6-10: Summary of noise impacts on NSAs at various wind speeds (Nordex N90) .....	73
Table 7-1: Typical types of vehicles and equipment to be used on site (Construction Phase) .....	87
Table 7-2: Typical Construction Noise .....	87
Table 7-3: Combining Different Construction Noise Sources – High Impacts (Worst Case) .....	87
Table 7-4: Combining Different Construction Noise Sources – Low Impacts .....	88
Table 7-5: Attenuation by distance for the construction phase (worst case) .....	88
Table 7-6: Predicted noise levels at the NSA's during the operational phase .....	101
Table 8-1: Summary of the impacts associated with the proposed Plan 8 Grahamstown Wind Energy Project during the construction phase .....	116
Table 8-2: Summary of the impacts associated with the proposed Plan 8 Grahamstown Wind Energy Project during the operational phase.....	117
Table 8-3: Summary of the impacts associated with the proposed Plan 8 Grahamstown Wind Energy Project assuming the NO-GO option .....	117

## LIST OF PLATES

Plate 3-1: Topography of the site .....	28
Plate 3-2: Confirmed Species of Special Concern (CSSC).....	32
Plate 3-3: Some alien invasive species .....	33
Plate 3-4: Vegetation types from the study area .....	39
Plate 7-1: Construction of the existing Coega wind turbine .....	90
Plate 7-2 – Nordex N100 2.5MW Result 12m.s <sup>-1</sup> wind speed.....	104
Plate 7-3 – Nordex N90 2.5MW result 12m.s <sup>-1</sup> wind speed .....	104

## APPENDICES

APPENDIX A: THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS	132
APPENDIX B: CORRESPONDENCE FROM AUTHORITIES	140
APPENDIX C: PLAN OF STUDY SUBMITTED TO DEA	141
APPENDIX D: PUBLIC PARTICIPATION	162
APPENDIX E: COPIES OF TITLE DEEDS	260
APPENDIX F: COPY OF WATER AVAILABILITY FROM DWA	210
APPENDIX G: LETTER FROM ESKOM CONFIRMING ABILITY TO CONNECT FACILITY	211

## LIST OF ACRONYMS AND ABBREVIATIONS

<b>ASGISA:</b>	Accelerated Shared Growth Initiative for South Africa
<b>BBBEE:</b>	Broad Based Black Economic Empowerment
<b>BID:</b>	Background Information Document
<b>BPEO:</b>	Best Practice Environmental Option
<b>CARA:</b>	Conservation of Agricultural Resources Act
<b>CES:</b>	Coastal and Environmental Services
<b>CITES:</b>	Convention on International Trade in Endangered Species
<b>DAFF:</b>	Department of Agriculture, Forestry and Fisheries
<b>DEA:</b>	Department of Environmental Affairs
<b>DEAT:</b>	Department of Environmental Affairs and Tourism (now DEA)
<b>DMS:</b>	Degrees, Minutes, Seconds
<b>DSR:</b>	Draft Scoping Report
<b>DWA:</b>	Department of Water Affairs
<b>EAP:</b>	Environmental Assessment Practitioner
<b>ECO:</b>	Environmental Control Officer
<b>EIA:</b>	Environmental Impact Assessment
<b>EIR:</b>	Environmental Impact Report
<b>EMPr:</b>	Environmental Management Programme
<b>FSR:</b>	Final Scoping Report
<b>GDP:</b>	Gross Domestic Product
<b>GNR:</b>	Government Notice Regulation
<b>ha:</b>	Hectare
<b>I&amp;APs:</b>	Interested and Affected Parties
<b>IBA:</b>	Important Bird Area
<b>IDP:</b>	Integrated Development Plan
<b>IPP:</b>	Independent Power Producer
<b>IUCN:</b>	International Union for the Conservation of Nature
<b>Kv:</b>	Kilovolt
<b>MW:</b>	Mega Watts
<b>NEMA:</b>	National Environmental Management Act 107 of 1998
<b>NERSA:</b>	National Energy Regulator of South Africa
<b>PGDS:</b>	Provincial Growth and Development Strategy
<b>PoS:</b>	Plan of Study
<b>PNCO:</b>	Provincial Nature Conservation Ordinance
<b>PPA:</b>	Power Purchase Agreement
<b>PPP:</b>	Public Participation Process
<b>RDB:</b>	Red Data Book
<b>REFIT:</b>	Renewable Energy Feed In Tariff
<b>REPA:</b>	Renewable Energy Purchasing Agency
<b>SABAP2:</b>	South African Bird Atlas Project 2
<b>SSC:</b>	Species of Special Concern
<b>STEP:</b>	Sub-tropical Thicket Ecosystem (Planning) Project
<b>WfW:</b>	Working for Water



## **INTRODUCTION**

### **1.1 Background to the study**

Plan 8 (Pty) Ltd, a renewable energy company, plans to develop a wind powered electricity generation facility (known as a 'wind farm') approximately 30 kilometres outside of Grahamstown along the N2 in an easterly direction towards East London, in the Eastern Cape Province of South Africa. The proposed site is on the farms Gilead, Tower Hill and Peynes Kraal. The project area lies in the Makana Local Municipality's area of jurisdiction. The proposed wind farm is planned to comprise up to a maximum of 27 turbines, each with a nominal power output ranging between 2 and 3 MW (megawatts). The total potential generating capacity of the wind farm will be approximately 67.5 MW, and will feed power into the national electricity transmission grid. In accordance with the requirements of the National Environmental Management Act No. 107 of 1998 as amended, and relevant Environmental Impact Assessment (EIA) regulations made in terms of this Act (Government Notice No R.543) and promulgated in 2010, the proposed project requires a full Scoping and EIA. Coastal & Environmental Services (CES) have been appointed by Plan 8 (Pty) Limited as Environmental Assessment Practitioner (EAP) to conduct the EIA.

### **1.2 The Environmental Impact Assessment Process**

The International Association for Impact Assessment (1999) defines an Environmental Impact Assessment (EIA) as, "the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made." The EIA process in South Africa is guided by regulations made in terms of Chapter 5 of NEMA. The EIA regulations (Government Notice R. 543) set out the procedures and criteria for the submission, processing and consideration of and decisions on applications for the environmental authorisation of activities. Three lists of activities, published on 02 August 2010, as Government Notice Numbers R.544 to 546, the first two of which define the activities that require, respectively, a Basic Assessment (applies to activities with limited environmental impacts), or a Scoping and Environmental Impact Assessment (applies to activities which are significant in extent and duration). A third Government Notice, Number R.546, is province specific, and lists activities for which environmental authorisation is required if the activities take place in or in the vicinity of certain specified areas, including estuaries, protected or sensitive areas, and areas listed in international conventions such as the Ramsar Convention on Wetlands. The activities triggered by the proposed development are listed in Table 1-1 below.

**Table 1-1: Listed activities potentially triggered by the proposed Plan 8 Grahamstown Wind Energy Project**

Number and date of the relevant notice	Activity No(s)	Describe each listed activity
Listing Notice 1: R.544	10	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; (ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.
Listing Notice 1: R.544	11	The construction of: (xii) canals; (xiii) channels; (xiv) bridges; (xv) dams; (xvi) weirs; (xvii) bulk storm water outlet structures; (xviii) marinas; (xix) jetties exceeding 50 square metres in size; (xx) slipways exceeding 50 square metres in size; (xxi) buildings exceeding 50 square metres in size; or (xxii) infrastructure or structures covering 50 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.
Listing Notice 1: R.544	13	The construction of facilities or infrastructure for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 but not exceeding 500 cubic metres;
Listing Notice 1: R.544	18	The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock or more than 5 cubic metres from: (i) a watercourse; (ii) the sea; (iii) the seashore; (iv) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater- but excluding where such infilling, depositing, dredging, excavation, removal or moving; (c) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or (d) occurs behind the development setback line.

Listing Notice 1: R.544	38	The expansion of facilities for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.
Listing Notice 1: R.544	40	The expansion of (iv) jetties by more than 50 square metres; (v) slipways by more than 50 square metres; or (vi) buildings by more than 50 square metres (iv) infrastructure by more than 50 square metres within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, but excluding where such expansion will occur behind the development setback line.
Listing Notice 1: R.544	47	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre- (iii) where the existing reserve is wider than 13,5 meters; or (iv) where no reserve exists, where the existing road is wider than 8 metres – excluding widening or lengthening occurring inside urban areas.
Listing Notice 2: R.545	1	The construction of facilities or infrastructure for the generation of electricity where the electricity is 20 megawatts or more.
Listing Notice 2: R.545	8	The construction of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.
Listing Notice 2: R.545	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; Except where such physical alteration takes place for: (iii) linear development activities; or (iv) agriculture or afforestation where activity 16 in this Schedule will apply.
Listing Notice 3: R.546	4	The construction of road wider than 4 metres with a reserve less than 13,5metres.
Listing Notice 3: R.546	10	The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.
Listing Notice 3: R.546	12	The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation
Listing Notice 3: R.546	13	The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation:
Listing Notice 3: R.546	14	The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation

Listing Notice 3: R.546	16	The construction of (iv) infrastructure covering 10 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line
Listing Notice 3: R.546	19	(19) The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.
Listing Notice 3: R.546	24	The expansion of (d) infrastructure where the infrastructure will be expanded by 10 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.

Because the proposed development triggers a listed activity from GNR.545, it will require a full Scoping and EIA. This process is regulated by Chapter 3, Part 3 of the EIA regulations and is illustrated in Figure 1-1. It is described in further detail in Appendix A of this report.

The competent authority that must consider and decide on the application for authorisation in respect of the activities listed in Table 1-1 is the Department of Environmental Affairs (DEA), formerly the Department of Environmental Affairs and Tourism (DEAT), as the Department has reached agreement with all Provinces that all electricity-related projects, including generation, transmission and distribution, are to be submitted to DEA, irrespective of the nature of the applicant. This decision has been made in terms of Section 24(C)(3) of the NEMA (Act No 107 of 1998). The decision is effective for all projects initiated before, and up until, approximately 2015.

It is important to note that, in addition to the requirements for an authorisation in terms of the NEMA, there may be additional legislative requirements which need to be considered prior to commencing with the activity, for example: the National Heritage Resources Act (Act No 25 of 1999), the National Water Act (Act No 36 of 1998), the Civil Aviation Act (Act No 74 of 1962) as amended, the White Paper on Energy Policy for South Africa (Energy White Paper), the White Paper on Renewable Energy Policy (Renewable Energy White Paper), and the Integrated Energy Plan for the Republic of South Africa (March, 2003) etc.

**Scoping Phase**

The main aim of the scoping process of an EIA is to inform the public of the proposed project and EIA process as well as to identify issues and concerns that need to be addressed in the Environmental Impact Assessment (EIA) phase of the EIA process. The Scoping phase therefore has the following key objectives:

- To encourage and allow for the involvement of Interested and Affected Parties (I&APs) in the identification of issues;
- To identify reasonable alternatives;
- To ensure that all key issues and environmental impacts that will be generated by the proposed project are identified; and
- To identify any Fatal Flaws.

The full involvement of Interested and Affected Parties (I&APs) in the process ensures an open participatory approach to the study. It also ensures that all the impacts are identified and that planning and decision-making are done in an informed, transparent and accountable manner.

The Scoping phase for the proposed Plan 8 Grahamstown Wind Energy Project took place between September 2011 and February 2012. The Draft Scoping Report was distributed to I&APs

for comment for a period of 40 days between the 3<sup>rd</sup> of November 2011 and the 13<sup>th</sup> of December 2011. A detailed description of the Scoping phase for the proposed Plan 8 Grahamstown Wind Energy Project and the outcomes thereof are included in Volume 1: "*Final Environmental Scoping Report: Proposed Plan 8 Grahamstown Wind Energy Project, Makana Municipality*" (CES, January 2012) and is therefore not discussed further here. Comments and the appropriate responses were included in the Final Scoping Report (FSR) which was submitted to the competent authority on the 20<sup>th</sup> of January 2012 and acknowledged by the DEA as being received on the 26<sup>th</sup> of January 2012 (see Appendix B).

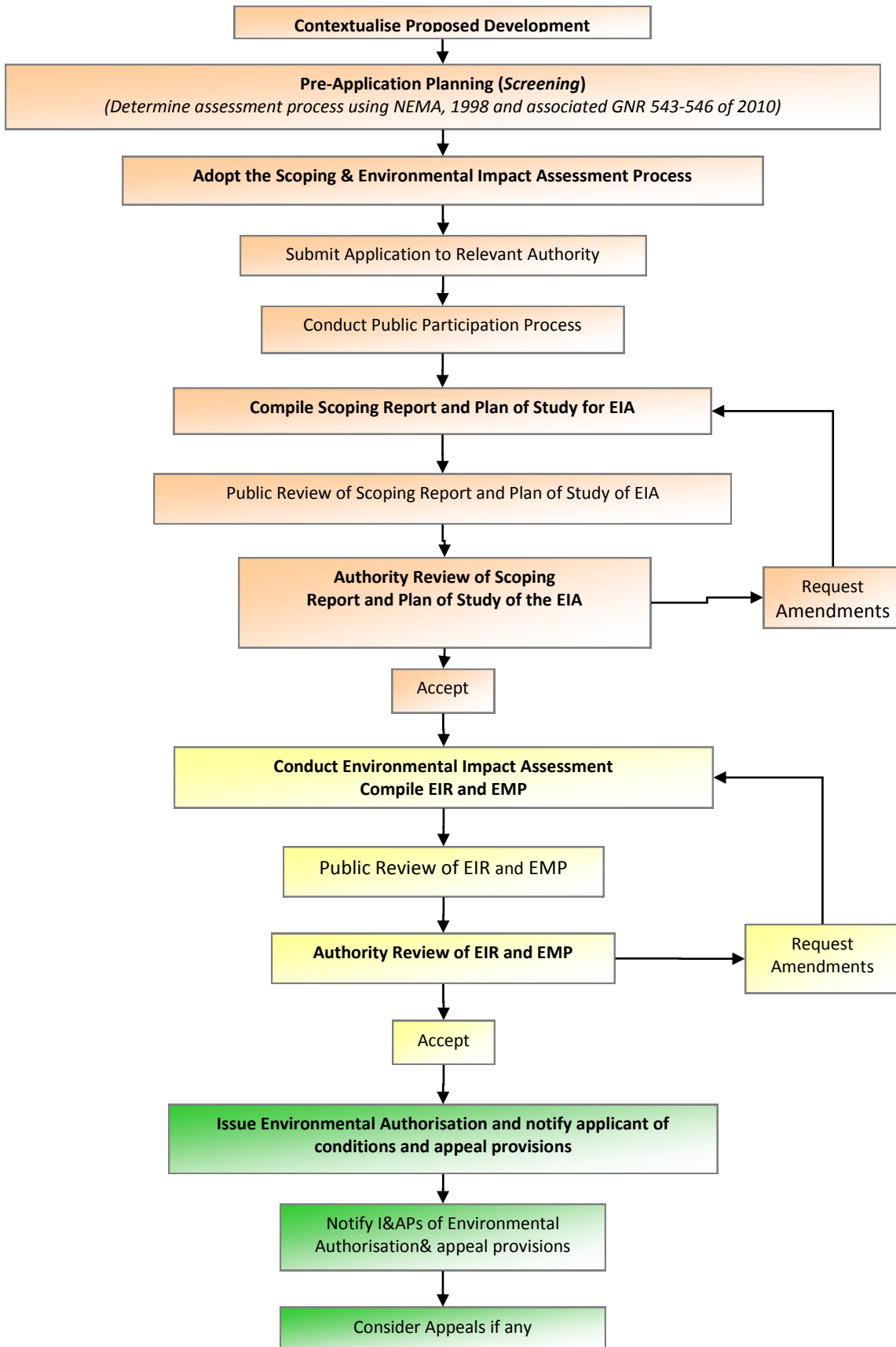


Figure 1-1: The EIA process under current legislation (NEMA 1998) as amended

\* Scoping Phase (orange), Environmental Impact Assessment Phase (yellow), and Environmental Authorisation Phase (green).

A Plan of Study (PoS) for the detailed EIR phase was also submitted together with the FSR. This was in fulfilment of section 28 (1) (n) of the EIA regulations (2010) which states that, “A *Plan of Study for environmental impact assessment which sets out the proposed approach to the environmental impact assessment of the application, must be submitted and it must include –*

- (i) *A description of the tasks that will be undertaken as part of the environmental impact assessment process, including any specialist reports or specialised processes, and the manner in which such tasks will be undertaken;*
- (ii) *An indication of the stages at which the competent authority will be consulted;*
- (iii) *A description of the proposed method of assessing the environmental issues and alternatives, including the option of not proceeding with the activity; and*
- (iv) *Particulars of the public participation process that will be conducted during the environmental impact assessment process.*

A copy of the PoS was submitted to DEA as part of the Final Scoping Report. The DEA has approved the FSR and PoS (24 February 2012), and advised the EAP in terms of Regulation 31(1) to, “*proceed with the environmental impact assessment process in accordance with the tasks contemplated in the plan of study for environmental impact assessment*” i.e. the detailed EIA phase (Appendix A). CES released the Draft EIR for public review according to the aforementioned approval. The EIR has now been finalised and is presented here.

### ***Environmental Impact Assessment Phase***

The EIA phase follows directly from the Scoping phase and has now been completed. The aim of the detailed EIA phase was to undertake a comprehensive evaluation and study that addressed all the issues raised during Scoping and produce a report that contains all the relevant information that is necessary for the competent authority to consider the application and to reach a decision contemplated in Regulation 35. More specifically, the EIA phase has seven key objectives:

- Describe the biophysical and socio-economic environment that is likely to be affected by the proposed development.
- Undertake specialist studies to address the key biophysical and socio-economic issues.
- Assess the significance of impacts that may occur from the proposed development.
- Assess the alternatives proposed during the Scoping Phase.
- Provide details of mitigation measures and management recommendations to reduce the significance of impacts.
- Provide a framework for the development of an Environmental Management Programme (EMPr).
- Continue with the public participation process.

This EIA phase includes the following steps -

1. **Specialist Studies**, which include the specialist assessments identified in the FSR and any additional studies required by the authorities. This requires the appointment of specialists to gather baseline information in their fields of expertise, and to assess the impacts and make recommendations to mitigate negative impacts and optimise benefits. The resulting information is synthesised into the Environmental Impact Assessment Report (EIR).
2. **Environmental Impact Assessment Report**. The main purpose of this report is to gather and evaluate environmental information, so as to provide sufficient supporting arguments to evaluate overall impacts, consider mitigation measures and alternative options, and make a value judgement in choosing the best development alternative. The EIR is made available for public and authority review. The availability of the report is advertised in at least one Provincial newspaper and a copy of the report is placed at an easily accessible location.
3. **Comments Report**, which compiles comments, issues and concerns raised by I&APs and the authorities and the relevant responses to these comments.

4. **Environmental Management Programme**, which informs the client, technical team and contractor of the guidelines which will need to be followed during construction and operation to ensure that there are no lasting or cumulative negative impacts of these processes on the environment.

### ***Procurement Process -Independent Power Producers***

Under the Department of Energy's current procurement policy for renewable energy, Independent Power Producers (IPPs) have to comply with the requirements as detailed in the Request for Proposal (RFP) document that was released in August 2011. The RFP document underpins five rounds of a competitive bid process to which a total of 1850 MW of power has been allocated. The first round of bid submissions were made in November 2011 and March 2012, while subsequent windows are August 2012, March 2013 and finally August 2013.

In what is effectively a substantial vetting process, IPPs are required to meet the minimum requirements set out in five volumes of the RFP document covering legal, technical (of which the EIA process forms a part), financial and economic development criteria. A critical imperative of the procurement process is that all successful projects are operational by 2016. Over and above the necessary environmental authorisation for a project the aspects listed below also require review and the associated application, reporting and permitting processes to be conducted as part of the bid process.

### ***Heritage***

In terms of the National Heritage Resources Act (25 of 1999) the protection of archaeological and paleontological resources is the responsibility of a provincial (or national) heritage resources authority. All archaeological objects, paleontological material and meteorites are the property of the State. Where necessary the relevant permits need to be secured prior to project development. It is not applicable in this instance owing to the lack of heritage features of significance in the project study area. Regardless, copies of the EIR have been sent to the Eastern and Western Cape authorities for comment owing to a lack of capacity in the Eastern Cape offices to engage in these processes. Comment has been received from SAHRA and is attached in Appendix B. Mitigation measures suggested by SAHRA have been incorporated into the EMP.

### ***Water***

Section 21 of the National Water Act (36 of 1998) defines various uses or activities that require the issuing of the relevant water use license, or general authorisation process, to be conducted for all projects whose activities trigger these. This relates to engineering structures constructed in watercourses for road access, abstraction of water in the construction or operational phases, etc. Section 21 (c) and (i) authorisations are needed whenever new roads and/or cables cross watercourses (even dry headwaters), and when upgrades to existing causeways/bridges (e.g. to allow transportation of long/heavy components and equipment) are required: This is defined as a "water use" in terms of the Act. The process of obtaining a Water Use Authorisation begins with an inception phase review and preliminary application. The purpose of this phase is to:

- a) undertake a site visit to determine the number of crossings likely to require Section 21 (c) and (i) authorisation,
- b) introduce the relevant DWA officials to the project at an early stage, and to
- c) find out from them (based on the site visit and the initial findings of the Scoping Report) whether the water uses can be authorised in terms of a General Authorisation (appropriate when the impacts of the crossings are collectively low) or if a licence submission will be required (appropriate when there is greater ecological sensitivity).

For this project, the turbines and associated infrastructure have been designed so that no water use licences or general authorisations will be required. Cognisance of drainage lines and wetlands were taken when considering the layout submitted in this EIR. A non-binding commitment was



received from DWA stating that the water demand for construction and operational purposes could be accommodated from existing sources.

### **Civil Aviation Authority (CAA)**

Section 14 of Aviation Act (Act No. 74 of 1962) - through the 13th Amendment of the Civil Aviation Regulations 1997 - deals with obstacle limitations and markings outside of aerodromes or heliports. The Act specifically deals with wind turbine generators (wind farms) and the requirements that they need to adhere to, to be approved by the CAA. All necessary permits will be procured from the CAA for the proposed facility. The CAA has granted conditional approval, final approval to be given pending the final site layout plan.

### **Agriculture**

In terms of the Conservation of Agricultural Resources Act (43 of 1983) and the Subdivision of Agricultural Land Act (70 of 1970) all projects that impact on agricultural resources require at least comment from the national and/or provincial agriculture departments. When agricultural land is being subdivided, authorisation is required. Since subdivision will not be done for this project, only comment is required. Comment has been received from the Department of Agriculture, Forestry and Fisheries (DAFF) and a copy of the letter is included in Appendix B. In addition to this, the rezoning of land is dealt with in a separate application where the DAFF is a commenting authority.

## **1.3 The Environmental Assessment Practitioner**

**In terms of Section 31 (2) of the EIA Regulations (2010), an environmental impact assessment report must include-**

**(a) The details of -**

- (i) The EAP who compiled the report; and**
- (ii) The expertise of the EAP to carry out an environmental impact assessment.**

In fulfillment of the above-mentioned legislative requirement, as well as Section 17 of the EIA Regulations (2010) which states that, “an EAP must have expertise in conducting environmental impact assessments, including knowledge of the Act, these Regulations and any guidelines that have relevance to the proposed activity”, provided below are the details of the Environmental Assessment Practitioner (EAP) that prepared this Environmental Impact Assessment Report (EIR) as well as the expertise of the individual members of the study team.

### **Details of the EAP**

Coastal and Environmental Services (CES)

Physical Address: 67 African Street, Grahamstown 6139

Postal Address: P.O. Box 934, Grahamstown 6140

Telephone: +27 46 622 2364

Fax: +27 46 622 6564

Website: [www.cesnet.co.za](http://www.cesnet.co.za)

Email: [info@cesnet.co.za](mailto:info@cesnet.co.za)

### **Expertise of the EAP**

CES is one of the largest specialist environmental consulting firms in southern Africa. Established in 1990, and with offices in Grahamstown and East London, we primarily specialise in assessing the impacts of development on the natural, social and economic environments. CES's core expertise lies in the fields of strategic environmental assessment, environmental management

plans, environmental management systems, ecological/environmental water requirements, environmental risk assessment, environmental auditing and monitoring, integrated coastal zone management, social impact assessment and state of environment reporting.

Provided below are short *curriculum vitae* (CVs) of each of the team members involved in the proposed Plan 8 Grahamstown Wind Energy Project EIA.

**Mr. Bill Rowston (*Project Leader*)**

Bill graduated from the University of Salford, England, with a first class honours degree in civil engineering in 1971, after which he worked for more than 36 years in the English and South African water sectors. He spent 24 years with the Department of Water Affairs and Forestry in South Africa where, as a hydraulics specialist, he contributed to the development of approaches for protecting water resources, including the determination of the ecological Reserve of South Africa's National Water Act. Bill was closely involved with the development of the National Water Policy (1997) and the National Water Act (1998), and was responsible for compiling the National Water Resource Strategy, First Edition (2005), much of which he wrote. He also supervised the development of guidelines for the preparation of sub-national catchment management strategies. He joined CES in April 2007, where, in addition to managing a number of environmental impact assessments, he has co-authored a Technical Report on the determination and implementation of environmental water requirements for the Ramsar Convention on Wetlands and coordinated the determination of the riverine impacts of a proposed peaking hydroelectric power station in Zambia. He has contributed to the development of a new national water law for Vietnam, South Africa's National Groundwater Strategy, and catchment management strategies in South Africa.

**Mr Jadon Schmidt (*Project Manager and Report Production*)**

Jadon is a Senior Environmental Consultant and holds a BSc degree in Geology and Botany, a BSc Honours degree in Botany (both from NMMU) and an MBA from Rhodes University with a core environmental management and sustainability focus. His MBA thesis addressed resource economic issues of marine protected areas. He is currently completing an MSc in estuarine ecology dealing specifically with sea level rise impacts on sediment and vegetation dynamics. Climate change, wetland ecology, renewable energy and resource economics are among his professional interests. Jadon is currently project manager / team member for a number of wind energy and industrial development projects in South Africa and Sierra Leone.

**Ms Amber Jackson (*Report Production, Public Participation*)**

Ms Amber Jackson, Environmental Consultant, has an MPhil in Environmental Management from the University of Cape Town. Topics covered included environmental management theory, social and ecological systems, climate change and environmental law. With a dissertation in food security that investigated the complex food system of soft vegetables produced in the Philippi Horticultural Area and the soft vegetables purchased at different links, both formal and informal, in the food system. Prior to this she obtained a BSc degree in Zoology and 'Ecology, Conservation and Environment' and a BSc (Hons) in 'Ecology, Conservation and Environment' from the University of the Witwatersrand. Her honours thesis title was: Landscape Effects on the Richness and Abundance of the Herpeto fauna in the Kruger National Park.

**Ms Leigh-Ann DeWet (*Ecological Specialist and Report Production*)**

Leigh-Ann holds a BSc (Botany and Entomology) as well as a BSc (Hons) and MSc in Botany from Rhodes University. She conducts vegetation sensitivity assessments, to guide developments and thereby minimising their impacts on sensitive vegetation.

**Table 1-2: The Specialists involved in the EIA Phase**

Specialist Study	Affiliation	Name of Lead Specialist(s)
Noise	Safetech	Mr Brett Williams
Heritage	Nilssen Archaeological Resources Management	Mr Peter Nilssen
Avifauna	Endangered Wildlife Trust	Mr Jon Smallie
Visual	MapThis	Mr Henry Holland
Ecological	Coastal and Environmental Services	Prof. Roy Lubke
		Ms. Leigh-Ann De Wet
Bat (Chiroptera)	Animalia Zoological and Ecological Consultation	Mr Werner Marais
Palaeontological	Rob Gess Consulting	Dr Rob Gess
Agricultural	Isi-iXwiba Consulting	Mr Chris Bradfield

### The Environmental Impact Report

In accordance with regulation 31 (2) of the EIA Regulations (2010) which states that, “*an environmental impact assessment report must contain all information that is necessary for the competent authority to reach a decision contemplated in terms of regulation 35 - Decisions on applications*”, the overall purpose of the EIR is to communicate the findings of the EIA to the authorities in order to inform the decision as to whether or not to authorise the proposed project.

More specifically, the objectives of the EIR are to -

- Confirm which issues have been investigated further and addressed in the EIR;
- Identify and assess impacts of feasible alternatives within the development proposal;
- Provide a comprehensive assessment of predicted impacts that may result from the proposed project, in accordance with the specified impact assessment methodology;
- Where alternatives have been assessed, make recommendations for the best practice environmental option (BPEO);
- Recommend actions to mitigate negative impacts or enhance benefits; and
- Provide recommendations for monitoring programmes.

This report is the third of four reports produced for this EIA process.

This EIR has been produced in accordance with the requirements of Section 31 (2) of the EIA regulations (GNR 543), which clearly outlines the content of environmental impact assessment reports.

Sections 54-57, which cover the activities necessary for a successful Public Participation Process (PPP), have also been adhered to.

### Nature and Structure of this Report

In accordance with the EIA Regulations (2010), an EIA report must contain all the information that is necessary for the competent authority to consider the application and to reach a decision and must include those points laid out in Table 1-3. In order to facilitate review by the competent authority, this report, which forms Volume 3 of the suite of EIA documents related to the proposed project, is structured around these requirements.

**Table 1-3: EIA regulation requirements and structure of the report**

<b>EIA Regulation Requirements</b>	<b>Section/Chapter</b>
Details of the Environmental Assessment Practitioner (EAP) and their expertise	Section 1.3
A detailed description of the proposed activity	Chapter 2
A description of the property on which the activity is to be undertaken and the location of the activity on the property	Chapter 2
A description of the environment that may be affected by the activity and the manner in which it may be affected	Chapter 3
Details of the public participation process conducted including a register of I&APs and a comprehensive Issues and Response Trail	Appendix C
A description of the need and desirability of the proposed activity	Chapter 4
Identification of potential alternatives to the proposed activity	Chapter 5
An indication of the methodology used in determining the significance of potential environmental impacts	Appendix A
A description and comparative assessment of alternatives	Chapter 7
A summary of the findings and recommendations of specialist reports.	Chapter 8
A description of all environmental issues, an assessment of the significance of each issue and an indication of the extent to which the issue could be addressed by the adoption of mitigation measures	Chapter 7
A description of any assumptions, uncertainties and gaps in knowledge	Chapter 1
An opinion as to whether the activity should or should not be authorised	Chapter 8
An environmental impact statement which contains a summary of the findings and a comparative assessment of the positive and negative implications.	Chapter 8
Environmental Management Programme (EMPr)	Volume 4
Copies of the Specialist Reports	Volume 2
Any additional information that may be required by the competent authority.	Appendices

In line with Table 1-3, the structure of this report is therefore as follows:-

**Chapter 1 - Introduction:** Provides background information on the proposed project, a brief description of the EIA process required by NEMA and its regulations, and describes the key steps

in the EIA process that have been undertaken. The details and expertise of the Environmental Assessment Practitioner (EAP) who compiled this report are also provided in this Chapter.

**Chapter 2 – Project Description:** Provides a detailed description of the proposed development, the property on which the development is to be undertaken and the location of the development on the property. The technical details of the process to be undertaken are also provided in this Chapter.

**Chapter 3 – Description of the Affected Environment:** Provides a description of the environment that may be affected by the proposed activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity.

**Chapter 4 – Need and Desirability:** Provides a description of the need and desirability of the proposed.

**Chapter 5 – Alternatives:** Provides a description of the alternatives to the proposed development or parts of the proposed development.

**Chapter 6 – Key Findings of the Specialist Studies:** This Chapter summarises the findings of the specialist studies which are included in detail in *Volume 2: Proposed Plan 8 Grahamstown Wind Energy Project: Specialist Reports* (CES, January 2012).

**Chapter 7 – Assessment of Impacts:** Provides:-

- A description of all environmental issues relating to all phases of the proposed development that were identified during the EIA process, an assessment of the significance of each issue and an indication of the extent to which the issue could be addressed by the adoption of mitigation measures.
- An assessment of each identified potentially significant impact, including –
  - i. Cumulative impacts;
  - ii. The nature of the impact;
  - iii. The extent and duration of the impact;
  - iv. The probability of the impact occurring;
  - v. The degree to which the impact can be reversed;
  - vi. The degree to which the impact may cause irreplaceable loss of resources; and
  - vii. The degree to which the impact can be mitigated.

**Chapter 8 – Conclusions and Recommendations:** Provides -

- An opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.
- An environmental impact statement which contains –
  - i. A summary of the key findings of the environmental impact assessment; and
  - ii. A comparative assessment of the positive and negative implications of the proposed activity and identified alternatives.
  - iii. Recommended further study and assessment.

**References:** Cites any texts referred to during preparation of this report.

**Appendix A** - The Environmental Impact Assessment Process and methodology for assessing impacts.

**Appendix B** - Copies of correspondence received from authorities.

**Appendix C** - Plan of Study approval from DEA.

**Appendix D** - Details of the Public Participation Process, including I&AP list and comprehensive I&R Trail.

**Appendix E** - Copies of title deeds.

**Appendix F** - Letter from DWA confirming availability of water during the construction phase.

### **Volume 1 – Final Scoping Report**

**Volume 2 - Specialist Reports:** Provides copies of any specialist reports and reports on specialised processes complying with Regulation 32 of the EIA Regulations (GNR 543).

**Volume 4 - Environmental Management Programme:** Provides an Environmental Management Programme (EMPr) that complies with Regulation 33 of the EIA Regulations (GNR 543).

### **Assumptions and limitations**

This report is based on currently available information and, as a result, the following limitations and assumptions are implicit in it: –

- Descriptions of the natural and social environments are based on fieldwork augmented by available literature.
- The originally proposed locations of the turbines (in the Draft Scoping Report) were adjusted to account for the recommendations made during the scoping phase. Further recommendations are made in the specialist reports based on studies carried out during the EIA phase. Should environmental authorisation be granted the layout will be subject to further refinement - micro-siting – to account for site-specific geotechnical conditions, the results of the bird and bat monitoring programmes, and detailed vegetation surveys.
- The final turbine layout will be contained within the property boundaries of the study area.

## PROJECT DESCRIPTION

In terms of Section 31 (2) of the EIA Regulations (2010), *an environmental impact assessment report must include-*

- (b) A detailed description of the proposed activity;*
- (c) A description of the property on which the activity is to be undertaken and the location of the activity on the property.....*

In line with the above-mentioned regulatory requirement this chapter identifies the location and size of the site of the proposed Plan 8 Grahamstown Wind Energy Project, and provides a description of its various components and arrangements on the site.

### 2.1 Location and site description of the proposed development

The proposed Plan 8 Grahamstown Wind Energy Project is to be constructed on approximately 2,550 hectares (ha) encompassing the farms described in the table below.

**Table 2-1: Erf numbers that comprise the farms proposed for Plan 8 Grahamstown Wind Energy Project**

Farm Name	Erf Numbers	Surveyor General 21 digit code
Gilead	No361, Division of Albany	C 00200000000036100000
Tower Hill	Coombs Vale farm No 3, Division of Albany	C 00800000000000300001
Peynes Kraal	No 362, Division of Albany	C 00200000000036200000

It should be noted that the cumulative development footprint for the project will be a relatively minor proportion of this total extent, as each turbine has a final (operational) disturbance footprint of approximately 0.2ha (2,000 square metres) .The footprint comprises access roads, crane pads and turbine footings.

### 2.2 Detailed description of the Plan 8 Grahamstown Wind Energy project

The term “wind energy” describes the process by which wind is used to generate mechanical power or electricity. Wind turbines convert the kinetic energy in the wind into mechanical power and a generator can then be used to convert this mechanical power into electricity.

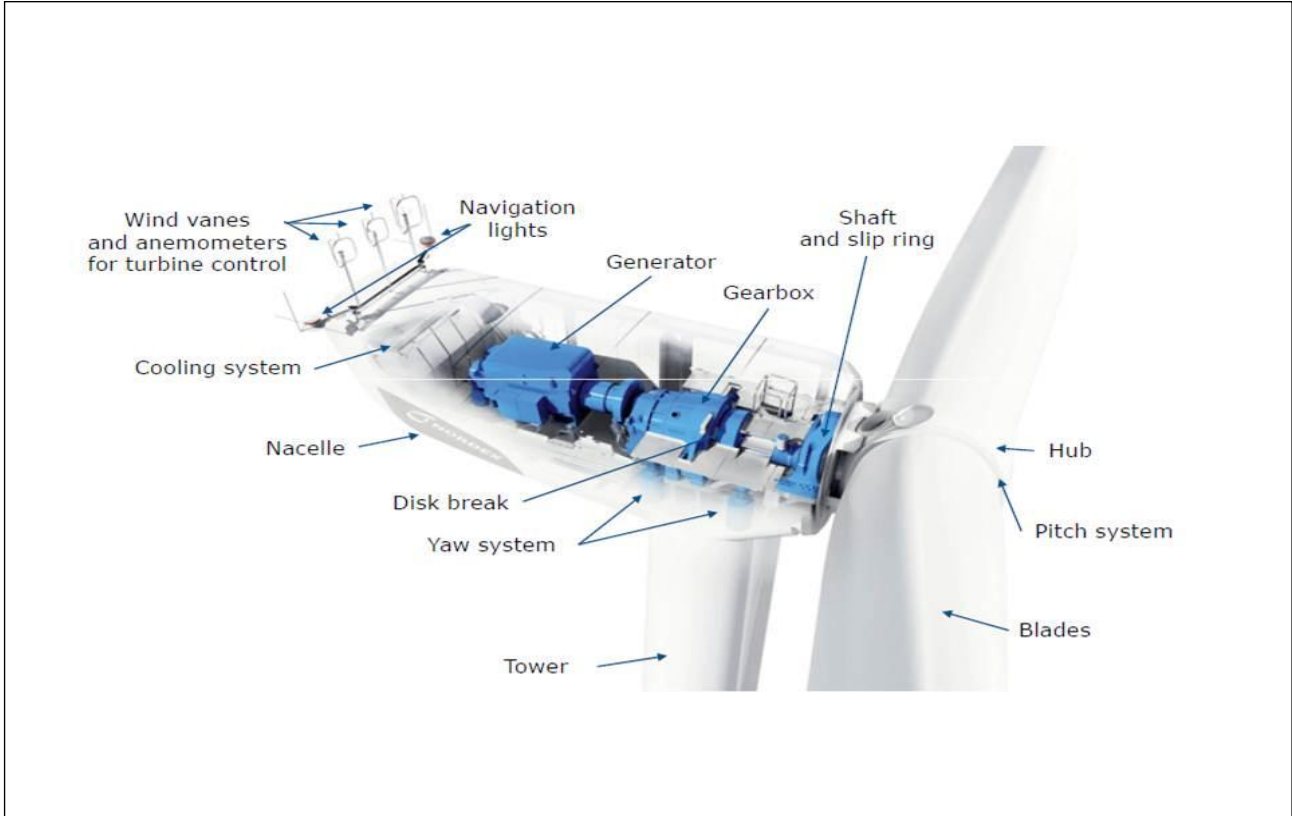
The Plan 8 Grahamstown Wind Energy Project will be spread over three properties in the Grahamstown area of Makana Local Municipality, and is planned to host a total of up to 27 turbines, each with a nominal power output of between 2 and 3 MegaWatts (MW).

The total potential output of the Wind Energy Project would therefore be approximately 67.5 MW, which will serve to further support the regional and national power balance.

The final number of turbines and their placement on the site has been informed by the specialist studies and assessment conducted for the EIA phase, and will be further refined to account for detailed wind resource assessment, site-specific geotechnical conditions, the results of the bird and bat monitoring programmes, and detailed vegetation surveys after environmental authorisation.

### 2.2.1 Turbine specifications

The ultimate size of the wind turbines will depend on further technical assessments but will typically consist of horizontal axis rotor turbines (3 x ±50m length blades) with rotor diameters of ±100 metres mounted atop a 80-100 metre high steel (or hybrid steel/concrete) tower. Other infrastructure components associated with the proposed wind energy facility are *inter alia*:



**Figure 2-1: Principal components within and attached to the nacelle**

- Rotor and blades

The rotor converts collected wind energy into rotational energy so as to turn the generator. The rotor has three blades that rotate at a constant speed, approximately 7.5 - 15 revolutions per minute (rpm) in the case of the turbines being considered for this facility. The rotor is pitch controlled. The blades are usually coloured light grey and, in the case of the proposed project, would be between 50 – 58.5 m long (100 - 117 m diameter).

- Nacelle

The nacelle is a fibre-glass housing for the generator, gearbox and control system (yaw and pitch). The speed of rotation of the blades is controlled inside the nacelle.

Larger wind turbines are typically actively controlled to face the wind direction measured by a wind vane situated on the back of the nacelle. By reducing the misalignment between wind and turbine pointing direction (yaw angle), the power output is maximised and non-symmetrical loads minimised. The nacelle can turn the blades to face into the wind ('yaw control').

All turbines are equipped with protective features to avoid damage at high wind speeds. By turning the blades into the wind ('furling') the turbine ceases its rotation, accompanied by both electromagnetic and mechanical brakes. This would typically occur at very high wind speeds, typically over 72 km/hr (20 m/s). The wind speed at which shut down occurs is called the cut-out



speed. The cut-out speed is a safety feature which protects the wind turbine from damage. Normal wind turbine operation usually resumes when the wind drops back to a safe level. Instrumentation and control devices inside the nacelle control the angle of the blades ('pitch control') to make optimal use of the available wind and avoid damage at high wind speeds.

The nacelle also contains the generator, control equipment, gearbox and wind speed measure (anemometer) in order to monitor the wind speed and direction (Figure 2.1).

- Generator

The generator converts the turning motion of the blades into electricity. A gear box is commonly used for stepping up the speed of the generator. Inside the generator, wire coils rotate in a magnetic field to produce electricity. Each turbine has a transformer located at the base of the turbine (outside) that steps up the voltage, in the case of the proposed project from 660 V to 33 or 22 kV, to match the line frequency and voltage for electricity evacuation/distribution

- Tower

The tower is constructed from tubular steel and supports the rotor and nacelle. For the proposed project the tower would be either 80 m, 91 m or 100 m tall, depending on the selected turbine. Wind has greater velocity at higher altitudes, therefore increasing the height of a turbine increases its ability to intercept greater wind speeds and produce more electricity.

- Foundation

Foundations are designed to factor in both weight (vertical load) and lateral wind pressure (horizontal load). Considerable attention is given when designing the foundations to ensure that the turbines are adequately grounded to operate safely and efficiently. The final foundation design of the proposed turbines is dependent on a geotechnical investigation; however; it is likely that the proposed turbine foundations would be made of reinforced concrete. The foundations would be approximately 20 m x 20 m and an average of 2 to 6 m deep. The foundation would be cast *in situ* and could be covered with top soil to allow vegetation growth around the 6 m diameter steel tower.

- Crane Hardstanding

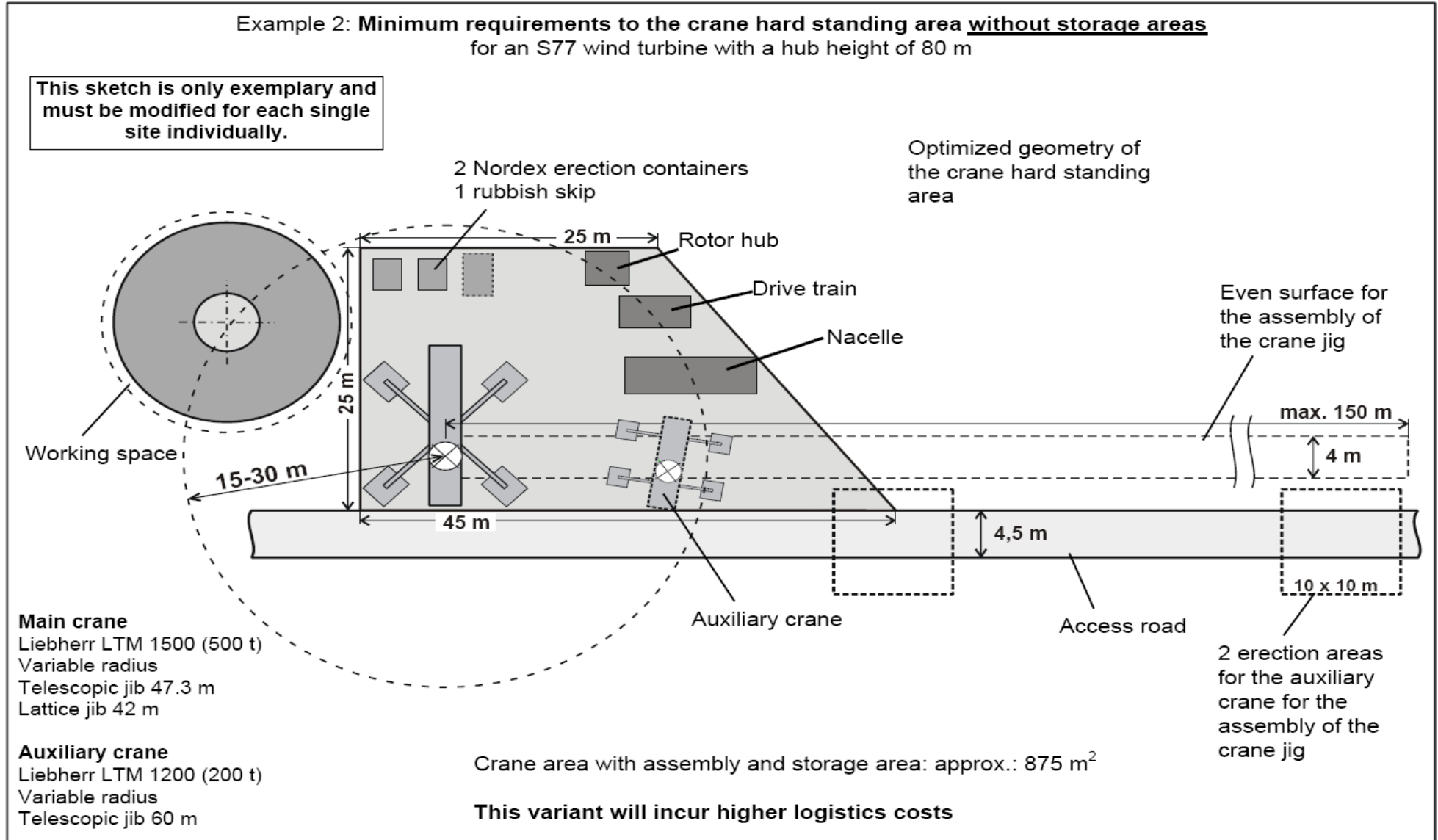
A hardstanding will be required adjacent to each Wind Turbine Generator (WTG) upon which to stand the crane used for erecting the tower, nacelle and rotor. Figure 2.2 specifies the minimum requirements for the turbines proposed for this facility.

### **2.2.2 Additional Infrastructure requirements**

In addition to the above, the following infrastructure will be required for the wind energy facility:

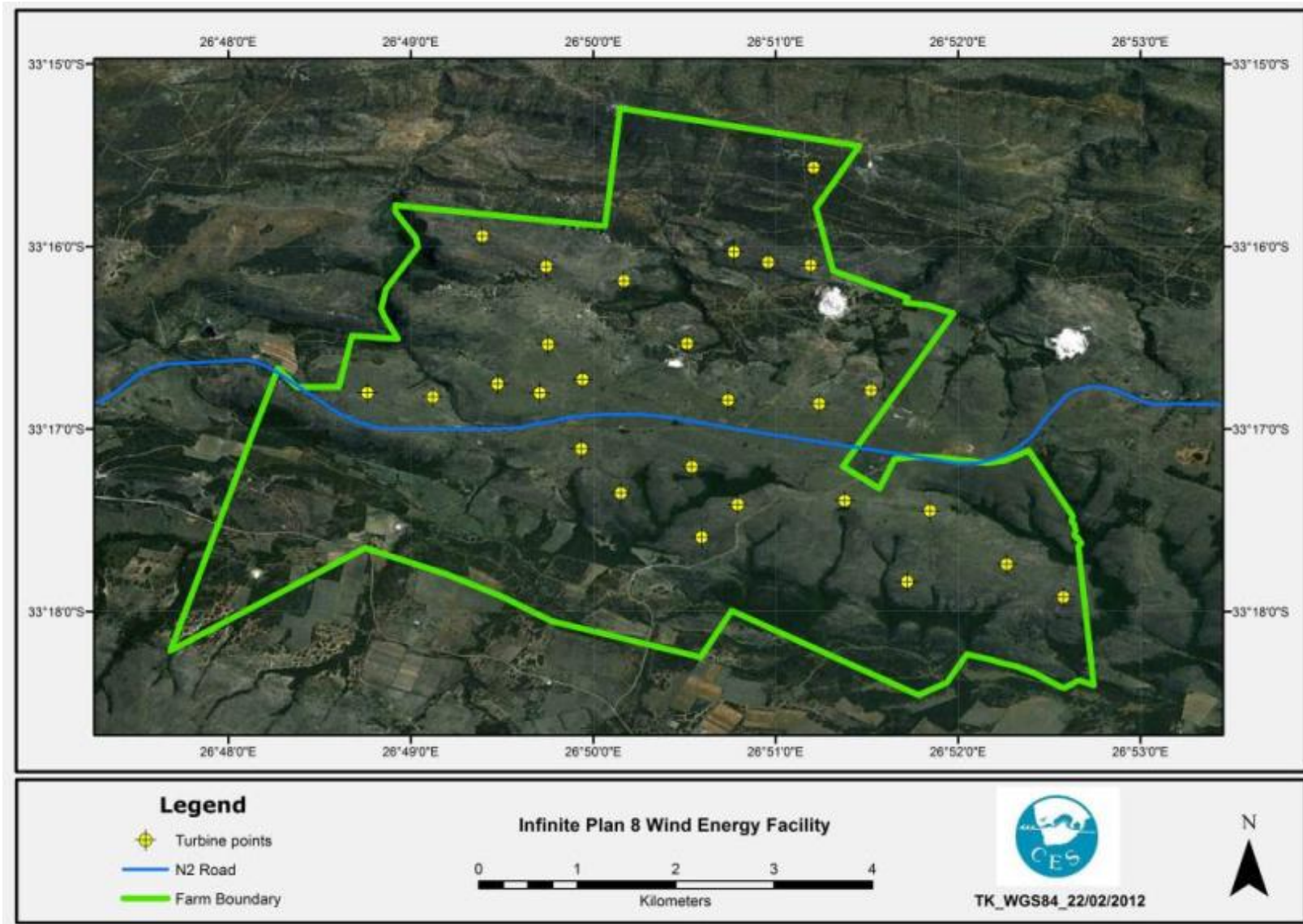
- Internal access roads
- Underground electricity reticulation cables connecting the wind turbines to one another;
- Existing and proposed 132 kilovolt (KV) overhead power lines traversing the farm;
- One sub-station will be constructed for the project to receive the generated power and transmit this to the point of interconnection; and
- Buildings to house the control instrumentation and backup power support. As well as a store room for the maintenance equipment.

The electricity will be fed into the national Eskom transmission grid.



**Figure 2-2: Illustration of the floor plan for the crane hardstanding area**

(Ref: Transport, Access Roads and Crane Requirements Nordex N80/2500, N90/2500, N100/2500 Version gamma, Nordex Energy GmbH, Bornbarch 2, 22848 Norderstedt, Germany, K0801\_011803\_EN Revision 02, 2009-12-04)



**Figure 2-3: Preliminary locality map indicating the location of the proposed Plan 8 Grahamstown Wind Energy Project.**  
*\*Please note: This layout was subject to specialist assessment and revised according to specialist recommendations.*



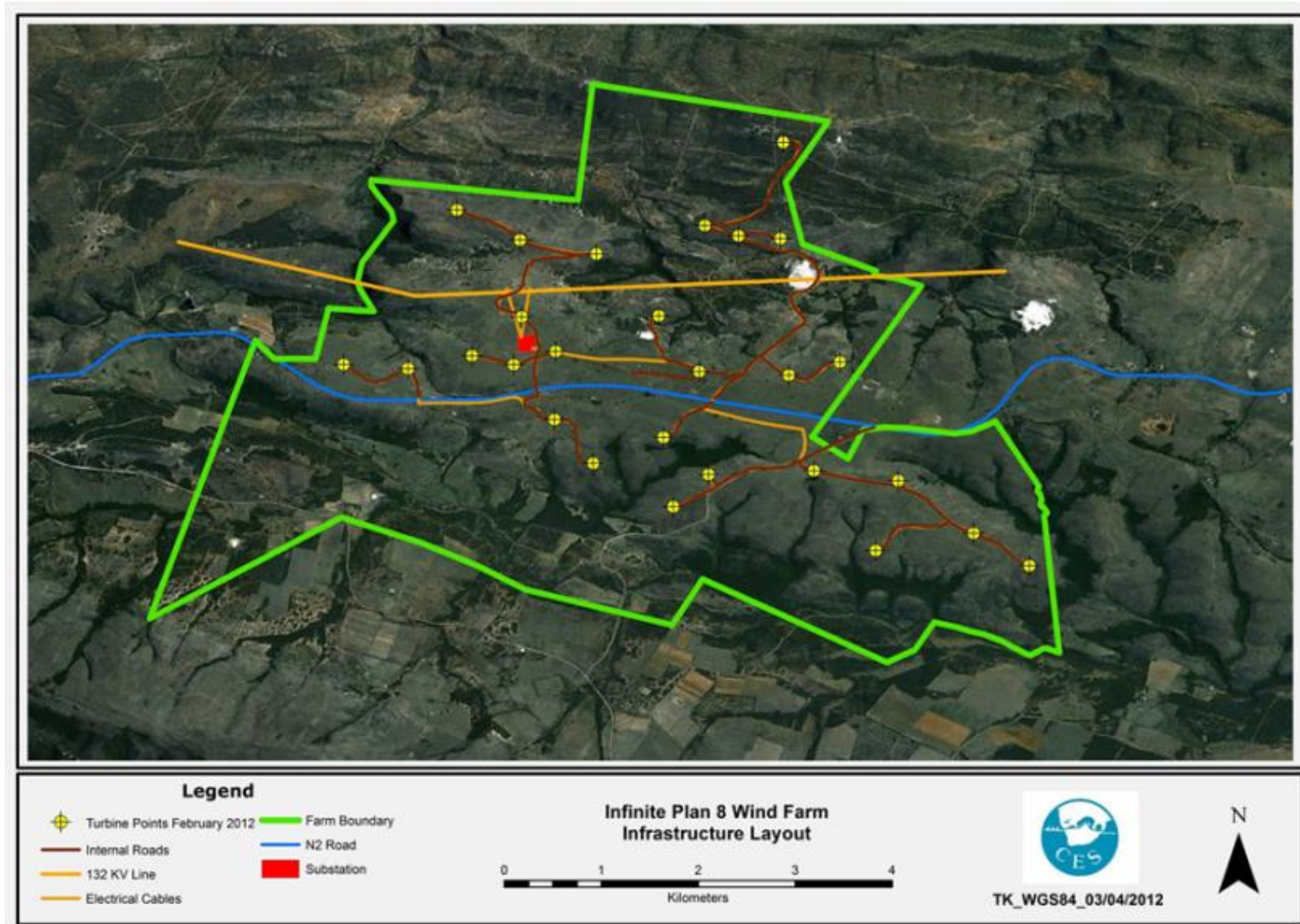


Figure 2-4: Preliminary site layout plan indicating turbines, roads, powerlines, substation and project cabling connections.

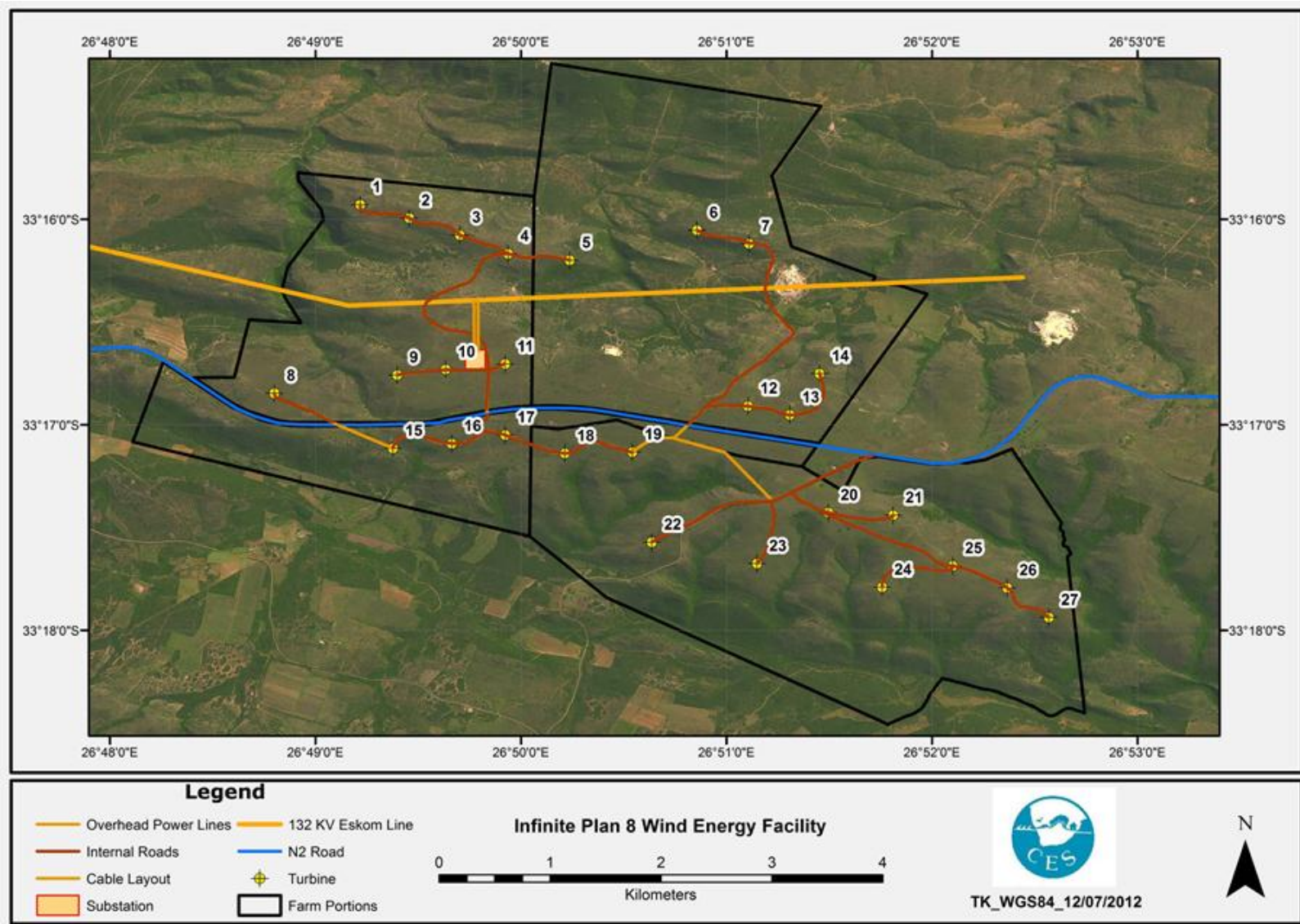


Figure 2-5: The final turbine and infrastructure layout, that has been developed after taking all environmentally sensitive areas into account.

SPOT Image background. Imagery dated 2009.



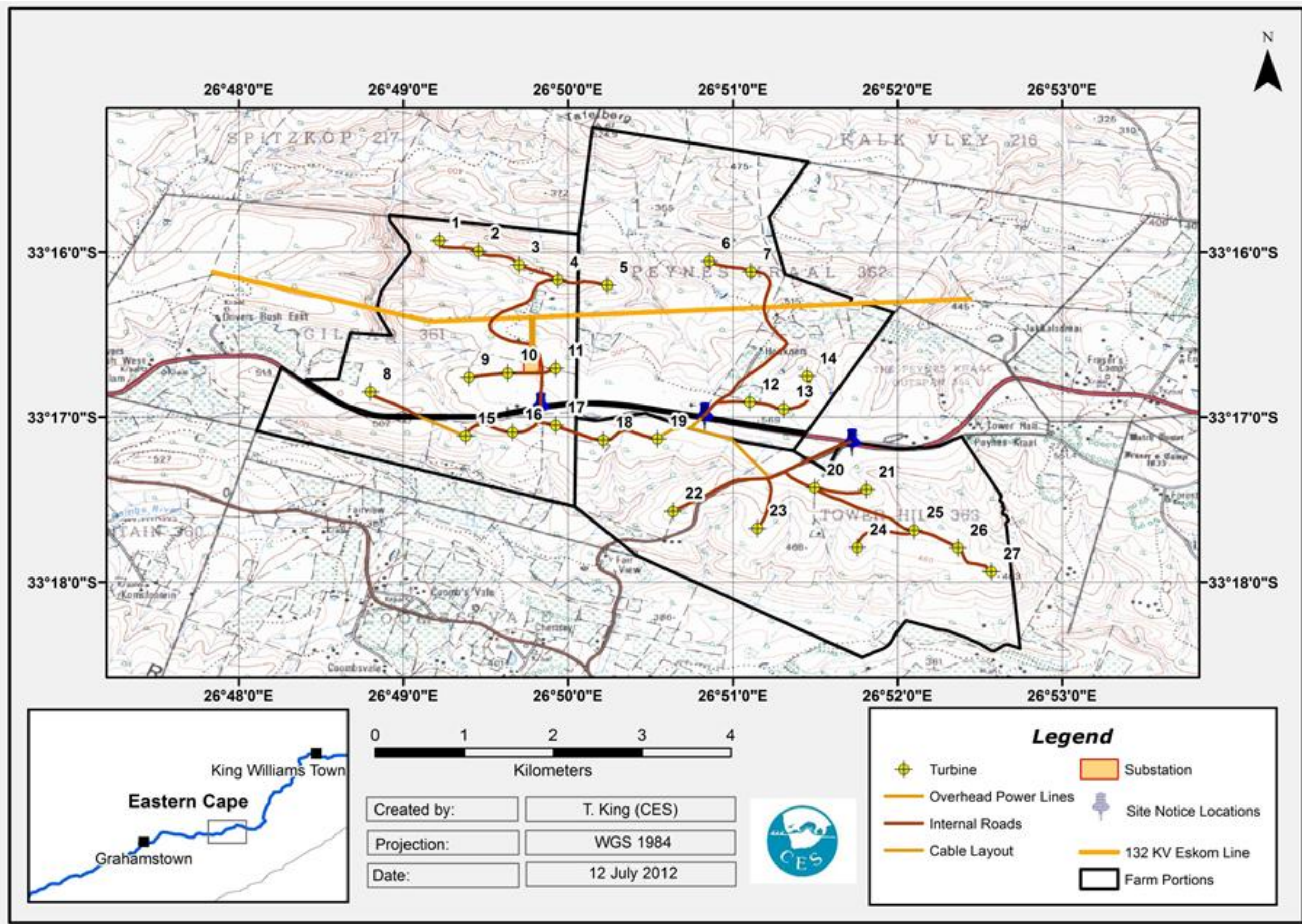


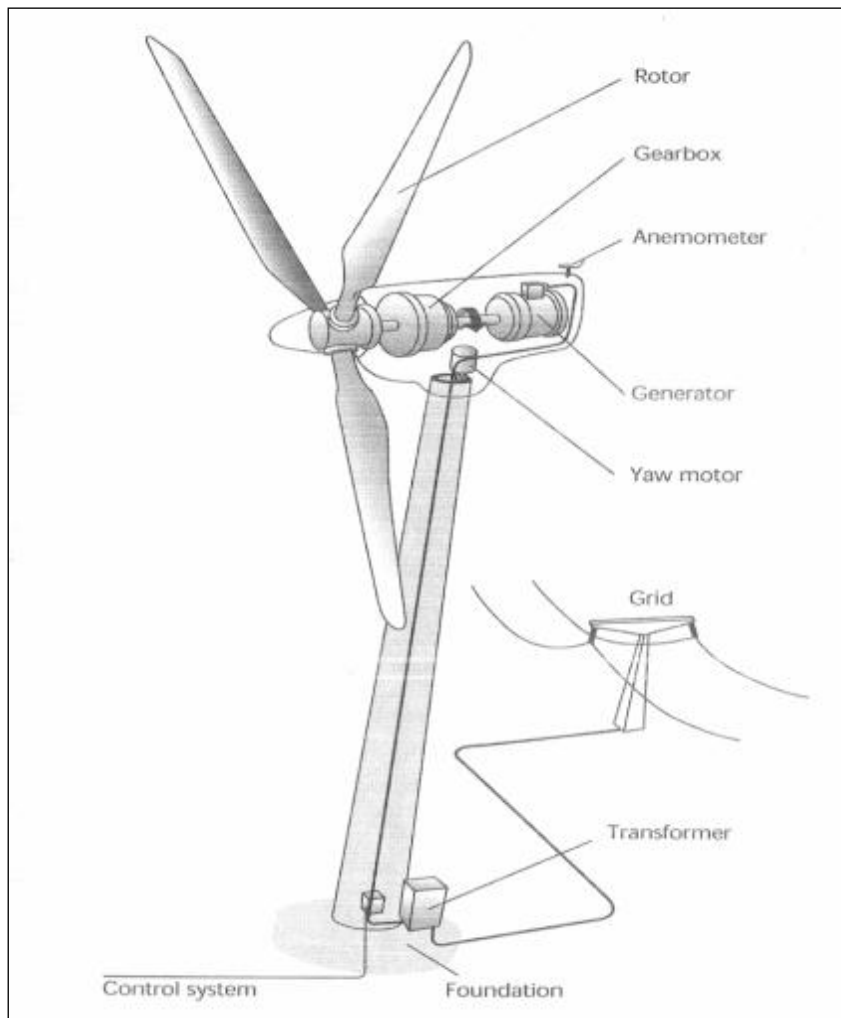
Figure 2-6: The final EIA and infrastructure wind farm layout, indicated on a 1:50000 topo-cadastral map.

**2.2.3 Construction Phase**

This phase comprises of the following sub phases:

**(a) Geotechnical studies and foundation works**

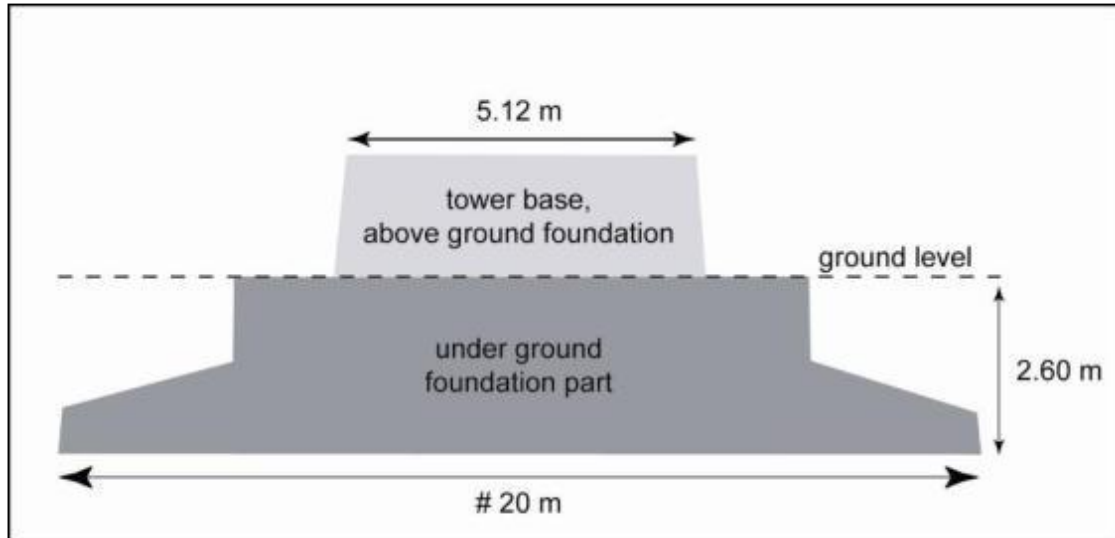
A geotechnical study of the area is always undertaken for safety purposes. This comprises disturbed and undisturbed sampling (e.g. trial pitting), core drilling, penetration and pressure assessments. Please note that a preliminary walk over investigation has been conducted and that a detailed geotechnical investigation will only be conducted once (and if) the project receives environmental authorisation. The preliminary investigation has found no fatal flaws from a geotechnical perspective. For the purpose of the foundations, approximately 500m<sup>3</sup> of substrate would need to be excavated for each turbine. These excavations will then be filled with steel-reinforced concrete. Approximately 221,000 m<sup>3</sup> of G5 fill material is required from commercial sources or a borrow pit on site. The geotechnical desktop assessment has indicated G5 material is available from borrow pits on site. The foundation design and concrete requirements can vary according to the quality and characteristics of the soil and underlying geology.



**Figure 2-7: Illustration of the main components of a typical wind turbine (note that the transformer can be located inside the tower section of each turbine)**

The main dimensions for the foundation of a 3MW/100m high wind turbine are shown in the Figure 2-8 with underground foundation, tower base, above ground foundation, and ground level.





**Figure 2-8: The main dimensions for the foundation of a 3MW/100m high wind turbine**

**(b) Turbine erection**

After excavation, foundations need to be laid and the concrete allowed to set to achieve its full design strength. This is the longest part of the process, and is typically 28 days from casting to erection. The process of erection is quick (around 3 days per turbine) if the weather conditions permit. This phase is also the most complex and costly and utilises heavy lift cranes in the assembly process (Figure 2-9).

**(c) Roads**

Internal roads, varying in width from 4.7 - 6 metres wide will connect each turbine, the substation and the N2 highway. These roads cannot be of a gradient of more than 6% otherwise trucks transporting the turbine components will not be able to reach their target sites. Steep roads may need to be concreted to prevent erosion. To a large extent existing farm roads will be utilised, although they will need to be upgraded. Some realignment will also be necessary to remove tight bends. Further conditions with which internal access roads must comply are the following:

- 40cm thick crusher run sub-base and wearing course on 30cm compacted sand
- Curve radius of at least 35m

**(d) Construction plant, cranes, lay down areas and construction platforms**

A temporary 'construction platform' is required at each turbine foundation site to ensure safe and stable access by heavy machinery and equipment (bulldozers, trucks, cranes etc.) during the construction phase.





**Figure 2-9: Assembly and erection of the tower sections**

Once the wind farm is operational, the construction platforms can be partially rehabilitated to reduce the final cumulative area of the total development footprint of the individual turbines.

**(e) Grid connection and substation**

Each turbine is fitted with its own transformer that steps up the voltage, usually to 22 or 33 kV. The substation to be constructed on site (refer to Figure 2.5 and 2.6) will allow the interconnection of the electricity generated on site into the ESKOM grid.

All electrical and communication cables are run approximately 0.5 - 1m deep below ground level, adjacent to the access roads. Additional cables will connect the substation to the ESKOM grid.

**(f) Water use requirements**

It is likely that batch mixing of concrete will be conducted on site. Plan 8 have received confirmation of a non-binding agreement of water availability from the Department of Water Affairs to utilise 20,379m<sup>3</sup> of water during the planned 18-month construction phase of the project.

**(g) Transport routes and volumes**

Turbine components will be transported from the Port of Ngqura at Coega via the N2 to the site. Transport of components will be arranged in conjunction with local traffic authorities to ensure safe transit and minimise disruption to normal traffic flow on this important highway. Turbine components may be transported at night when traffic volumes on the roads are less.

#### **2.2.4 Operational phase**

During the period when the turbines are up and running, on-site human activity drops to a minimum, and includes routine maintenance requiring only light vehicles to access the site. Only major breakdowns would necessitate the use of cranes and trucks.

#### **2.2.5 Refurbishment and rehabilitation of the site after operation**

Current wind turbines are designed to last for over 25 years (this figure can be extended by another 25 years if refurbishment takes place). Plan 8 (Pty) Ltd undertakes to dismantle all wind turbines and foundations to a depth of 1 metre underground at the end of the project's life. The excavation is backfilled with soil, and grass is replanted in order restore the site's appearance to its original state within a matter of weeks. The only residual material is the deeper concrete works below surface.

## DESCRIPTION OF THE AFFECTED ENVIRONMENT

In terms of section 31 (2) of the EIA regulations (2010), an *environmental impact assessment report must include:-*

*(d) A description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity*

In line with the above-mentioned regulatory requirement this chapter provides a description of the natural and socio-economic environments that could potentially be impacted by the proposed Plan 8 Grahamstown Wind Energy Project. Previous studies have included detailed descriptions of the general characteristics of the area in terms of climate, topography, hydrology, geology and hydro-geology, and a synthesis of this information is provided in this chapter. Descriptions of the flora and fauna are based on on-site investigations and a survey of the relevant literature to determine what could legitimately be expected to be found in the study area.

### 3.1 The Bio-physical Environment

#### 3.1.1 Climate

Due to the location of the study area at the confluence of several climatic regimes, namely temperate and subtropical, the Eastern Cape Province of South Africa has a complex climate. There are wide variations in temperature, rainfall and wind patterns, mainly as a result of movements of air masses, altitude, mountain orientation and the proximity of the Indian Ocean.

The region in which the project area is situated is at the heart of three major transitional climatic regions:

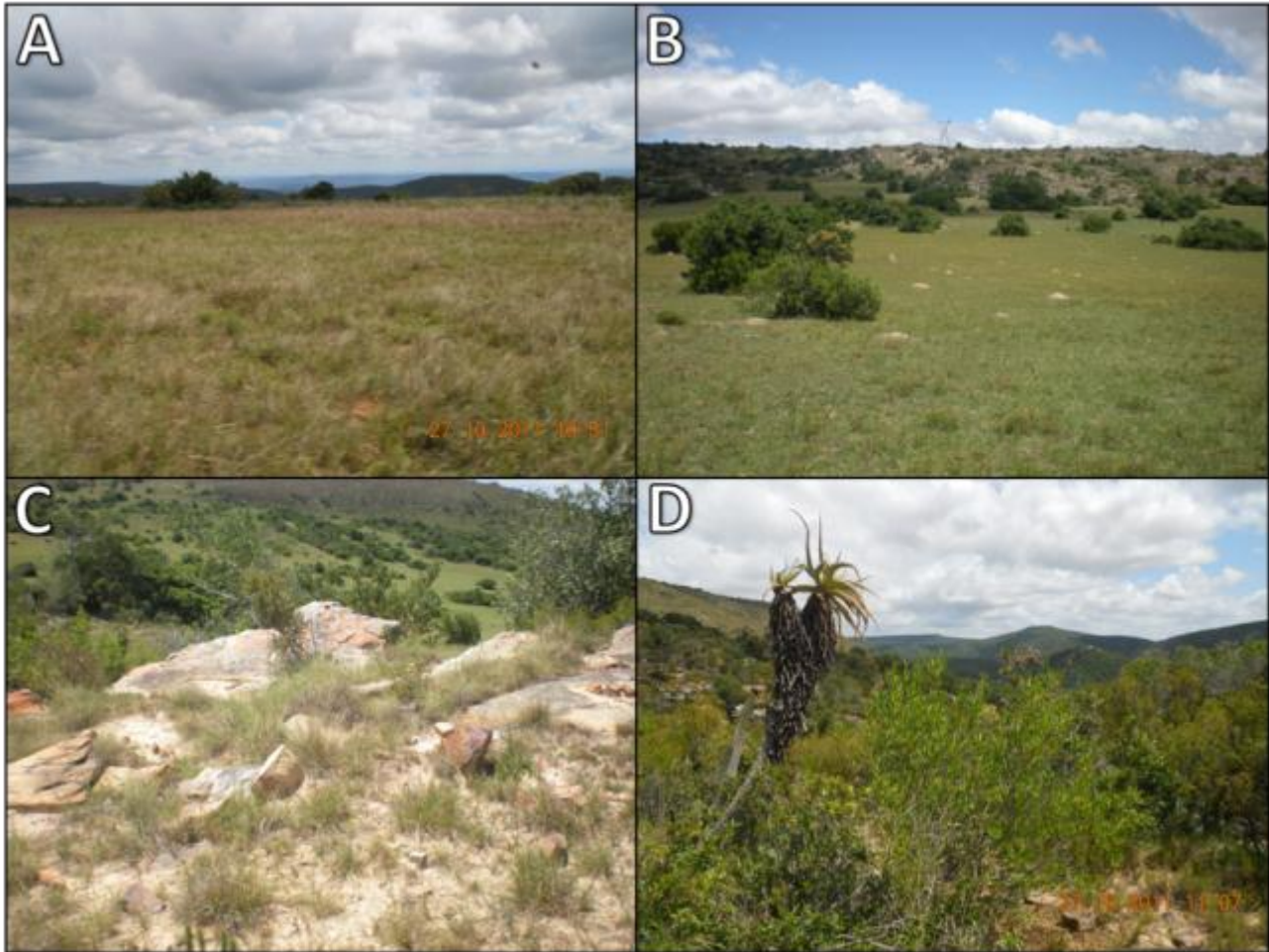
1. From the south-western region there is a maritime influence of winter rainfall. In this region it changes to spring and autumn rainfall with south easterly winds bringing torrential rains which are very variable and inconsistent.
2. From Grahamstown north–eastwards the rainfall changes to a general summer rainfall.
3. The interior south of the Winterberg is affected by both these climatic patterns, with cold fronts and little winter rain, but summer rain from sporadic thunder showers.

Winds and alternating cold and warm fronts thus make for a very variable climate throughout the region. Grahamstown normally receives about 470mm of rainfall per year and, because it receives most of its rainfall during winter, it has a Mediterranean climate. On average Grahamstown receives the lowest rainfall (16mm) in July and the highest (57mm) in March. The monthly distribution of average daily maximum temperatures indicates that the average midday temperatures for Grahamstown range from 18.9°C in July to 26.8°C in February. The region is the coldest during July when the mercury drops to 5.6°C on average during the night.

#### 3.1.2 Topography

The Eastern Cape Province contains a wide variety of landscapes, from the stark Karoo (the semi-desert region of the central interior of the country) to mountain ranges and gentle hills rolling down to the sea. The climate and topography give rise to the great diversity of vegetation types and habitats found in the region. The mountainous area on the northern boundary of the province forms part of the Great Escarpment. Another part of the escarpment lies just north of Bisho, Somerset East and Graaff-Reinet. In the south of the province the Cape Folded Mountains start between East London and Port Elizabeth and continue westward into the Western Cape. As is the situation in KwaZulu-Natal, the Eastern Cape is characterised by a large number of short, deeply incised rivers flowing parallel to each other. The area of the proposed wind energy facility comprises a

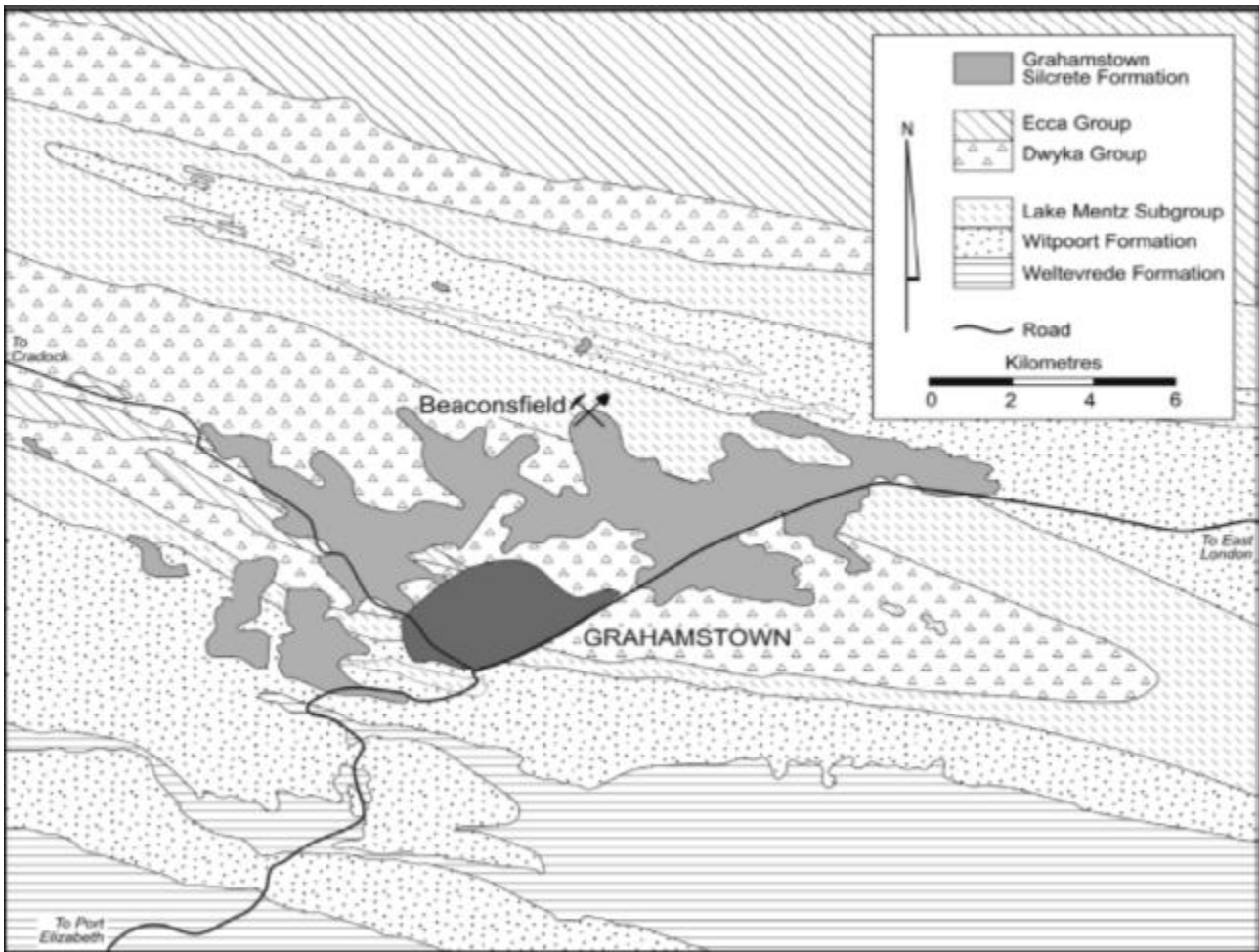
series of ridges which are flat to undulating, surrounding deeply incised valleys and undulating hills (Plate 3.1).



**Plate 3-1: Topography of the site**

### **3.1.3 Geology and Soils**

Grahamstown is situated in the eastern part of the Cape Fold Belt and is underlain mainly by rocks of the Witteberg Group of the Cape Supergroup, and the Dwyka and Ecca groups of the Karoo Supergroup. In the general area the oldest rocks of the Cape Supergroup are the shales and sandstones of the Weltevrede Formation, overlain by resistant quartz arenites of the Witpoort Formation. These quartzites are overlain by fine-grained shales and thin sandstones of the Lake Mentz and Kommadagga subgroups (Jacob *et al.*, 2004). The published geological map of the Grahamstown region (Council for Geoscience, 1995) does not indicate the presence of the Kommadagga Subgroup in the Grahamstown area (Figure 3-1). However, the Miller, Swartwaterspoort and Soutkloof formations of the Kommadagga Subgroup crop out west of Grahamstown, as well as the lowermost Dirkskraal Formation, immediately below the Dwyka Group. The rocks in the Kommadagga Subgroup are mainly shales, with minor greywacke and arenite sandstone units. Feldspar content increases upward in these rocks near the base of the Dwyka Group, reflecting cooler and drier conditions at the onset of glaciation. The Witteberg Group rocks are overlain by rocks of the Dwyka Group, the basal unit of the Karoo Supergroup. The contact generally is poorly exposed but probably is paraconformable (Jacob *et al.*, 2005).



**Figure 3-1: Simplified geological map of the area around Grahamstown**

Adapted from 1:250000 scale sheet 3326 Grahamstown. Source: Jacob *et al.* (2004)

The Dwyka consists mainly of glacial diamictite and is composed of a variety of angular to rounded clasts of various igneous and sedimentary rocks set in a fine-grained, dark, massive argillaceous matrix. The overlying argillaceous and arenaceous rocks of the Ecca Group occur mainly to the north of the area. In the area around Grahamstown, the Dwyka Group forms a syncline whose fold axial trace trends East South East (ESE) (see Figure 3-1). This syncline plunges at a low angle to the West North West (WNW). To the north and south of the syncline, quartzite ridges of the Witpoort Formation form the higher-lying hills that enclose the area where the Grahamstown peneplain was developed. The peneplain varies in altitude from 620 to 660m above sea level. The original peneplain extended more than 300 km<sup>2</sup>. However, only a remnant, about 34 km<sup>2</sup>, remains. Remnants of this peneplain owe their preservation to the resistant layer of silcrete, which hinders erosional destruction. Clay deposits underlie the peneplain and represent mainly the deeply weathered profile that developed during Cretaceous to Tertiary times.

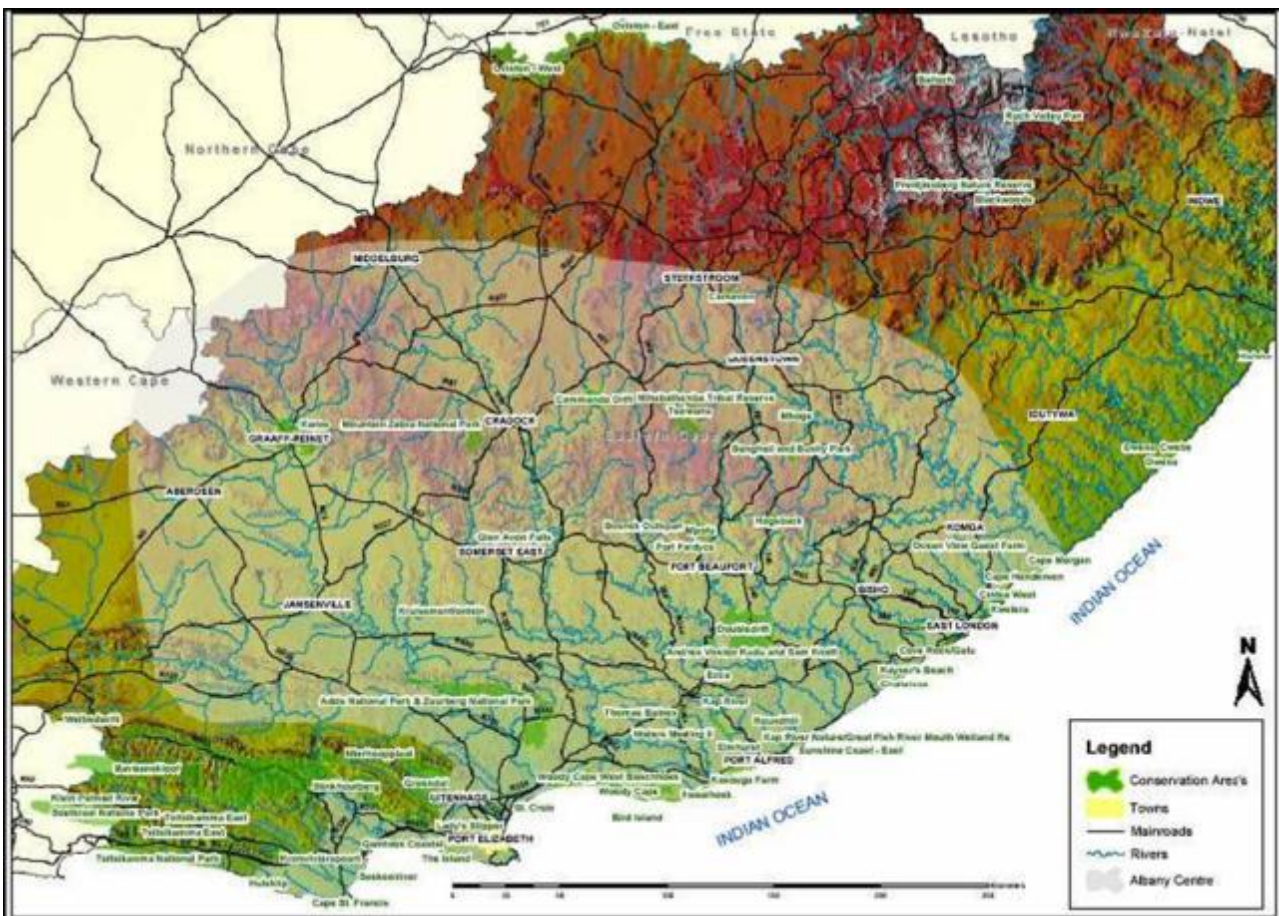
### 3.2 Vegetation and Floristics

The vegetation of the Eastern Cape is complex and is transitional between the Cape and subtropical floras, and many taxa of diverse phytogeographical affinities reach the limits of their distribution in this region. The region is best described as a tension zone where four major biomes converge and overlap (Lubke *et al.*, 1988). The dominant vegetation is Succulent Thicket (Spekboomveld or Valley Bushveld), a dense spiny vegetation type unique to this region. While species in the canopy are of subtropical affinities, and generally widespread species, the succulents and geophytes that comprise the understorey are of karroid affinities and are often localised endemics.



The Makana area is a region of floral transition and complexity, as it forms a major climatic, topographical, geological and pedological (soil) transition zone where four phytogeographical regions (plant regions) converge. The Cape floral elements extend eastwards along the Cape Mountains and diminish in abundance from Grahamstown to the east. The Tongoland-Pondoland flora enters the region along the east coast, and thicket vegetation penetrates up the river valleys. The succulent and sub-desert shrublands of the Karoo-Namib region extend down the dry river valleys from the arid interior. Afromontane elements of grassland and forest vegetation types extend down the mountains of Africa. In many of the plant communities of the area, a great complexity of floral elements is evident, and the area is described as a phytochorologically mixed flora. This means that the area is rich in plant diversity, with numerous interesting plants from a range of plant regions.

Albany, honouring the Duke of York, was the name given to the region (formerly called Zuurveld) around Grahamstown in 1814. This name has been used by botanists and phytogeographers to recognise a centre of endemism, an area with unusually high concentrations of plant species with restricted distributions (van Wyk and Smith, 2001). The Albany Centre is an important area of succulent endemism, many of which are associated with the xeric thicket vegetation in the region. As described above, Grahamstown falls within the Albany Centre of Floristic Endemism; also known as the Albany Hotspot (Figure 3-2). This is an important centre for plant taxa, and, according to van Wyk and Smith (2001), contains approximately 4000 vascular plant species with approximately 15% either endemic or near-endemic (Victor and Dold, 2003). This area was delimited as the 'region bounded in the west by the upper reaches of the Sundays and Great Fish River basins, in the east by the Indian Ocean, in the south by the Gamtoos–GrootRiver basin and in the north by the Kei River basin' (Victor and Dold, 2003)



**Figure 3-2: The Albany Centre of Endemism, also known as the ‘Albany Hotspot’, has long been recognised as an important centre of plant species diversity and endemism (From van Wyk and Smith 2001).**

### 3.2.1 Species of Special Concern (SSC)

Species endemic to the area are described by Mucina and Rutherford (2006). In addition to the endemic taxa there are also a number of species expected to be found in the study area, some of which are listed as protected by various conservation bodies. The list is not complete, as many species and taxa require additional study. The taxa with many data deficient species include specifically the Mesembranthemaceae family, which Victor and Dold (2003) estimate would have 72 species that should, but do not, occur on the list.

Thus all species of the family are included as Species of Special Concern (SSC). Victor and Dold (2003) also include a number of other taxa as important; including members of the Amaryllidaceae (Amaryllids), Iridaceae (Irises), Orchidaceae (Orchids) and Apocynaceae (Lianas), as well as members of the genus *Aloe*.

Potential Species of Special Concern (PSSC) include all those plants listed in terms of the IUCN, CITES and both national and provincial legislation that may occur in the area of study. If any of these species are found to occur on site, they are given the status of Confirmed Species of Special Concern (CSSC).

The list of PSSC includes over 130 species which are listed individually by Victor and Dold (2003), the IUCN red data list, the South African National Biodiversity Institute (SANBI), the Forests Act and the Provincial Conservation Ordinance (PNCO) 16 of 1974 for the Eastern Cape. In addition, the PNCO lists eight plant families and six plant genera that are afforded blanket protection throughout the province. Confirmed Species of Special Concern (CSSC) were identified from the ecological assessment.

### 3.2.2 Alien invasive species

It is likely that a number of alien invasive species already occur on site, some of these are shown in Plate 3.3 below. It is important that these are properly controlled. Additional information is available in the Ecological Impact Assessment.

### 3.2.3 Regional Vegetation

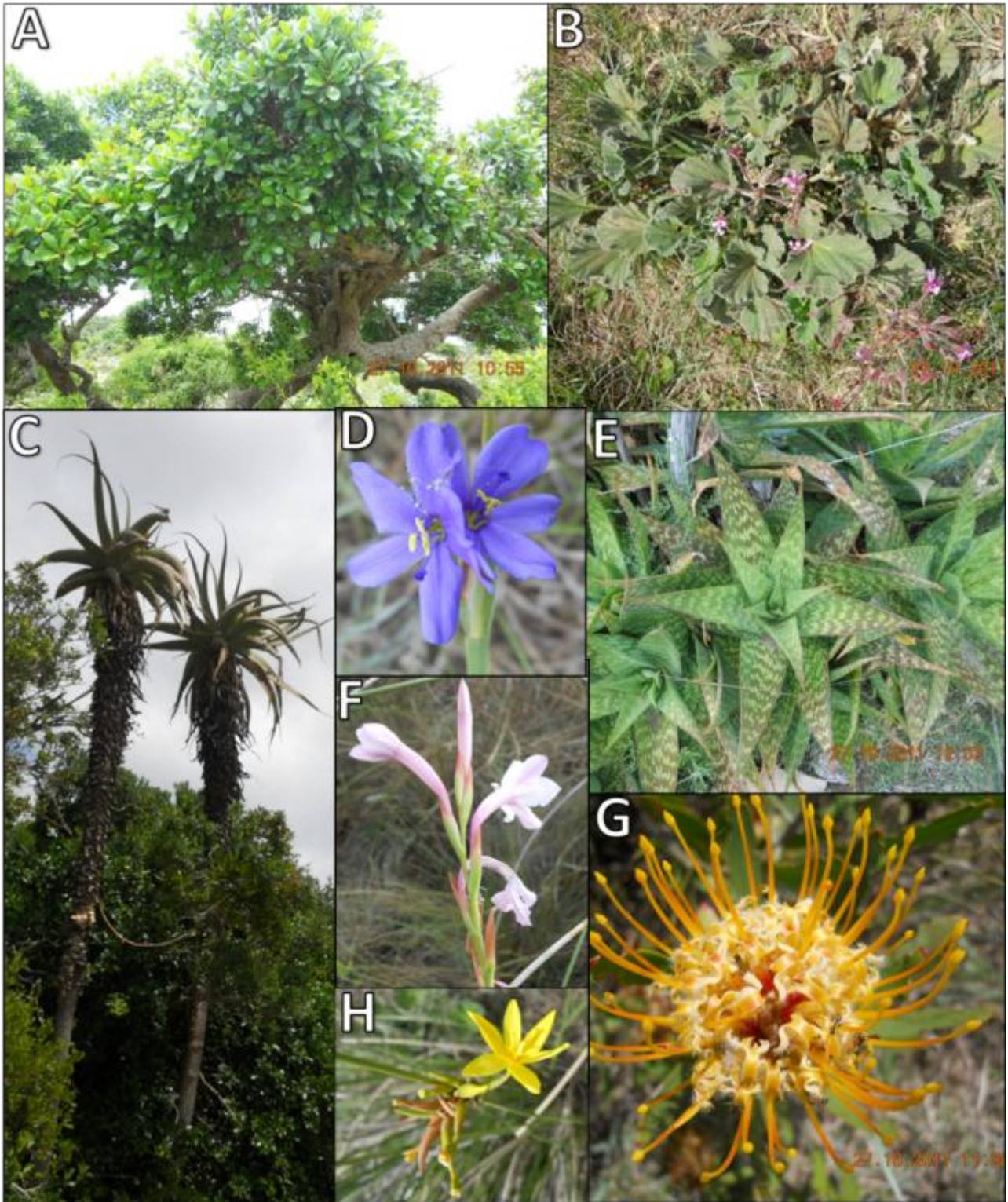
The vegetation types described by Mucina and Rutherford (2006) for the area are Kowie Thicket and Bisho Thornveld (Figure 3-3):

#### **Kowie Thicket**

This vegetation type is restricted to the Eastern Cape Province, in river valleys (Mucina & Rutherford 2006). It occurs on mainly steep and north-facing (dry) slopes. Tall thickets dominated by succulent euphorbias and aloes with a thick understory composed of thorny shrubs, woody lianas (*Capparis*, *Secamone*, *Rhoicissus*, *Aloe*), and shrubby succulents (Crassulaceae, Asphodelaceae). Moister south-facing slopes support thorny thickets dominated by low evergreen trees (*Azima*, *Carissa*, *Gymnosporia*, *Putterlickia*) with fewer succulent shrubs and trees. The herbaceous layer is poorly developed (Mucina & Rutherford 2006).

This vegetation type is listed as Least Threatened, with a conservation target of 19% (Mucina & Rutherford 2006). 5% is statutorily conserved and 14% in private conservation areas. 7% is transformed, primarily by cultivation. This vegetation type is the core of the Albany Thicket Biome and the major floristic node of the Albany Centre of endemism (Mucina & Rutherford 2006).





**Plate 3-2: Confirmed Species of Special Concern (CSSC).**

A: *Sideroxylon inerme* (Forest Act), B: *Pelargonium reniforme* (IUCN), C: *Aloe africana* (PNCO, CITES), D: *Aristea abyssinica* (PNCO), E: *Aloe maculata* (PNCO, CITES), F: *Watsonia sp* (PNCO), G: *Leucospermum sp* (PNCO) and H: *Bobaria orientalis* (PNCO).





## **Bisho Thornveld**

This vegetation type occurs in the Eastern Cape Province inland from the coast from Mthatha to North of East London as far as Fort Beaufort and occurring near Grahamstown (Mucina & Rutherford 2006). Bisho Thornveld occurs on undulating planes and shallow drainage valleys. It comprises open savannah characterised by small trees of *Acacia natalitia* with a short to medium, dense, sour grassy understory, usually dominated by *Themeda triandra*. A diversity of other woody species may occur, increasing under conditions of overgrazing. The vegetation type is wide-ranging, and fire and grazing are important determinants (Mucina & Rutherford 2006).

This vegetation type is listed at Least Threatened by Mucina and Rutherford (2006). The conservation target is 25%, with only 0.2% statutorily conserved and 2% privately conserved. 20% has been transformed, mainly for cultivation, urban development or plantations (Mucina & Rutherford 2006).

STEP describes the vegetation types of the area as Grahamstown grassland thicket, Albany Coastal Thornveld and Albany Valley Thicket (Figure 3-4).

## **Grahamstown Grassland Thicket**

Thicket clumps are typical of Albany Thicket, and contain taaibos (*Rhus pallens*), katdoring (*Scutia myrtina*), kiepersol (*Cussonia spicata*) and poison peach (*Diospyros dicrophylla*) (Pierce & Mader 2006). The grassland matrix has many fynbos elements (*Erica* sp and *Restio triticeus*) as well as numerous species of rare localised endemic species, such as the genus *Brachystelma*.

Grahamstown Grassland Thicket is listed as Least Threatened by STEP (Pierce & Mader 2006).

## **Albany Coastal Thornveld**

Albany Coastal Thornveld is dominated by sweet thorn trees (*Acacia karroo*) and dense grassland dominated by *Themeda triandra*, *Heteropogon contortus* and *Tristachya leucothrix* with an admixture of fynbos elements (Pierce & Mader 2006).

This vegetation type is listed at Least Threatened by STEP (Pierce & Mader 2006).

## **Albany Valley Thicket**

The dominant tree species of Albany Thicket include doppruim (*Pappea capensis*) and qwarrie (*Euclea undulata*) (Pierce & Mader 2006). Characteristic species include the succulents *Aloe Africana* and *Kalanchoe rotundifolia*. The most distinguishing feature is the tall *Euphorbia tetragona* plants emerging above the canopy.

Albany Valley Thicket is listed as Vulnerable by STEP (Pierce & Mader 2006). Refer to figure 3.4 to view the extent of this vegetation type over the project area.

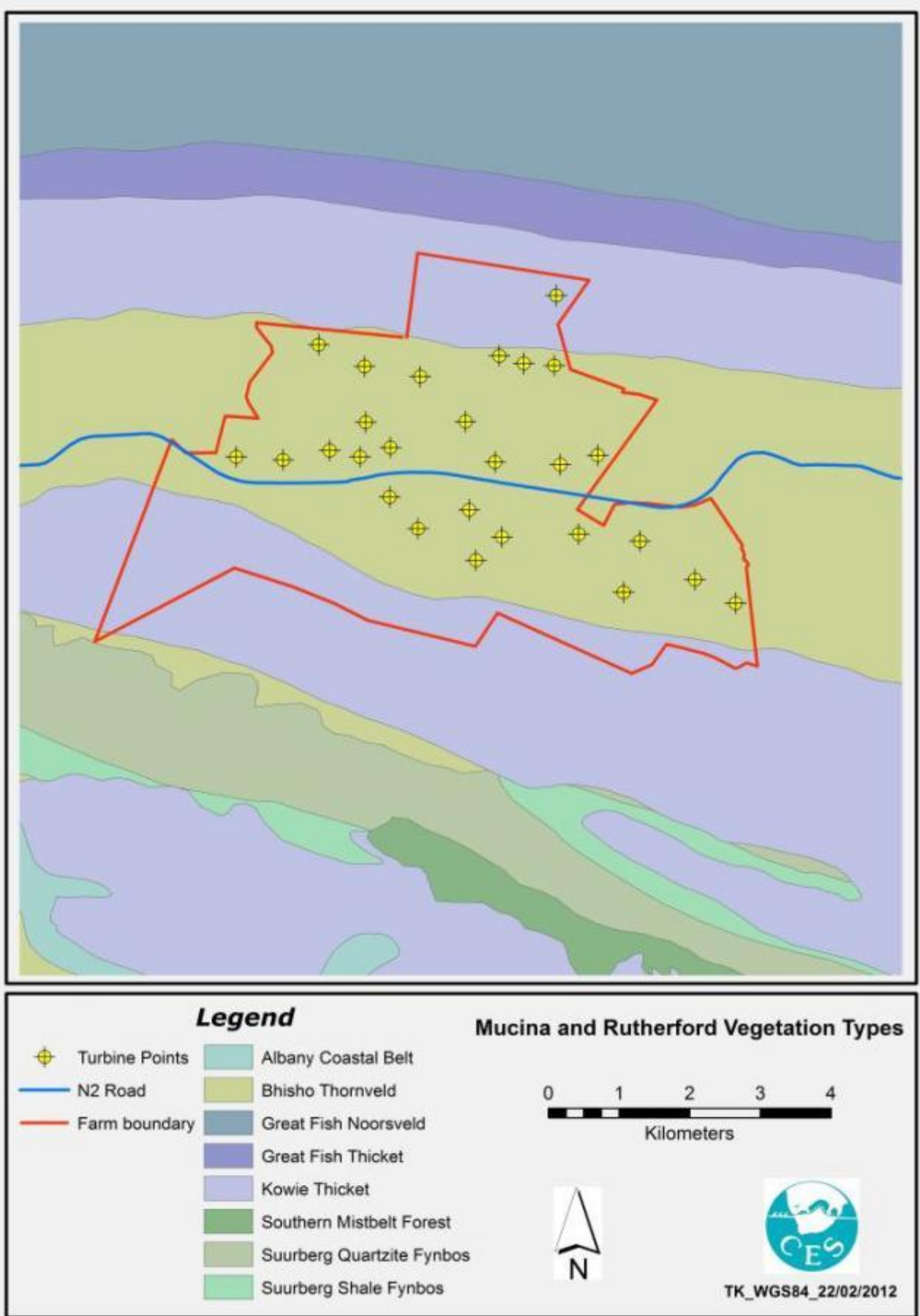


Figure 3.3: Mucina and Rutherford vegetation map of the study area.



### 3.2.4 Subtropical Thicket Ecosystem Planning (STEP) Project

The STEP Project covers the south-eastern Cape region, which extends from the Kei River to Riversdale. The project area covers the unique, indigenous vegetation type known as thicket, with the aim being to assess the region's biodiversity. The assessment measured how much of the thicket vegetation had been damaged or destroyed through anthropogenic impacts and determined the degree to which biodiversity is endangered in different areas. The project aims to guide the necessary but destructive development away from areas of endangered biodiversity and promote sustainable land use.

In terms of STEP (2004) a feature that has much more extant habitat than is needed to meet its target is considered Currently Not Vulnerable OR Least Threatened (Table 3.1).

For Currently Not Vulnerable vegetation, STEP recommends three Land use management procedures, these include:

- a) Proposed disturbance or developments should preferably take place on portions which have already undergone disturbance or impacts rather than on portions that are undisturbed or unspoilt by impacts.
- b) In response to an application for a non-listed activity which will have severe or large-scale disturbance on a relatively undisturbed site (unspoilt by impacts), the Municipality should first seek the opinion of the local conservation authority.
- c) For a proposed "listed activity", EIA authorisation is required by law.

From a Spatial planning (forward planning – Spatial Development Framework (SDF's)) point of view, for Currently Not Vulnerable vegetation, STEP presents two restrictions and gives examples of opportunities. The two spatial planning restrictions are as follows:

- Proposed disturbance or developments should preferably take place on portions which have already undergone disturbance or impacts rather than on portions that are undisturbed.
- In general, Class IV land can withstand loss of disturbance to natural areas through human activities and developments.

Opportunities depend on constraints (such as avoidance of spoiling scenery or wilderness, or infrastructure limitations) Class IV land can withstand loss of, or disturbance to, natural areas. Within the constraints, this class may be suitable for a wide range of activities (e.g. extensive urban development, cultivation, tourist accommodation, ecotourism and game farming).

**Table 3-1: Summary of the STEP Project conservation priorities, classifications and general rules**

Source: Pierce, 2003

Conservation priority	Classification	Brief Description	General Rule
IV	Currently not vulnerable area	Ecosystems which cover most of their original extent and which are mostly intact, healthy and functioning	Depending on other factors, this land can withstand loss of natural area through disturbance or development
III	Vulnerable area	Ecosystems which cover much of their original extent but where further disturbance or destruction could harm their health and functioning	This land can withstand limited loss of area through disturbance or development

Conservation priority	Classification	Brief Description	General Rule
II	Endangered area	Ecosystems whose original extent has been severely reduced, and whose health, functioning and existence is endangered	This land can withstand minimal loss of natural area through disturbance or development
I (Highest Priority)	Critically endangered area	Ecosystems whose original extent has been so reduced that they are under threat of collapse or disappearance. Included here are special ecosystems such as wetlands and natural forests	This Class I land can NOT withstand loss of natural area through disturbance or development. Any further impacts on these areas must be avoided. Only biodiversity-friendly activities must be permitted.
High Priority	Network Area	A system of natural pathways e.g. for plants and animals, which if safeguarded, will ensure not only their existence, but also their future survival.	Land in Network can only withstand minimal loss of natural area through disturbance and developments
Highest Priority	Process Area	Area where selected natural processes function e.g. river courses, including their streams and riverbanks, interfaces between solid thicket and other vegetation types and sand corridors	Process area can NOT withstand loss of natural area through disturbance and developments
	Municipal reserve, nature reserve, national parks	Protected areas managed for nature conservation by local authorities, province or SA National Parks	No loss of natural areas and no further impacts allowed
Dependant on degree on existing impacts	Impacted Area	Areas severely disturbed or destroyed by human activities, including cultivation, urban development and rural settlements, mines and quarries, forestry plantations and severe overgrazing in solid thicket.	Ability for this land to endure further disturbance or loss of natural area will depend on the land's classification before impacts, and the position, type and severity of the impacts

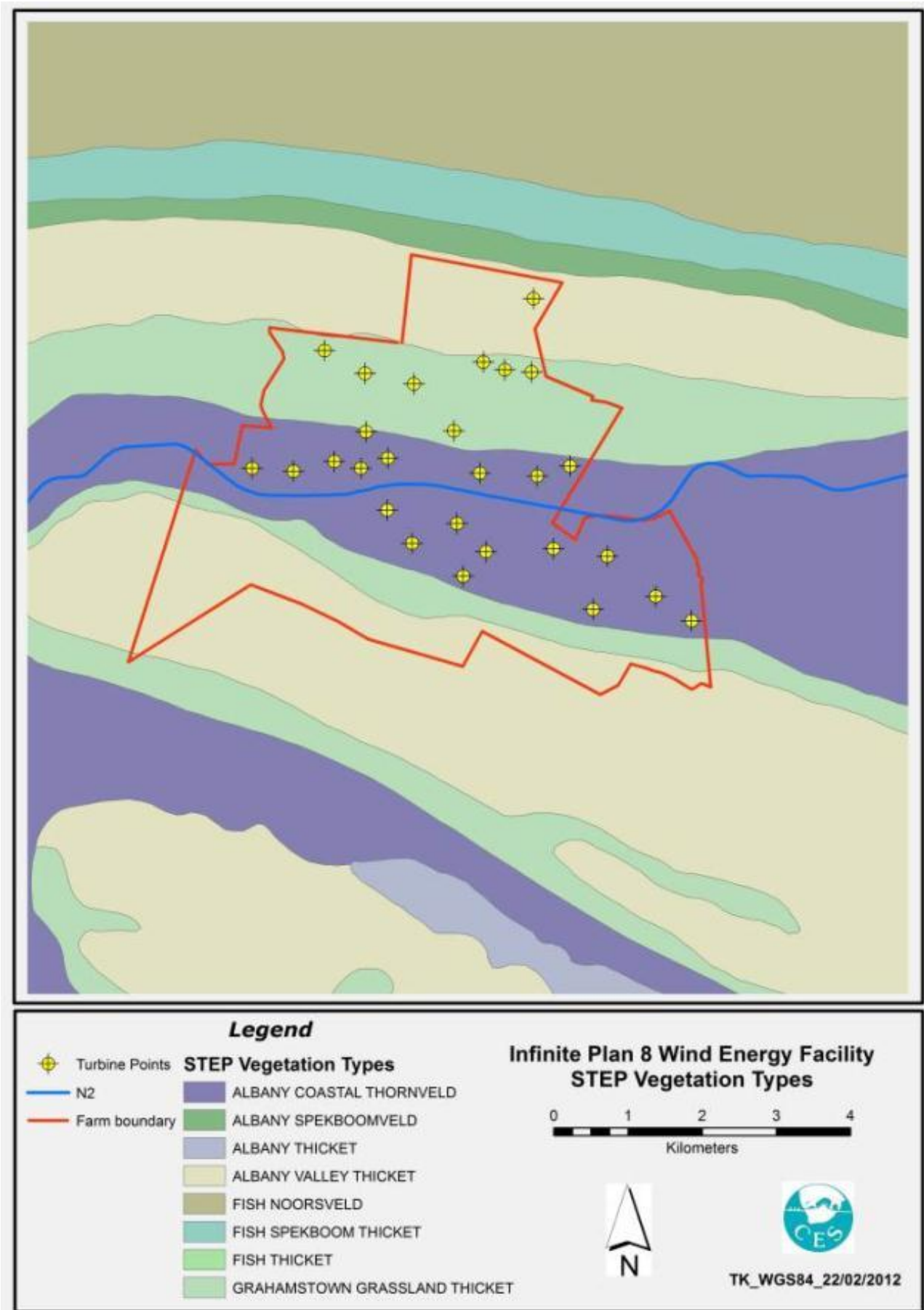
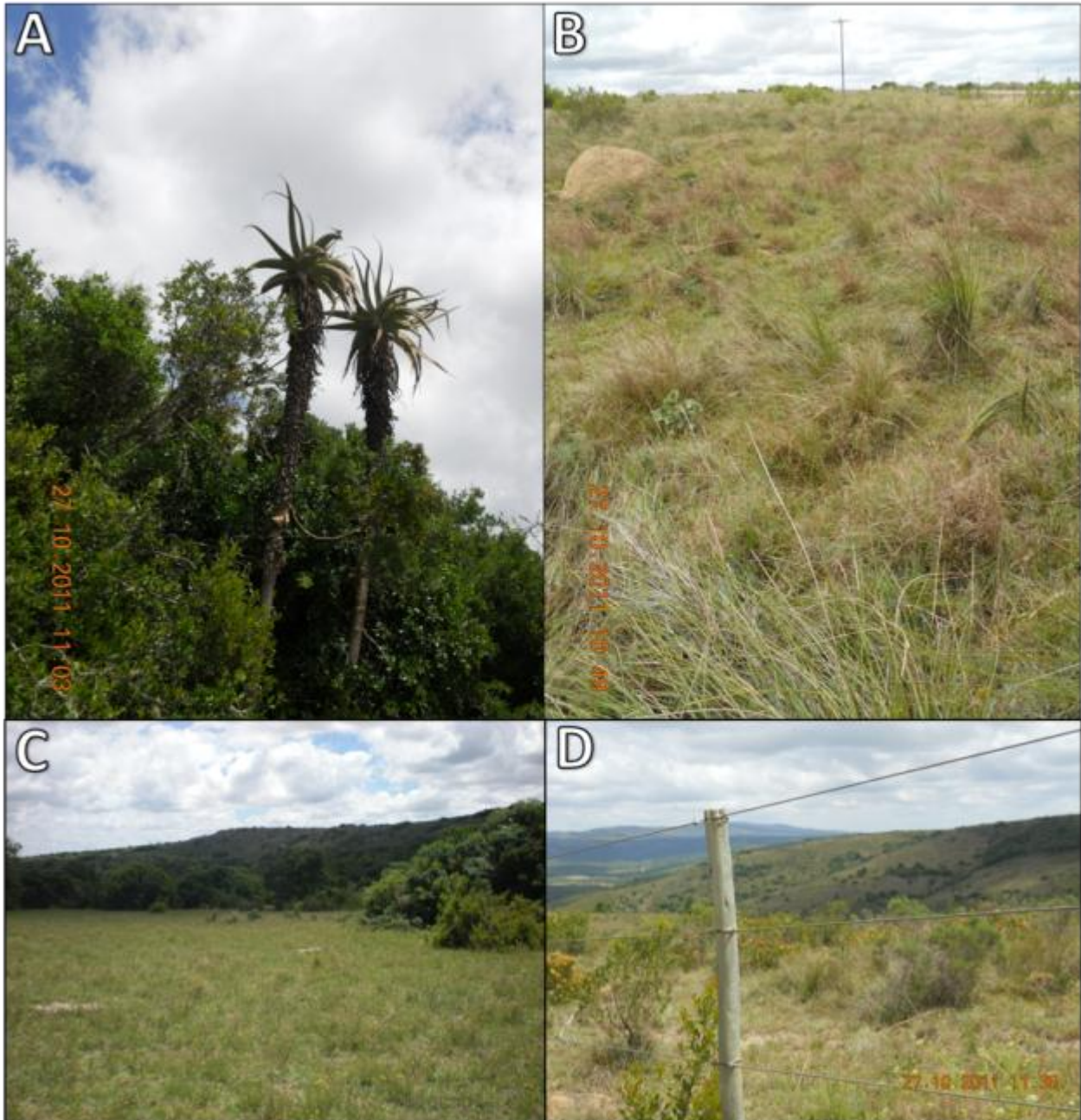


Figure 3-4: STEP vegetation map of the study area.

**3.2.5 Vegetation of the study area**

Several different vegetation types occur on site. These are shown in Plate 3.4. Thicket occurs on steep slopes and down to valley bottoms, Grassland occurs on top of ridges where overgrazing is apparent by the overpopulation of *Bobartia orientalis* and *Pteroni incana*.

In much degraded thicket, grassland occurs between overgrazed thicket clumps. In some areas on slopes tending to the tops of ridges, fynbos occurs. This fynbos supports a wide variety of species of special concern and it is expected that several species of the Protea and Iris families will be recorded from this area.



**Plate 3-4: Vegetation types from the study area**

A: thicket, B: grassland with evidence of overgrazing, C: degraded thicket and D: grassy fynbos.

### 3.3 Fauna

#### 3.3.1 Habitats

Lack of pristine terrestrial habitat in the Grahamstown area, particularly due to loss of natural vegetation caused by infestation by alien invasive species, urban development and farming, has impacted on terrestrial fauna. Despite this, a few large mammals occur in the region, along with small and medium sized animals. Reptile and amphibians occurring in the area include many species of frogs, tortoises and terrapins, lizards and snakes. Important mammals occurring in the study area include five IUCN Red Data listed species.

#### 3.3.2 Vertebrates

##### Amphibians and Reptiles

Over one hundred species of reptiles and amphibians occur on the Eastern and Southern Cape Coastal Belt (Branch, 1998). Most are generalists, and represent the transition from temperate to tropical fauna, some montane forms occur in the Cape Fold Mountains (Branch 1998). Amphibians are an important and often neglected component of terrestrial vertebrate faunas. They are well represented in sub-Saharan Africa, from which approximately 600 species have been recorded (Frost, 1985). Currently amphibians are of increasing scientific concern as global reports of declining amphibian populations continue to appear. Although there is no consensus on a single cause for this phenomenon, there is general agreement that the declines in many areas, even in pristine protected parks, are significant and do not represent simple cyclic events.

Frogs have been aptly called bio-indicator species, whose abundance and diversity is a reflection of the general health and well-being of aquatic ecosystems. They are important components of wetland systems, particularly ephemeral systems from which fish are either excluded or of minor importance. In these habitats, they are dominant predators of invertebrates, many of which may impact significantly on humans as, for instance, vectors of disease. A relatively rich amphibian fauna occurs in the Eastern and Southern Cape coastal region, where 27 species are found, only three of which are endemic (Branch 1998).

The Eastern Cape is home to 133 reptile species including 21 snakes, 27 lizards and eight chelonians (tortoises and turtles) (Branch, 1998). Five species of land tortoises occur in the Eastern Cape, three of which occur within the coastal belt. The Eastern Cape has the richest diversity of land tortoises in the world. These three coastal belt species include the leopard tortoise (*Geochelone pardalis*), the angulate tortoise (*Chersina angulata*) and the parrot-beaked tortoise (*Homopus areolatus*). All three of these tortoise species are listed on the CITES Appendix II list. The cape terrapin (*Pelomedus asubrufa*) is also found in the region (Branch 1998). Over 30 species of snakes occur in the coastal region, of these, only six species are dangerous (Branch, 1998).

##### Birds

Several birds of conservation importance occur in the study area which includes: 11 Vulnerable, and 9 Near Threatened species (IUCN, 2008), 15 CITES Appendix II, and one CITES Appendix I bird species (CES, 2009). Four Species of Special Concern (SSC), all of which are rated as "Vulnerable" may occur in the study area, these include: Denham's Bustard, Martial Eagle, Black Harrier, and Blue Crane (CES, 2009).

##### Mammals

Large game makes up less than 15% of the mammal species in South Africa and a much smaller percentage in numbers and biomass. In developed and farming areas this percentage is greatly



reduced, with the vast majority of mammals present being small or medium-sized. Of the 62 mammal species known or expected to occur in the region, none are now considered endemic to the coastal region. Although historical records show that many large animals such as various antelope, elephants, hippopotamuses and lions did occur in the region, they no longer do (Perrin 1998). The conservation status of South African mammals has recently been re-assessed. The conservation status of some has been downgraded, with the African wild cat, Aardvark, Blue duiker, and Honey badger are no longer considered threatened.

### 3.3.3 Animal species of special concern

The following reptile species which are relevant to the proposed project site are of conservation concern:

- Endemic and Endangered
  - Albany dwarf adder (*Bitisal banica*)
- IUCN Red Data Species
  - Southern dwarf chameleon (*Bradypodion ventrale*)
  - Cape girdled lizard (*Cordylus cordylus*)
  - Leopard or Mountain Tortoise (*Geochelone pardalis*),
  - Angulate Tortoise (*Chersina angulata*), and
  - Parrot-beaked tortoise (*Homopus areolatus*)
  - Yellow-bellied house snake (*Lamprophis fuscus*)

The following mammals which may occur in the proposed project area are of conservation concern (IUCN):

- Black-footed Cat (*Felis nigripes*)
- Duthie's golden mole (*Chlorotal paduthieae*)
- Straw-coloured fruit bat (*Eidolon helvum*)
- Schreiber's long-fingered bat (*Miniopterus schreibersi*)
- Mountain zebra (*Equus zebra*)

### 3.4 Terrestrial Invertebrates

Of nearly 650 butterfly species recorded within the borders of South Africa 102 are considered of conservation concern and are listed in the South African Red Data Book (RDB) for Butterflies. According to the most recent IUCN red data list there are no members of the Athropoda (insects, arachnids and crustaceans) Phylum in the area that can be defined as SSC.

### 3.5 Land Use and the Eastern Cape Biodiversity Conservation Plan (ECBCP)

The Eastern Cape Biodiversity Conservation Plan (ECBCP) is responsible for mapping areas that are priorities for conservation in the province, as well as assigning land use categories to the existing land depending on the state that it is in (Berliner *et al*, 2007).

Critical Biodiversity Areas (CBA) are defined by Berliner *et al.* (2007) as: "CBAs are terrestrial and aquatic features in the landscape that are critical for conserving biodiversity and maintaining ecosystem functioning". Biodiversity Land Management Classes (BLMCs) are also used in the plan: "Each BLMC sets out the desired ecological state that an area should be kept in to ensure biodiversity persistence. For example, BLMC 1 refers to areas which are critical for biodiversity persistence and ecosystem functioning, and which should be kept in as natural a condition as possible". Table 3.2 shows how the BLMCs relate to the CBAs. Figure 3-5 indicates the CBAs occurring in and around the proposed project boundary.

**Table 3-2: Terrestrial Critical biodiversity Areas and Biodiversity Land Management Classes as described by the Eastern Cape Biodiversity Conservation Plan.**

<b>CBA map category</b>	<b>Code</b>	<b>BLMC</b>	
Terrestrial CBAs and BLMCs:			
Protected areas	PA1	BLMC 1	Natural landscapes
	PA2		
Terrestrial CBA 1 (not degraded)	T1		
Terrestrial CBA 1 (degraded)	T1	BLMC 2	Near-natural landscapes
Terrestrial CBA 2	T2		
	C1		
	C2		
Other natural areas	ONA T3	BLMC 3	Functional landscapes
	ONA		
Transformed areas	TF	BLMC 4	Transformed landscapes

**Table 3-3: Terrestrial BLMCs and Land Use Objectives**

<b>BLMC</b>	<b>Recommended land use objective</b>
BLMC 1: Natural landscapes	Maintain biodiversity in as natural state as possible. Manage for no biodiversity loss.
BLMC 2: Near natural landscapes	Maintain biodiversity in near natural state with minimal loss of ecosystem integrity. No transformation of natural habitat should be permitted.
BLMC 3: Functional landscapes	Manage for sustainable development, keeping natural habitat intact in wetlands (including wetland buffers) and riparian zones. Environmental authorisations should support ecosystem integrity.
BLMC 4: Transformed landscapes	Manage for sustainable development.

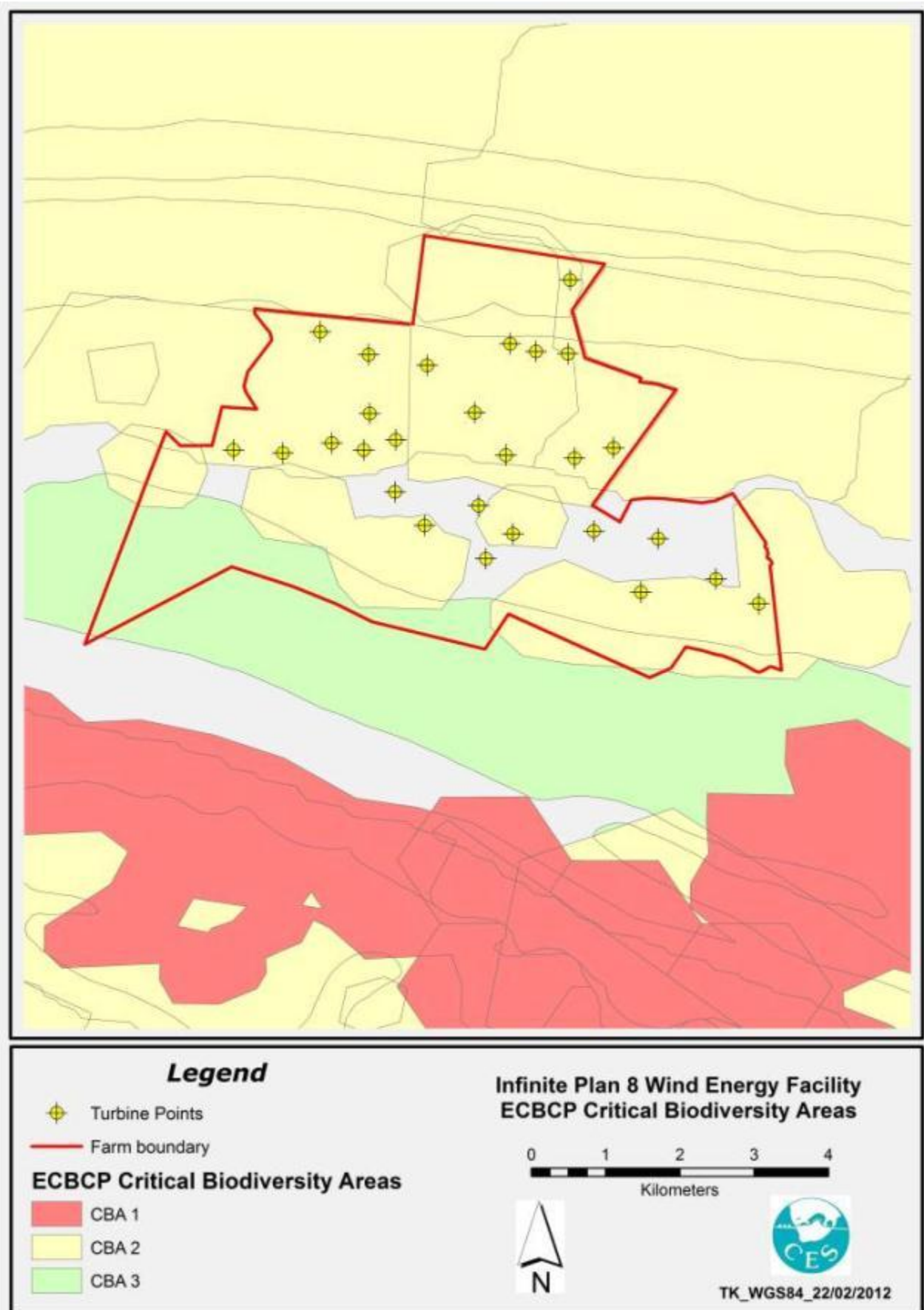


Figure 3-5: CBAs occurring in and around the proposed project area.

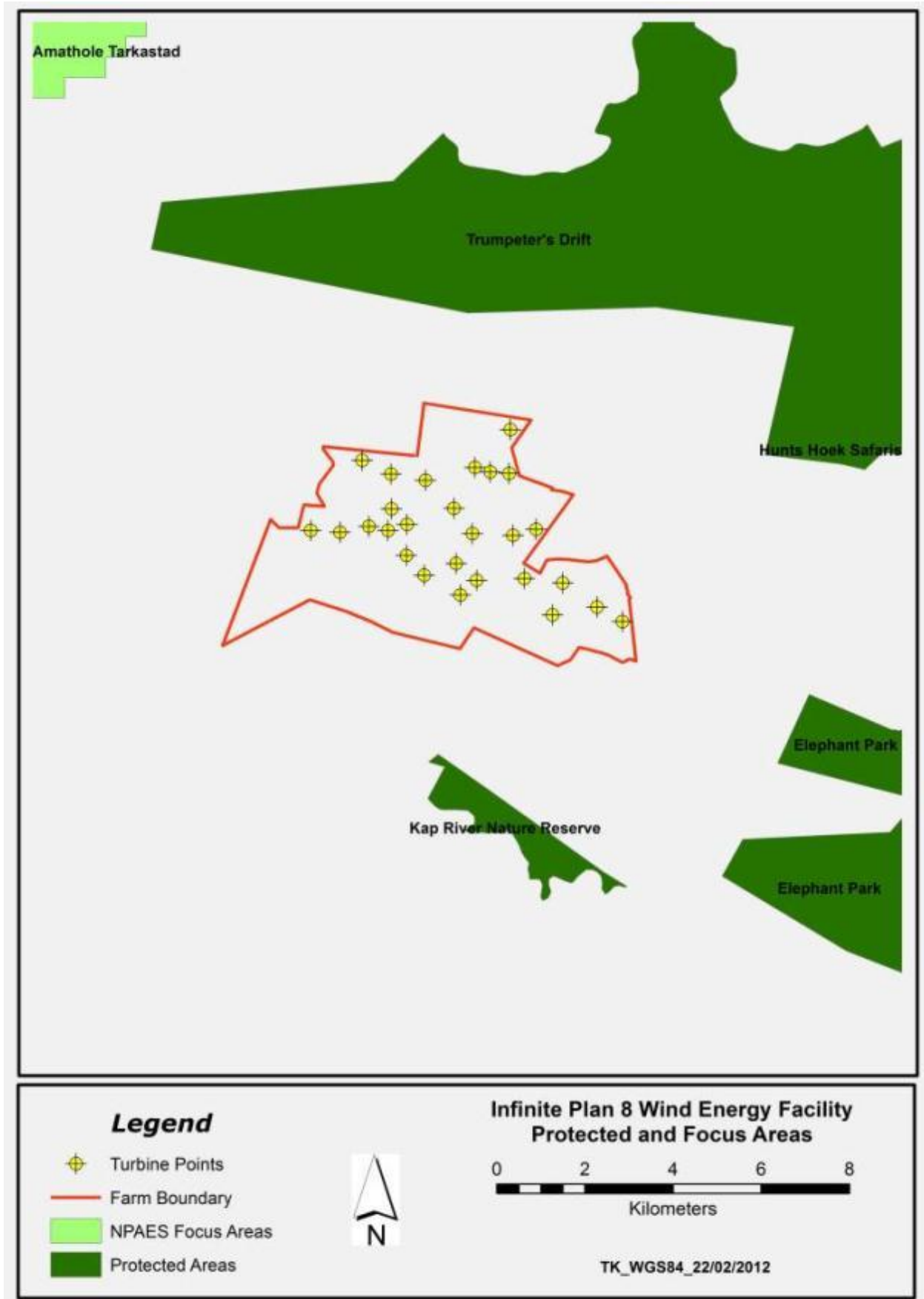


Figure 3-6: Map of the study area in relation to corridors and protected areas as described by the MBCP

Ten principles of land use planning for biodiversity persistence:

- Avoid land use that results in vegetation loss in critical biodiversity areas.
- Maintain large intact natural patches – try to minimise habitat fragmentation in critical biodiversity areas.
- Maintain landscape connections (ecological corridors) that connect critical biodiversity areas.
- Maintain ecological processes at all scales, and avoid or compensate for any effects of land uses on ecological processes.
- Plan for long-term change and unexpected events, in particular those predicted for global climate change.
- Plan for cumulative impacts and knock-on effects.
- Minimise the introduction and spread of non-native species.
- Minimize land use types that reduce ecological resilience (ability to adapt to change), particularly at the level of water catchments.
- Implement land use and land management practices that are compatible with the natural potential of the area.
- Balance opportunity for human and economic development with the requirements for biodiversity persistence.

### **3.6 Heritage characteristics**

#### **3.6.1 Archaeology and heritage structures**

The cultural landscape qualities of the study area essentially consist of a rural area in which the human occupation is made up of a pre-colonial element (Stone Age) as well as a much later colonial (farmer) component. A variety of heritage sites occur in the study area including a cave with rock paintings, burial sites, homesteads and farmsteads. The cave provides evidence of the earliest human habitation while the recent past is linked to white farmers that settled in the region and took up farms.

#### **Cave with Rock Art**

The cave is situated in a gorge and is not readily visible until one is relatively close to it. Within the drip-line the cave is approximately 8 metres in length and about a maximum of 5 metres deep. The most common paintings are hand prints in red ochre. Most paintings are in red or orange ochre and no polychromes were identified. However, the presence of “hook heads” suggests that human faces were probably painted in lighter colours which have since faded. A few depictions of antelope were also noted.

#### **Burial sites**

Two graves were identified in the study region. The graves do not have headstones and consist of rock mounds. These burials, irrespective of whether they were for land owner or farm labourers (with a few exceptions where they were integrated), are family orientated. They therefore serve as important ‘documents’ linking people directly by name to the land.

#### **Homesteads**

The term homestead is used to distinguish this from farmsteads, with the former being occupied by farm labourers. As such there are many more of them in the landscape. Similarly to farmsteads these are complex features in the landscape, being made up of different yet interconnected elements. Typically these consist of a main house that is extended in an ‘organic’ manner as the family expand. The building material used in construction is low technology, based on locally available sources. In addition gardens, outbuildings and sheds are included. An impact on one

element therefore impacts on the whole. Locally it seems as if they can be grouped into two distinct categories. Some of these date to early historic times and were probably erected soon after the farm was formally surveyed. A smaller number date to recent times and have been occupied until recently.

**Farmsteads**

Farmsteads are complex features in the landscape, being made up of different yet interconnected elements. Typically these consist of a main house, gardens, outbuildings, sheds and barns, with some distance from that labourer housing and various cemeteries. In addition roads and tracks, stock pens and wind mills complete the setup. An impact on one element therefore impacts on the whole. Farmsteads in the study area range from those of the first white farmers going back to the 1880s, to contemporary ones. The older ones have been abandoned and are in ruin. Later ones are still in use.

**3.7 Palaeontology**

The area intended for development overlies strata of the Cape Supergroup and lowermost portion of the unconformably overlying Karoo Supergroup. In addition, portions of the Cape Supergroup rocks are capped by relict patches of Silcrete formed as a product of deep leaching during the Cretaceous Period. Specifically, the Witpoort Formation of the Witteberg Group (the uppermost group of three subdivisions within the Cape Supergroup) consists primarily of quartzitic ridges which are not significantly fossiliferous at surface. Potentially important interbedded black shales within the quartzites are kaolinised to a deep depth (Gess, 2011). There is therefore only a low likelihood that palaeontological resources will be discovered/ destroyed as a result of the proposed project.

**3.8 Socio-economic profile**



**Figure 3.7: An indication of the locality of the project; stretching across the boundaries of both the Makana and Ndlambe local municipalities.**

The proposed Plan 8 Grahamstown Wind Energy Project is to be developed in the Makana Local Municipality (MLM). It is approximately 30km outside of Grahamstown along the N2 in an easterly direction towards East London, in the Eastern Cape Province of South Africa. More specifically, the proposed site is on the farms Gilead, Tower Hill and Peynes Kraal, situated approximately 30km east of Grahamstown. The surrounding area is not densely populated. However, it is still highly likely that the development of the project will have direct socio-economic impacts on the municipal



areas and their populations. Accordingly, the discussion that follows provides a brief socio-economic profile of the municipal area, and the neighbouring Ndlambe Local Municipality.

The MLM is located in the Eastern Cape Province and falls within the eastern boundary of the Cacadu District Municipality. The municipal area extends over 4 379 km<sup>2</sup> and is bounded by the cities of Port Elizabeth to the west, and East London to the east. According to the South African Community Survey of 2007 (StatsSA, 2007), the municipality's population declined from an estimation of 75 302 in 2001 to about 70 059 in 2007. The area primarily consists of three nodal points namely Grahamstown, Riebeeck East and Alicedale. Grahamstown is the largest of the nodes both economically and in terms of population size, and serves as the administrative hub. Rhodes University (RU) is a dominant feature in the economic social landscape of the city, and therefore the MLM at large. By contrast, Alicedale is a small town that used to serve as an important national railway juncture in the past, but current economic activity is restricted to tourism primarily in the form of the Bushman Sands Hotel. Lastly, Riebeeck East has traditionally been an agrarian economy, which is still reflected in the current status quo.

The Ndlambe Local Municipality (NLM) borders the project site on the southern side. The municipality is bordered by the MLM within the Cacadu District Municipality to the north, the Sundays River Valley to the west and the Ngqushwa Local Municipality within the Amatole District Municipal Area to the east. The NLM consists of nine wards and extends an area of about 1 840 km<sup>2</sup>, forming part of the Eastern Coastal Zone. To a large degree, the municipal area comprises coastal settlements such as Kenton-on-Sea and Port Alfred, as well as more inland towns such as Bathurst and Alexandria. Although the area has seen a steady growth rate between 1996 to 2001, according to the South African Community Survey of 2007, it is estimated that this municipality's population has declined dramatically from about 54 717 people in 2001 to 46 359 in 2007. The fact that both municipal areas have seen a population decline serves to highlight the need for an economic boost in the area to spur development and produce attractive incentives for additional developers to settle in the area.

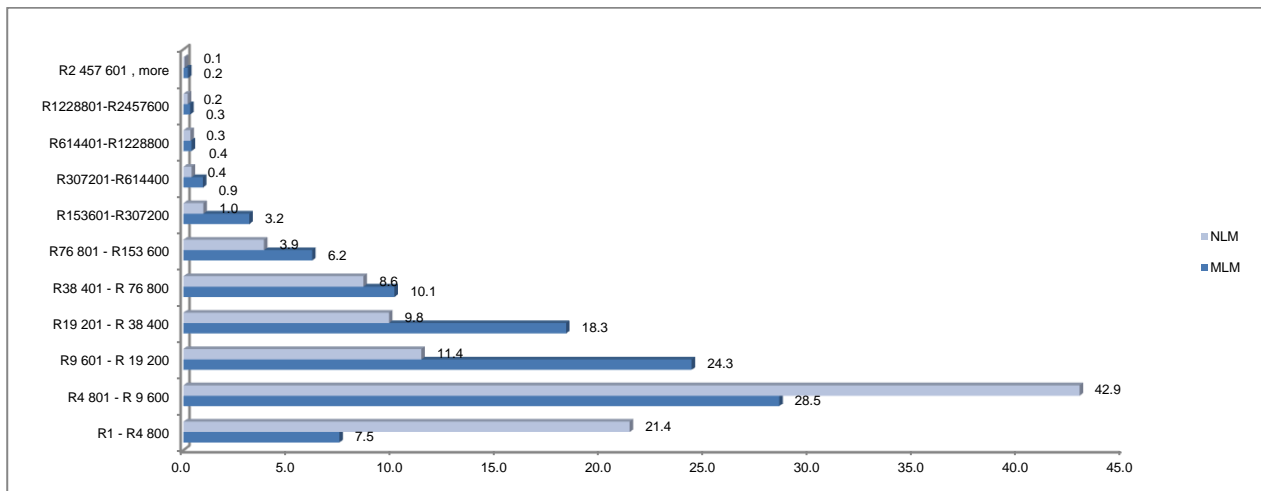
According to the South African Census of 2001 (which provides the most accurate data to date), in terms of age distributions, 68% of the MLM's total population are estimated to be between the ages of 15 and 64. This figure is very similar for the NLM (64%). This is the segment of the population that is considered to be the working age group. These relatively large percentages therefore indicate that the wind farm will be developed in areas where most people are within the working age population, and hence employment opportunities will be needed in the area. Few local employment opportunities, together with the relatively large young age population groups can also explain the population decline in both municipal areas, as youth may be searching for work in different municipal areas. Again, then, the wind farm will undoubtedly economically boost the area with opportunities to be further developed in this and additional fields. Also, various employment opportunities will be created during the construction phase of the development, which is highly needed in these areas.

Education levels have a direct impact on economic development and the quality of life enjoyed by residents of an area. This is because it influences the skills profile and thus the employability of a population. Education affects the potential that workers have, their productivity and also income levels. Education is therefore linked to the economic development of an area. In terms of education, the 2001 census indicates that both municipal areas seem to have a significant percentage of residents who have no schooling. For example, when considering the NLM, about 12% fall in this bracket. This is followed by 16% who have some primary and 5% some secondary school. A low 10% of the population have Grade 12, while only a mere 5% have a higher education. These figures are very similar for the MLM, where approximately 7% have no schooling, 13% some primary school, 5.4% some secondary school and a higher 19% a Grade 12. A significantly low 6% of the population of this municipality have a higher education. These figures are illustrated in the table below.

**Table 3.4: Educational status of the NLM and MLM**

CATEGORY	NLM (%)	MLM (%)
No schooling	11.7	7.3
Some primary	15.7	13.0
Complete primary	4.8	5.4
Some secondary	16.3	19.0
Std 10/Grade 12	9.5	10.3
Higher	5.0	6.3
Unspecified/not applicable	37.0	38.8
<b>TOTAL</b>	<b>100 (%)</b>	<b>100 (%)</b>

As per the 2001 data, employment rates for both districts are low, although higher for the NLM. For example, it is estimated that about 51% of the economically active population of the MLM is employed, while this percentage increases for the NLM, which is about 59%. This data again reinforces the need to create not only employment nodes in the area, but in so doing keep the educated youth in the municipal areas to stimulate the economic sectors of the larger districts. As the wind farm will be supplying electricity and indirectly produce new economic nodes, it is necessary to assess the area’s general standard of living. A good indicator for ‘buying power’ (and hence standard of living) is household income. As can be seen by the figure below, within the NLM, most residents who earn an income earn above R9 601 per month (64.3%). For the same category, this percentage is dramatically lower for the residents of the MLM (36%), of who the largest income earners earn less than R9 601 per month. This therefore indicates that the small portions of the wind farm that will be developed in the jurisdiction of the NLM will be amidst possibly more affluent municipal communities.



**Figure 3.8: Households Income Levels of the NLM and MLM**

The specific employment sectors of these two municipalities need to be considered by the wind farm project to determine its impact on employment sectors and general economic boost on the region. As is illustrated in the table below, the 2001 statistics shows that, of all the employment sectors mentioned for these two municipalities, those related to community services, agricultural work, wholesale and retail and construction are the most predominant. This needs to highlight the fact that the wind farm will most definitely stimulate the construction sector of the region, which is notable as an employment provider. In addition, as the wholesale and retail sectors are also noticeably high, the wind farm will add value in terms of stimulating this sector and providing additional employment opportunities for the region.



**Table 3.5: Employment Sectors of the NLM and MLM**

CATEGORY	NLM (%)	MLM (%)
Community services	31.2	50.9
Agricultural-related work	21.9	17.7
Wholesale, retail	15.7	12.8
Construction	12.6	5.2
Manufacturing	7.7	4.5
Business services	7.5	5.9
Transport, communication	2.7	2.3
Mining, quarrying	0.4	0.1
Elec,gas,water etc.	0.4	0.6
<b>TOTAL</b>	<b>100 (%)</b>	<b>100 (%)</b>

## NEED AND DESIRABILITY ASSESSMENT

In terms of section 31 (2) of the EIA regulations (2010), an environmental impact assessment report must include:-  
 (f) A description of the need and desirability of the proposed activity.....

In accordance with the above-mentioned legislative requirement, this Chapter of the report identifies the need and desirability of the proposed Plan 8 Grahamstown Wind Energy Project. Please note that this has been largely based on information provided by the project proponent. According to Plan 8 (Pty) Ltd the motivation for the proposed project in general terms arose from the following potential benefits:

- **Electricity supply**

The establishment of the proposed Plan 8 Grahamstown Wind Energy Installation will contribute to strengthening the existing electricity grid for the area and will aid the government in achieving its goal of a 30% share of all new power generation being derived from Independent Power Producers (IPP).

- **Social upliftment**

The landowners approached by the Applicant to be part of this wind energy project expressed their commitment to the project in the hope that utilisation of portions of their land for wind turbines will be a source of additional income to supplement their farming income. Plan 8 (Pty) Ltd also intends to identify community development projects, in conjunction with local government, local community organisations and stakeholders, which will be implemented with the aim of improving the socio-economic environment in Makana and Ndlambe Municipalities and the surrounding areas. These initiatives will at least meet the minimum requirements as defined by the Department of Energy in their qualification criteria for independent power producers (IPPs) in South Africa. The project could, amongst other things, contribute to job creation, local economic development, BBBEE employment opportunity, localised enterprise development and community upliftment projects.

- **Climate change:**

Due to concerns over the potential impacts of climate change, and the ongoing exploitation of non-renewable resources, there is increasing international pressure on countries to increase their share of renewable energy generation. The South African Government has recognised the country's high level of renewable energy potential and has placed targets of 10 000GWh of renewable energy by 2013. In order to kick start the renewable energy sector in South Africa, a Feed-in Tariff (Renewable Energy Feed in Tariff or REFIT) for various renewable energy technologies was established. This system was recently amended to allow developers to submit bids for the price of electricity they would accept for their particular renewable energy installation. The resources on this planet are finite and will become more expensive as they get used up. We need coal for many derivative products in our society. As a responsible generation we need to develop technologies which can replace the existing technologies which use the finite fossil fuel resource.

Further, in addition to the above-mentioned benefits, the proposed project site was selected due to:

- Good wind resources suitable for the installation of a large wind energy facility.
- Proximity to connectivity opportunities such as the High Voltage (HV) overhead lines traversing the proposed development site. This allows for the siting of a project substation immediately adjacent to the 132 kV powerlines, thereby significantly reducing the length of powerline required for the point of interconnection to the national Eskom grid.
- The surrounding area is not densely populated.
- There is potential and appetite within the Makana Local Municipality (MLM) to engage with new technologies and industries.
- Proximity of the site to the N2 and the Port of Port Elizabeth.

## ALTERNATIVES

In terms of section 31 (2) of the EIA regulations (2010), *an environmental impact assessment report must include:-*

- (g) *A description of identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity.*
- (i) *A description and comparative assessment of all alternatives identified during the environmental impact assessment process.*

One of the objectives of an EIA is to investigate alternatives to the proposed project. There are two types of alternatives - Fundamental Alternatives and Incremental Alternatives.

The EIA regulations define 'alternatives' as, "*different means of meeting the general purpose and requirements of the activity*" which includes alternatives to:

- (a) The property on which or location where it is proposed to undertake the activity;
- (b) The type of activity to be undertaken;
- (c) The design or layout of the activity;
- (d) The technology to be used in the activity; and
- (e) The operational aspects of the activity.

### 5.1 Fundamental alternatives

Fundamental alternatives are developments that are totally different from the proposed project and usually involve a different type of development on the proposed site, or a different location for the proposed development.

#### ***A different type of development***

Since the core business area of the project proponent is the development of wind energy facilities, the fundamental alternative of a development other than the proposed facility is therefore neither feasible nor reasonable in this case, and will not be considered further in the EIA.

#### ***A different location***

By virtue of the fact that Plan 8 is currently undertaking numerous environmental impact assessments across South Africa, they are undertaking assessments of different locations for proposed wind energy facilities. The main determinants in selecting the proposed location were:-

- Wind speed;
- Proximity to a grid connection point, and;
- Available land.

Preliminary investigations have identified that the proposed project site meets these criteria and so different locations for the current project will not be considered. The connectivity to the grid is a critical factor to the overall feasibility of the project.

This location was pre-selected by Plan 8 from other potential sites in and around the Western, Eastern and Northern Cape Provinces.

In this regard, a study was conducted by Plan 8, prior to commencement of the EIA, to consider, *inter alia*, the anticipated risks associated with securing the obligatory environmental authorisations and other associated permitting and licensing requirements that are potentially applicable for each of the site alternatives. This study was a desktop study, which considered various parameters. These parameters are:

- Wind speed ;
- Annual average energy production ;
- Logistics (availability of existing access roads, ease of transportation of equipment from ports, etc);
- Environmental sensitivity;
- Botanical features of the site;
- Fauna (including avifauna and bats);
- Proximity to rivers and dams;
- Proximity to residential areas;
- Visual;
- Noise;
- Flicker (the rotating blades of turbines cause shadows which ‘flicker’);
- Proximity to transmission and distribution grid and the ability of the grid to absorb evacuated power;
- Proximity to railways, roads, coast-line and mines (a minimum distance is required);
- Civil aviation requirements;
- Heritage of the area;
- Radio and cellular communications networks, and
- Overhead telephone communications networks.

For each potential site, desktop studies are produced, rating the above parameters. The parameters hold equal weight. Parameters are rated according to statutory requirements and documented best practice guidelines. Note that many of the statutory requirements and documented best practice guidelines in South Africa are in a draft state, owing to the fact that wind energy is a new technology in the South African context. Where no guidelines exist, German requirements are used by Plan 8, owing to the advanced state of the wind industry in Germany. Plan 8 requires that each parameter is satisfactory in meeting statutory requirements and documented best practices guidelines and that there are no fatal flaws or significant issues, prior to pursuing a project. Sites are then compared and the most favourable selected. The 70/30 apportionment in bid criteria demanded a site selection focus on highest need for socio-economic ‘upliftment’. Bearing all of the above in mind, Plan 8 identified 29 sites and is currently pursuing 3 sites, of which this proposed site is one. With regard to electricity distribution infrastructure, there is an existing 132 kV transmission line traversing the site.

## 5.2 Incremental alternatives

Incremental alternatives are modifications or variations to the design of a project that provide different options to reduce or minimise environmental impacts. There are several incremental alternatives that can be considered, including:

- The design or layout of the activity
- The technology to be used in the activity
- The operational aspects of the activity

## 5.3 Design/Layout Alternatives

At the start of the Scoping phase of this assessment Plan 8 intended to install a maximum of 32 turbines on the project site. This number was subsequently reduced to a maximum of 27 turbines – the number that was reported in the Final Scoping Report and in this EIR – as a result of technical considerations (such as quality of wind resources, steepness of slopes and difficulty of access), as well as environmental and social concerns that arose during the Scoping phase.

The layout presented in this report, although it remains “preliminary” until more detailed investigations are carried out post-environmental authorisation, therefore represents the optimal layout both from a technical standpoint, and from the perspective of environmental and social considerations. Accordingly no alternative layout options have been considered in this report because of the iterative nature of developing site layout plans.

Prior to the commencement of construction activity, should the project be authorised, Plan 8 (Pty) Ltd will be required to provide the competent authority (DEA) with a final layout informed by detailed geotechnical investigations, bird and bat monitoring, and detailed vegetation surveys of all turbine locations.

#### **5.4 Technology Alternatives**

The nature of the proponent’s business is to develop wind energy projects. As such, no alternative power-generating technologies were considered as part of this study.

Final selection of the specific make and design of turbine will be informed by the final analysis of wind resources to optimise power production potential.

#### **5.5 Scheduling Alternatives**

The Department of Energy’s requirement that all renewable energy projects are operational by the end of 2016 means that construction will need to commence as soon as possible after all relevant approvals have been obtained. Under these circumstances there will be very little flexibility in rescheduling the project timelines.

#### **5.6 The ‘NO-GO’ alternative**

According to the EIA Regulations, the option of doing nothing i.e. not proceeding with the proposed development (the No Go Option) must be assessed during the EIA. The impacts of not proceeding with the project have been assessed and are reported in this EIR.

The implications of the No-Go option are discussed in detail in section 8.2.

## KEY FINDINGS OF THE SPECIALIST STUDIES

In terms of section 31 (2) of the EIA regulations (2010), an *environmental impact assessment report must include:*

(j) *A summary of the findings and recommendations of any specialist report or report on a specialised process*

### 6.1 Ecological Impact Assessment

**Wetlands and rivers** constitute features of conservation concern as they are process areas. They are essential for ecosystem function and process and provide niche habitats for a variety of plants and animals.

**Steep slopes and rocky areas** also constitute important features for conservation concern as they provide areas that are difficult to rehabilitate and are easily affected by changes in land use, with erosion being an important impact factor. The results of the sensitivity assessment have been summarised into one habitat sensitivity map for the study area (Figure 8-1). The vegetation sample sites within the study area were identified and assessed in terms of the sensitivity criteria described in the specialist report.

#### Low sensitivity

Low sensitivity is given to areas that are highly impacted by current land use and thus highly degraded and provide no value to the ecosystem and are highly unlikely to harbour any species of special concern.

#### Medium sensitivity

Medium sensitivity is given to areas that, despite being somewhat degraded, still provide a valuable contribution to biodiversity and ecosystem functioning as they are not very degraded and have a relatively high species richness, these areas may also contain species of special concern.

Careful attention should be placed on having as little impact as possible on these areas as they may still form a valuable role in ecosystem functioning.

#### High sensitivity

Areas of high sensitivity include process areas such as rivers, wetlands and streams that are important for ecosystem functioning including surface and ground water as well as animal and plant dispersal. High sensitivity is also given to areas that have high species richness and are not hugely impacted by current land use and are not degraded. High sensitivity areas also contain the majority of species of special concern found in the area. As wind farms have very little impact on the vegetation post construction, it may be possible to retain the areas of moderate sensitivity as corridor areas.

It should be noted that the presiding sensitivity was based on the flora and vegetation as the vegetation units, representing habitats, and show varying degrees of ecological integrity and that these values directly influenced the impact rating scores.



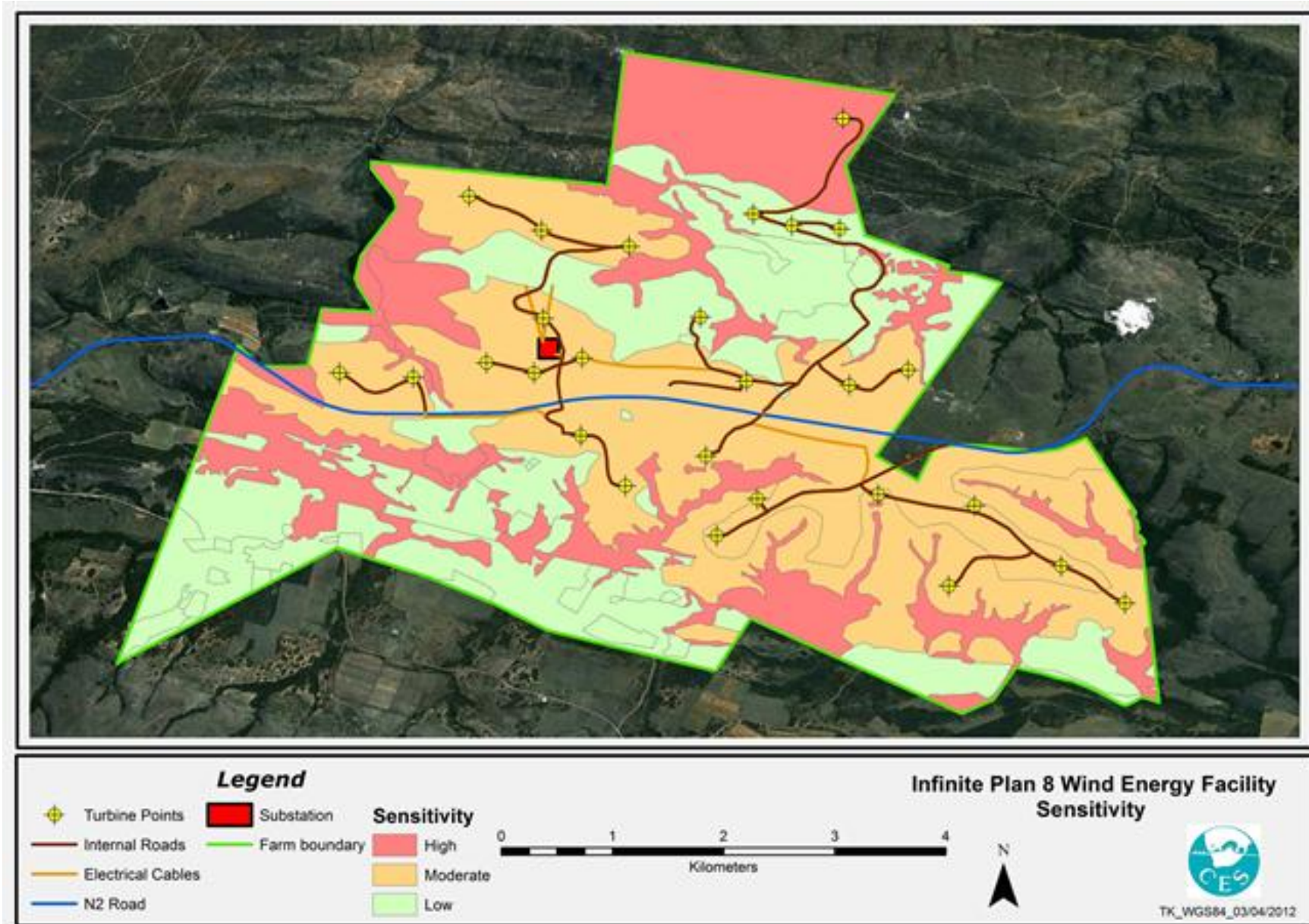


Figure 6-1: Map of the proposed wind energy facility showing the varying sensitivity of the site

## 6.2 Avifauna Impact Assessment

Avoiding areas of high bird use or sensitivity is the most important means of mitigating the effects of wind turbines (and associated infrastructure) on birds. At this proposed site it is difficult to identify any areas of truly high sensitivity. With the exception of the small drainage lines, which sometimes contain small dams and wetlands, as well as pristine thicket and woodland, the site is relatively uniform in sensitivity. This study has classed the study area into medium and low sensitivity areas. The medium sensitivity areas are mostly the drainage lines, and steep ground immediately adjacent to them. Construction of infrastructure should take place only within the low sensitivity areas. The delineation of these sensitivity zones in this report should be interpreted as indicative only. The exact edge of these zones cannot always be drawn as a line on a map, and is better determined on site in the EMP phase if there are any areas of conflict. Several current turbine positions fall within the medium sensitivity areas, but only slightly. These turbines should ideally be moved into low sensitivity areas, although this would best be done during the EMP, or after pre-construction monitoring has produced some useful data in order to inform the new placement.

The site is on the plateau of a minor ridge line, with the ground falling away to the north and south. The areas where turbines are currently planned are predominantly relatively flat and with open vegetation. Numerous small drainage lines drain from the plateau down into the valleys. Most of the site is classified as “Bhisho Thornveld”.

Up to 229 bird species could occur on site (Harrison et al, 1997), with 13 of these species being Red Listed by Barnes (2000). Of these species, the following have been selected as the ‘target species’ for this study, i.e. those species for which there is special concern related to the proposed WEF: African Crowned Eagle *Stephanoaetus coronatus*; African Fish-Eagle *Haliaeetus vocifer*; African Marsh-Harrier *Circus ranivorus*; Black Harrier *Circus maurus*; Black Sparrowhawk *Accipiter melanoleucus*; Black Stork *Ciconia nigra*; Black-shouldered Kite *Elanus caeruleus*; Black-winged Lapwing *Vanellus melanopterus*; Booted Eagle *Aquila pennatus*; Denham's Bustard *Neotis denhami*; Jackal Buzzard *Buteo rufofuscus*; Lanner Falcon *Falco biarmicus*; Marsh Owl *Asio capensis*; Martial Eagle *Polemaetus bellicosus*; Rufous-chested Sparrowhawk *Accipiter rufiventris*; Secretarybird *Sagittarius serpentarius*; Spotted Eagle Owl *Bubo africanus*; Steppe Buzzard *Buteo vulpinus*; Verreaux's Eagle *Aquila verreauxii*; Verreaux's Eagle-Owl *Bubo lacteus*; White Stork *Ciconiaciconia*; White-bellied Korhaan *Eupodotis senegalensis*; Yellow-billed Kite *Milvus migrans*; and African Harrier-Hawk *Polyboroides typus*. There is some doubt as to whether these species all occur on or near the proposed site. Their occurrence will need to be confirmed during the pre-construction monitoring programme.

The expected interactions between birds and the proposed WEF are: disturbance of birds and habitat destruction during construction and maintenance of the facility and associated infrastructure; displacement of birds from the area, or from flying over the area; collision of birds with turbine blades during operation; and collision and electrocution of birds on associated electrical infrastructure. With respect to the assessment of these potential impacts for the Grahamstown project, the following are key findings:

- The two impacts that are determined to be of medium or higher significance are collision of birds with turbine blades, and collision and electrocution on power lines. Since we have no data on bird abundance and movement on site, our confidence in the assessment of these impacts is relatively low. This could be rectified by obtaining primary data on site. It is therefore essential that a preconstruction bird monitoring program be initiated as soon as possible in order to begin the process of collecting relevant and accurate data on the numbers of birds that could be affected by the project.
- The remaining impacts such as disturbance and habitat destruction have been judged to be of low significance due to the relatively small amount of habitat destruction that will take place (especially when related to the target species, which mostly have large territories).

- Micro-siting of turbines and other infrastructure within the proposed site remains the foremost means of mitigating impacts on birds. This study has mapped the avifaunal sensitivity of the study area, and classed it into medium and low sensitivity areas. The medium sensitivity areas are mostly the drainage lines, and steep ground immediately adjacent to them. Construction of infrastructure should take place only within the low sensitivity areas. The delineation of these sensitivity zones in this report should be interpreted as indicative. The exact edge of these zones cannot always be drawn as a line on a map, and is better determined on site in the EMP phase if there are any areas of conflict.
- Since the exact position of turbines and other infrastructure has not yet been finalized, a site specific avifaunal Environmental Management Plan is seen as essential.

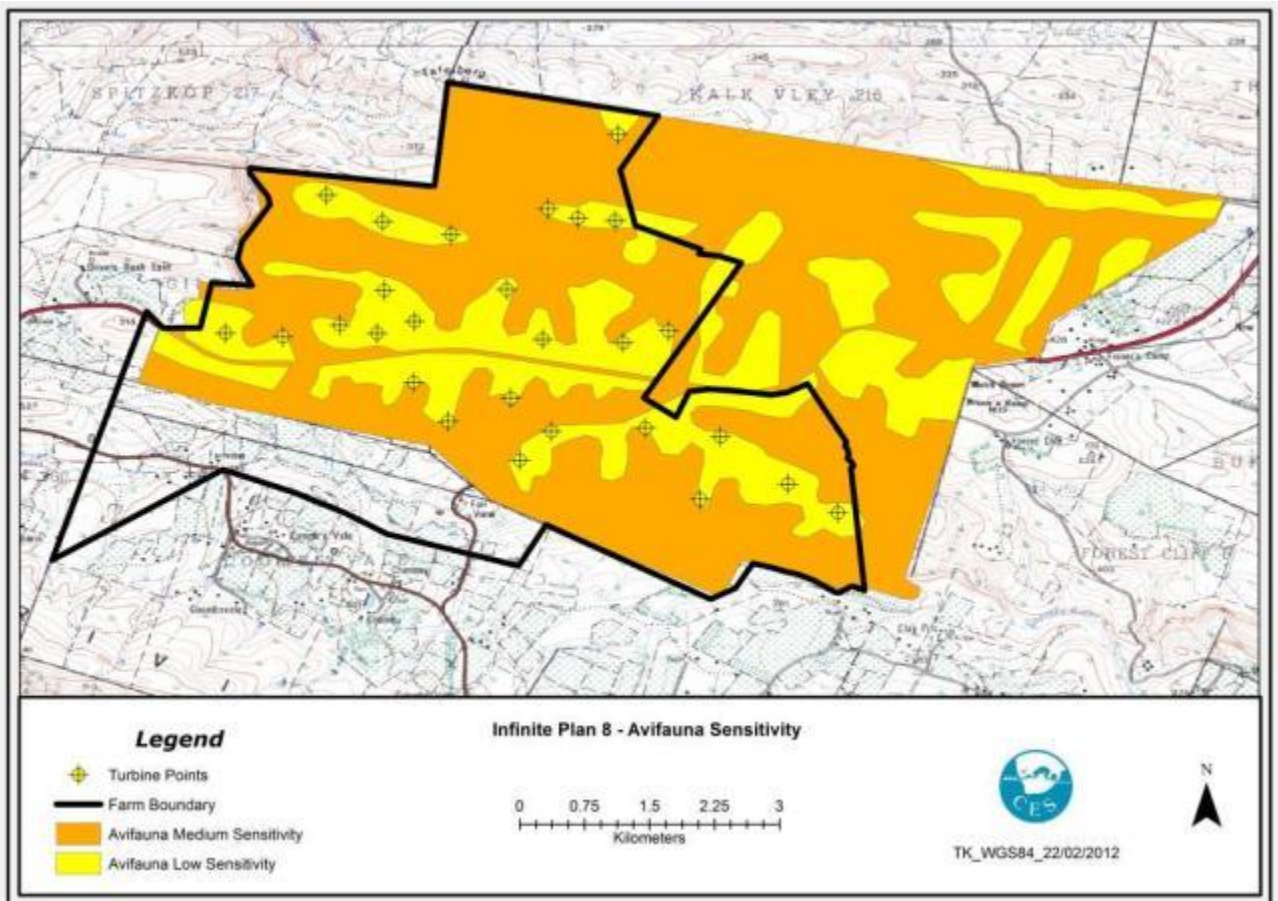


Figure 6-2: Avifaunal sensitivity map for the proposed project.

### 6.3 Bat (Chiroptera) Impact Assessment

The general bat activity in the project area is moderate and higher concentrations exist in certain areas such as the lower parts, valleys and drainage lines. These areas can draw elevated numbers of insects and will therefore be utilised by bats. High flying species such as *Tadarida aegyptiaca* and *Miniopterus natalensis* are the most at risk by wind turbines. These species will readily pass through, and even forage to some degree, in high lying areas where winds are stronger and insects less, motivating further for the implementation of mitigation measures.

The small watercourses and sheltered valleys have been assigned a 150 m buffer. These buffer areas should be treated as sensitive and no turbines should be allowed to be placed in the buffers. The areas marked as having a Moderate Sensitivity are assigned as such due to topography and a higher amount of roosting space offered by the terrain in that area. Turbines located in the



Moderate Sensitivity area should be prioritised during mitigation measures and must receive special attention during monitoring, although all turbines in the project area are subject to mitigation measures.

Since the possibility of the site being located in a migration path still exists, it is recommended that a long-term pre-construction monitoring study be undertaken to determine whether migrating cave bats may be at risk by the proposed wind farm. It is recommended that the curtailment mitigation measure be implemented on all turbines on the site, based on correlations found between wind speed and bat activities during the long-term study.

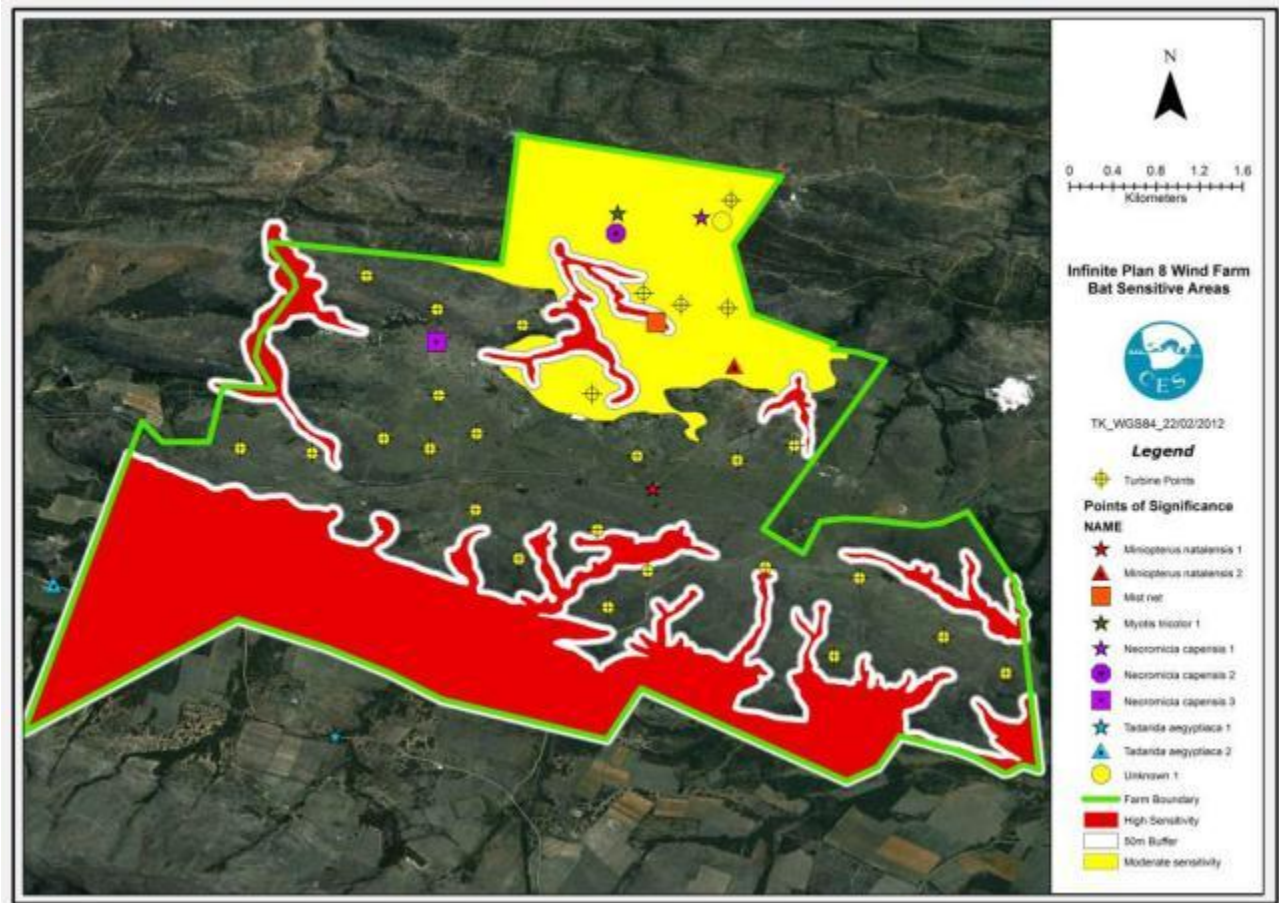


Figure 6-3: Bat sensitivity map

#### 6.4 Heritage Impact Assessment

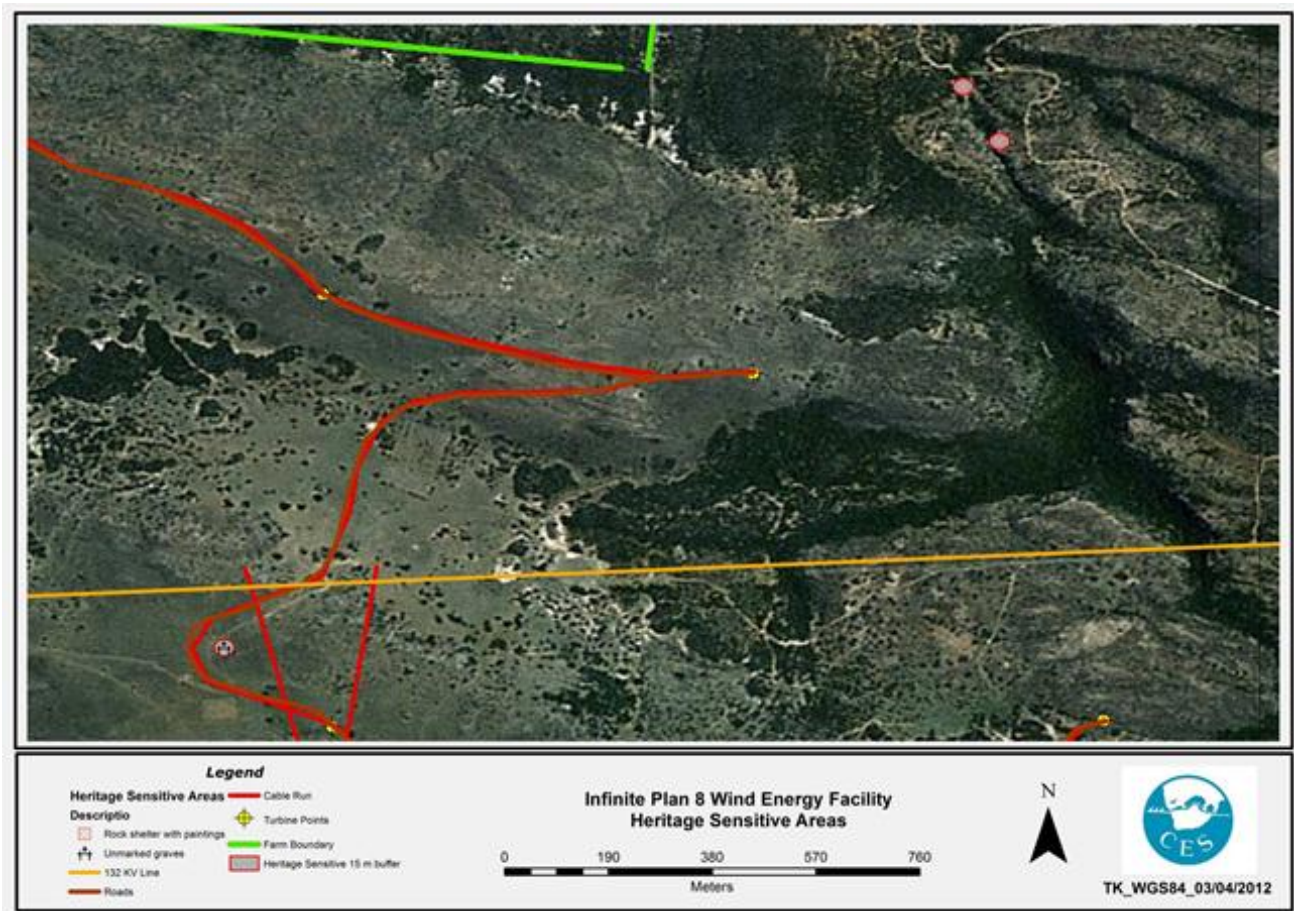
The cultural landscape qualities of the study area essentially consist of a rural area in which the human occupation is made up of a pre-colonial element (Stone Age) as well as a much later colonial (farmer) component. Apart from two unmarked graves and an old horse/oxen drawn plough, no material culture or structural remains of historical significance were observed in the studied area. Two isolated artefacts of Stone Age origin were recorded and a cave with rock paintings occurs in one of the gorges.

The survey indicated that, for the current turbine layout, none of the identified sensitive heritage sites would be impacted. A 15m buffer (Figure 8-4) is recommended around the two grave sites as well as perimeter fencing to exclude movement across the sites. Although the current access road layout falls within 50m of the grave sites, it will not impact the sites provided the recommendations for that site are observed.

From a heritage point of view it is recommended that the proposed development be allowed to continue, however this is subject to the following to conditions:

- Surveyed areas (walk tracks) – with the exception of waypoints 1 and 34-35 (Figure 8-4) – are suitable for the proposed activities,
- Any areas outside the surveyed tracts might be archaeologically sensitive and therefore, placement of any activities outside the studied areas will require further archaeological investigation and assessment,
- Once the final layout and placement of wind turbines and associated facilities and services are determined, an Archaeological Impact Assessment focusing on the affected areas should be undertaken.

Should the archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.



**Figure 6-4: Heritage sensitivity map, indicating the location of the identified heritage sites, with 15m buffer zone.**

\*Please refer to figure 8.1 to see where these sites are located in relation to the project boundary.

### 6.5 Palaeontological Impact Assessment

The area intended for development overlies strata of the upper portion of the Cape Supergroup and lowermost portion of the unconformably overlying Karoo Supergroup. In addition, portions of the Cape Supergroup rocks are capped by relict patches of Silcrete formed as a product of deep leaching during the Cretaceous. Cape Supergroup rocks represent sediments deposited in the

Agulhas Sea, which had opened to the south of the current southern African landmass, in response to early rifting between Africa and South America during the Ordovician.

The Witteberg Group is the uppermost of three subdivisions of the Cape supergroup and was laid down during the Late Devonian. During the Cretaceous and early Tertiary Periods much of Africa was weathered down to a number of level horizons collectively known as the African Surface. The area in the vicinity of Grahamstown was reduced to a flat plain close to sea level, remnants of which are referred to as the Grahamstown Peneplane. During the Tertiary, mudstones, shales and diamictites were leached to considerable depth, transforming them into soft white kaolin clay. Silica, iron and magnesium from these rocks was carried in solution by groundwater and deposited near the ground surface due to steady evaporation of mineral rich waters. This led to the formation of a hard mineralised capping layer, often consisting of silicified soil. Resultant silcretes are referred to as the Grahamstown Formation. Though occasional occurrences of root and stem impressions have been recorded from the Grahamstown Formation, it is generally considered unfossiliferous.

However, should substantial fossil remains be encountered or exposed during construction, the Environmental Control Officer (ECO) should safeguard these, preferably *in situ*, and alert SAHRA as soon as possible so that appropriate action (e.g. recording, sampling or collection) can be taken by a professional palaeontologist.

## 6.6 Visual Impact Assessment

There are several sensitive visual receptors on surrounding farms which may be affected by the proposed wind farm development, but their current views are likely to contain elements which reduce the quality of these views. The agricultural activities in the region have affected the quality of the landscape and the quality of views, as have the high-voltage power lines and pylons. Although a wind farm will have a significant initial impact on views due mostly to the novelty of wind farms in South Africa, it is likely that in the long run viewers will experience them as positive rather than negative additions to the landscape when compared with the power stations and coal mines which exist in the broader landscape.

The following key findings were made from the Visual Impact Assessment which had the following limitations and assumptions:

### 6.6.1 Visibility

Cumulative viewsheds (Figure 6-5) indicate not only where a feature is visible from but also how much of the feature will be visible from that point or area. As expected, the visibility is high in terms of area due to the turbine heights and their location on relatively elevated land.

The map in Figure 6-5 shows the spatial extent of areas with views on the wind farm. In terms of the potential visibility the colour red indicates areas where views of the wind farm will contain most of the wind turbines (potentially all the turbines). Green lines on the map show positions of protected areas. The viewshed calculation does not take into account distance from the wind farm, which is discussed in the section on visual exposure, and is not a direct reflection of visual impact.

### 6.6.2 Sensitive Viewers and Viewpoints

Viewer sensitivity is the assessment of the receptivity of viewer groups to the visible landscape elements and visual character and their perception of visual quality and value.

The sensitivity of viewer groups depends on their activity and awareness within the affected landscape, their preferences, preconceptions and their opinions.



The following sensitive viewers or viewpoints were identified:

1. Viewpoints in surrounding protected areas;
2. Tourists and visitors to protected areas;
3. Residents on surrounding farms;
4. Motorists using the N2 and other main roads in the region;
5. Residents of rural villages.

### **Residents of surrounding farms**

Residents' views will be affected according to their visual exposure to the wind farm and the quality of their existing views and are therefore highly sensitive.

### **Scenic viewpoints and users of recreational trails**

Viewpoints on farms in the surrounding landscape with scenic views can potentially be affected by the wind farm development. There are farms in the region with eco-trails which visitors can follow and viewpoints along these trails may include views of the wind farm.

### **Protected areas**

There are a number of protected areas in the region which can potentially be affected by the proposed wind farm. These include a number of protected areas classified as Type 1 below, such as Great Fish River Complex, Double Drift Nature Reserve, Kap River Nature Reserve and Water's Meeting Nature Reserve.

### **Residents of rural villages**

The rural villages north and east of the Great Fish River are likely to have views of the wind farm. They tend to be further than 10km from the proposed wind farm, but residents will potentially see most of the turbines in the wind farm.

### **Motorists**

The N2 passes through the proposed site and is very likely to be affected. The R67 north of Grahamstown is more than 15km from the site and so is unlikely to be much affected. According to the visibility analysis the R67 east of Grahamstown will afford very few opportunities to see the wind farm if at all.

### **6.6.3 Visual Exposure**

Visual exposure refers to the relative visibility of a project or feature in the landscape (Oberholzer, 2005). Exposure and visual impact tend to diminish exponentially with distance. The exposure is classified as follows:

- High exposure – dominant or clearly noticeable;
- Moderate exposure – recognisable to the viewer;
- Low exposure – not particularly noticeable to the viewer

Visual exposure for residents of surrounding farms and motorists on sections of the N2 will be high, moderate to high for some areas within Trumpeter's Drift, Elephant Park and Kap River nature reserve and low for residents of rural villages and surrounding urban areas more than 10km away.



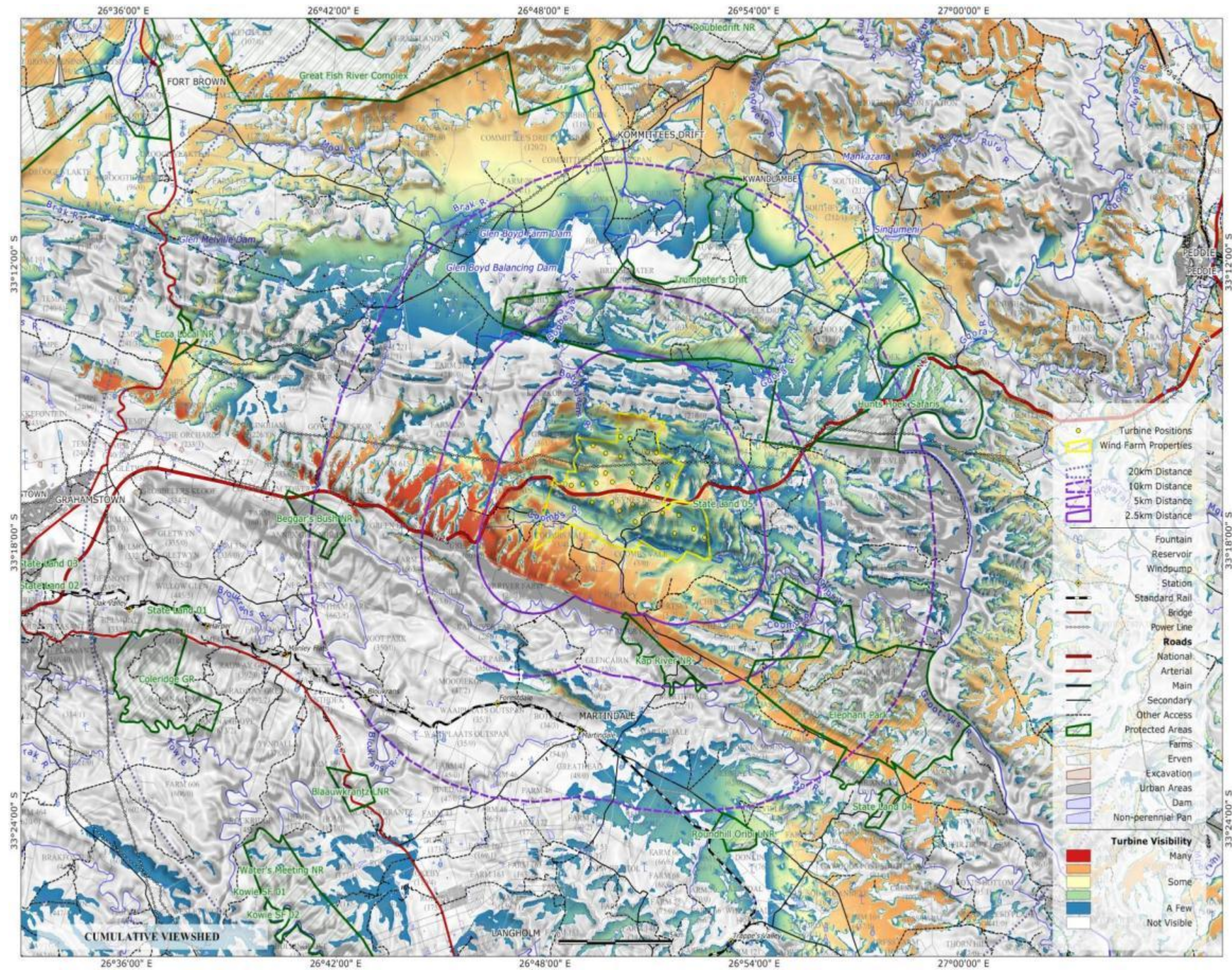


Figure 6-5: Map showing the cumulative viewshed for the wind farm

Shades of red indicate areas where views of the wind farm will contain most of the wind turbines (potentially all the turbines). Green lines on the map show positions of protected areas.



The European Wind Energy Association (EWEA) also suggests zones of theoretical visibility (ZTV) as follows (EWEA, 2009):

- Zone I – Visually dominant: turbines are perceived as large scale and movement of blades is obvious. The immediate landscape is altered. Distance up to 2km.
- Zone II – Visually intrusive: the turbines are important elements on the landscape and are clearly perceived. Blade movement is clearly visible and can attract the eye. Turbines not necessarily dominant points in the view. Distance between 1 and 4.5km in good visibility conditions.
- Zone III – Noticeable: the turbines are clearly visible but not intrusive. The wind farm is noticeable as an element in the landscape. Movement of blades is visible in good visibility conditions but the turbines appear small in the overall view. Distance between 2 and 8km depending on weather conditions.
- Zone IV – Element within distant landscape: the apparent size of the turbines is very small. Turbines are like any other element in the landscape. Movement of blades is generally indiscernible. Distance of over 7km.

The zones overlap due to the fact that they attempt to incorporate atmospheric or weather conditions. The maps in this section do not show these zones but distance buffers are included to enable readers to apply the EWEA classification.

Visual exposure was calculated using visibility (i.e. how much of the wind farm will be visible) and distance from the nearest wind turbine.

### **Residents of surrounding urban areas**

Urban centres and rural villages are all further than 10km from the proposed site and as such residents will experience **low** visual exposure to the development.

### **Protected Areas and Scenic Viewpoints**

The protected natural areas that may be exposed to the visual impact of the project are presented in the Visual Impact Report. Most protected areas are rated on average to have **low** visual exposure to the development. There may however be areas within these where viewpoints will have medium or high visual exposure. This is particularly true of Elephant Park game farm where some regions in the west have **medium** to **high** visual exposure. Parts of Trumpeter's Drift game farm will experience **medium** visual exposure. The ridge north of Kap River nature reserve shows **high** visual exposure ratings and on the map a small part of this ridge is shown to fall within the reserve, hence the high visual exposure rating for the reserve. However, there do not appear to be tracks or roads in this section of the Kap River reserve and access will probably be limited.

### **Motorists**

The N2 is the only major road in the Study Area which will have sections of high visual exposure where motorists will be in close proximity to the wind farm and will potentially have good views of turbines. It should be noted, however, that much of the section of N2 that passes through the wind farm site has tall trees next to the road which will limit views considerably.

### **Residents on farms**

Table 6.1 lists buildings on farms surrounding the wind energy facility with high visual exposure ratings. There are a number of buildings with high visual exposure ratings and most of these are located on the ridge just south of the proposed site.



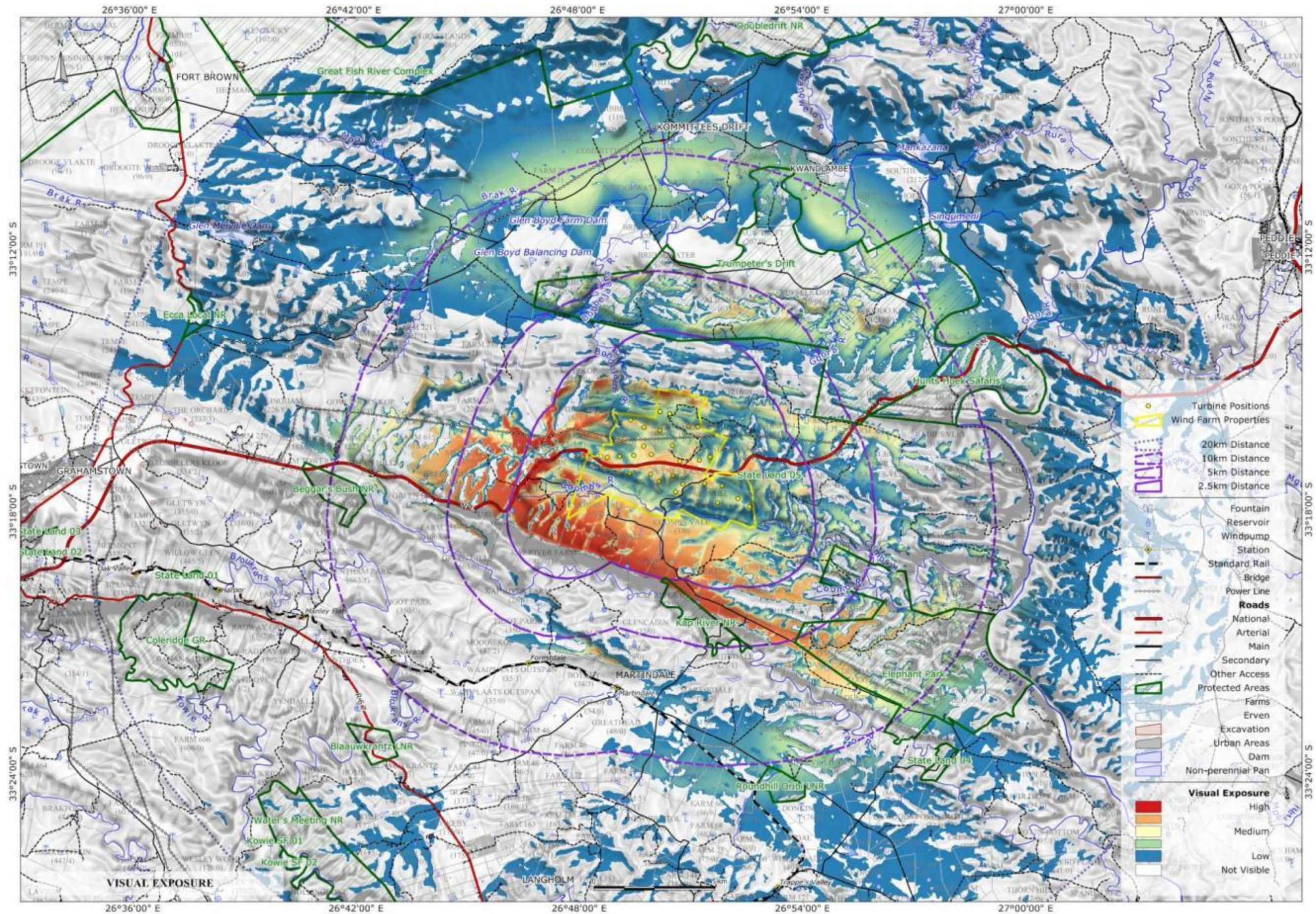


Figure 6-6: Visual exposure calculated from visibility and distance from nearest turbine.



#### 6.6.4 Visual Intrusion

Visual intrusion indicates the level of compatibility or congruence of the project with the particular qualities of the area – its sense of place. This is related to the idea of context and maintaining the integrity of the landscape (Oberholzer, 2005). It can be ranked as follows:

- High – results in a noticeable change or is discordant with the surroundings;
- Moderate – partially fits into the surroundings, but is clearly noticeable;
- Low – minimal change or blends in well with the surroundings.

Sense of place is defined by (Oberholzer, 2005) as: 'The unique quality or character of a place... relates to uniqueness, distinctiveness or strong identity.' It describes the distinct quality of an area that makes it memorable to the observer.

#### Residents of surrounding urban areas

The only urban areas that will potentially be affected by the wind farm are the rural villages north of the Fish River (e.g. Kwandlambe and Kommittee's Drift on the map). They are located beyond 10km from the proposed wind farm site, but residents will potentially have views of the wind farm on the distant, mountainous horizon towards the south. There are obviously no other structures of a similar size as the wind turbines in view from these villages and as such they may well be clearly noticeable. The fact that these turbines will be exposed above the skyline and will have moving rotors will ensure that they will be noticed. However, their distance from the villages will reduce the intrusion effect and a **moderate** to **low** visual intrusion is expected.

#### Protected Areas and Scenic Viewpoints

There are several game farms in the region which will potentially be affected by the wind farm. Although there are communication towers on many hills, some power lines and pylons, and often large farm buildings and homesteads in views, there are no structures comparable to wind turbines in the landscape. There is potential for scenic views of the hills/mountains on which the turbines will be located, especially from viewpoints north of the proposed site (e.g. from viewpoints within Trumpeter's Drift a). The level of intrusion will depend on the distance between the viewpoint and the turbines. Views from south of the proposed site tend to have less scenic potential due to the more noticeable effects of farming in this region, although viewpoints closer to the proposed site will also be more affected. It is debatable whether a wind farm is discordant with the landscape (since wind farms are an attempt to develop energy in an ecologically and environmentally sustainable way), but initially the landscape change will be highly noticeable. A **moderate** to **high** visual intrusion is expected for some game farms in the region

#### Residents on farms

Many, if not most, farms in the region have been converted to game farms or eco-tourism areas and as such most of the discussion in the previous paragraph applies. In general, though, wind farms are often located on agricultural land internationally and are therefore seen as congruent with the landscape. The visual intrusion rating will therefore depend on visual exposure to the wind farm and will range from **low** to **moderate** for residents and viewpoints from surrounding farms

#### Motorists

The N2 passes through the proposed wind farm site and motorists will pass in close proximity to wind turbines. There are parts of this section of road where tall trees will obscure views of wind turbines.

**Table 6-1: Summary of the visual impacts**

<i>Criteria</i>	<i>Impact</i>
<b>Viewer Sensitivity</b>	Residents of urban areas and rural villages – <b>Highly sensitive</b> to changes in their views. Residents on surrounding farms – <b>Highly sensitive</b> Scenic viewpoints and protected areas – <b>Highly sensitive</b> – there are no recognised viewpoints protected for their scenic quality in the region. Motorists – <b>Low sensitivity</b> due to short exposure time and the fact that their focus on landscape is reduced.
<b>Visibility of Development</b>	<b>High</b> due to the tall structures and their position in the topography.
<b>Visual Exposure</b>	Residents of surrounding urban areas and rural villages – <b>Low</b> since these are more than 10km from the proposed site. Residents on surrounding farms – <b>high visual exposure</b> for a number of farm residences or buildings. Protected areas and scenic viewpoints – <b>moderate to high</b> for some areas within Elephant Park and Trumpeter’s Drift game farms, and Kap River nature reserve. Motorists – <b>high</b> for sections of the N2.
<b>Visual Intrusion</b>	Residents of rural villages – <b>moderate to low</b> due to their distance from the wind farm site. Protected areas – <b>moderate to high</b> for some game farms in the region. Residents on surrounding farms – <b>moderate to low</b> since wind farms are seen as compatible with agricultural landscapes internationally. Motorists – <b>High</b> for a short time when in close proximity.

**6.6.5 Shadow Flicker**

Fifteen buildings were identified as potentially at risk of being affected by shadow flicker. These building localities were taken from a national database of buildings which Eskom derived from SPOT 5 satellite images using remote sensing techniques (de la Rey 2008; Mudau 2010). All fifteen sites were visited to verify that they are buildings and to determine whether existing surrounding vegetation will reduce the risk of shadow flicker affecting residents.

Shadow flicker modelling was conducted using these sites and the results are shown in Table 6-2 for sites shown in Figure 6-7. Parameters used for modelling purposes represent a ‘worst case’ scenario. In essence this means that it is assumed that the sun is shining for the whole day (no clouds or atmospheric variation), that the building under investigation has windows for walls (from 1m up to the roof) and that the wind turbine rotor is always perpendicular to the line from turbine to sun (i.e. largest shadow effect). These are standard international assumptions used when calculating the potential risk of shadow flicker from wind turbines (Parsons Brinckerhoff 2011) and actual shadow flicker hours will be much lower than model results. A Nordex N100 wind turbine with hub height of 100m and rotor diameter of 99.8m was used to model wind turbines.

According to international guidelines buildings that are affected by more than 30 hours/year, or 30 minutes on the worst affected day, of shadow flicker should be mitigated for (Parsons Brinckerhoff 2011). From the results shown below it is clear that of the actual buildings identified only the farmstead at Coombs Vale (3/1), labelled L on the map, is at risk for more than this threshold (36 hours/year or 35 minutes on the worst affected day). Since the model represents a ‘worst case’ scenario as set out above, it is safe to say that it is unlikely that the actual number of hours will be this high. The house is also surrounded by trees which will reduce the effect considerably (in duration and magnitude).



**Table 6-2: Buildings with potential risk of being affected by shadow flicker**

<b>FARM</b>	<b>LABEL</b>	<b>HOURS/YEAR (h:m:s/a)</b>	<b>DAYS/ YEAR</b>	<b>MAX HOURS/DAY (h:m/a)</b>	<b>FEATURE</b>	<b>LONGITUDE</b>	<b>LATITUDE</b>
PEYNES KRAAL (362/0)	E	03:59	25	00:13	HOUSE	26.8532	-33.2769
PEYNES KRAAL (362/0)	G	04:26	26	00:14	HOUSE	26.8532	-33.2765
GILEAD (361/1)	H	09:55	48	00:16	LODGE	26.8092	-33.2764
PEYNES KRAAL (362/0)	I	06:16	45	00:16	HOUSE	26.8523	-33.2762
COOMBS VALE (3/1)	J	00:00	0	00:00	HOUSE	26.8393	-33.2975
PEYNES KRAAL (362/0)	K	07:45	49	00:18	HOUSE	26.8515	-33.2759
COOMBS VALE (3/1)	L	35:24:00	70	00:35	HOUSE	26.8377	-33.2974
SPITZKOP (217/0)	O	00:00	0	00:00	HUT	26.8172	-33.2574
PEYNES KRAAL (362/0)	P	06:54	30	00:19	HOUSE	26.8546	-33.273



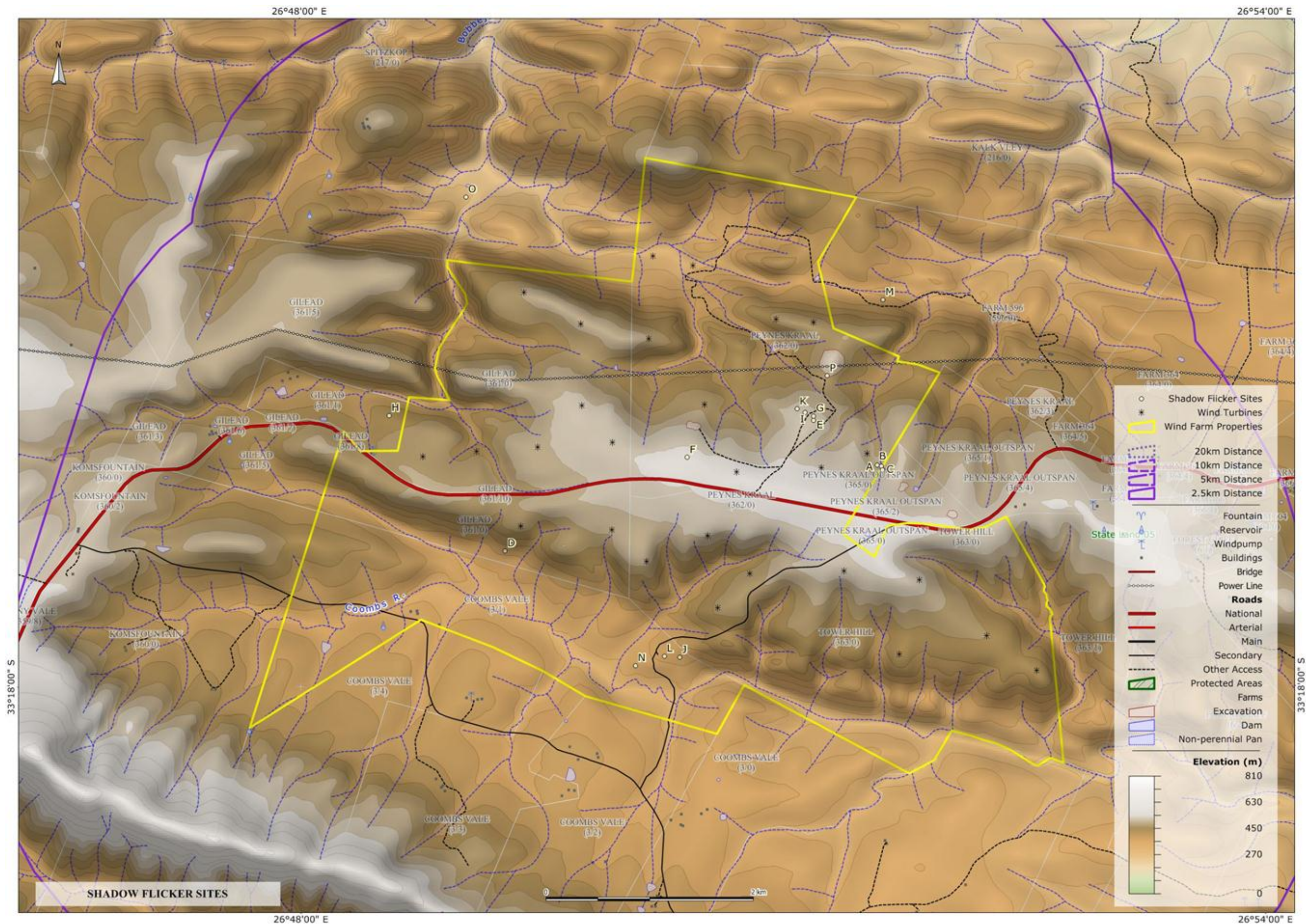


Figure 6-7 Sites that may be affected by shadow flicker from nearby wind turbines.



**6.7 Noise Impact Assessment**

**6.7.1 Predicted Noise Levels for the Construction Phase**

The construction noise at the various project sites will have a local impact. Typical noise emissions of various pieces of construction equipment are presented in the Table 6-3 below.

**Table 6-3: Typical Construction Noise**

Type of Equipment	LReq.T dB(A)
CAT 320D Excavator measured at approximately 50 m.	67.9
Mobile crane measured at approximately 70 m	69.6
Drilling rig measured at approximately 70 m	72.6

The impact of the construction noise that can be expected at the proposed site can be extrapolated from Table 6-2. As an example, if a number of pieces of equipment are used simultaneously, the noise levels can be added logarithmically and then calculated at various distances from the site to determine the distance at which the ambient level will be reached.

**Table 6-4: Combining Different Construction Noise Sources – High Impacts (Worst Case)**

Description	Typical Sound Power Level (dB)
Overhead and mobile cranes	109
Front end loaders	100
Excavators	108
Bull Dozer	111
Piling machine (mobile)	115
Total*	117

\*The total is a logarithmic total and not a sum of the values.

**Table 6-5: Combining Different Construction Noise Sources – Low Impacts**

Description	Typical Sound Power Level (dB)
Front end loaders	100
Excavators	108
Truck	95
<b>Total</b>	<b>111</b>

The information in the tables was used to calculate the attenuation by distance. Noise will also be attenuated by topography and atmospheric conditions such as temperature, humidity, wind speed

and direction etc. but is ignored for this purpose. Therefore, the distance calculated below would be representative of maximum distances to reach ambient noise levels. The ambient day time and night time noise level measurements are presented in tables 6-6 and 6-7 below.

**Table 6-6: Day time ambient noise level results**

Location	Start Time	Duration (minutes)	Wind (m/s) *(At Microphone)	Temperature (° Celsius) *(At Microphone)	L <sub>Req.T</sub> dB(A)	Comments
Peyneskraal Farmhouse	15:45	10	4.9m/s	13.6° c	49.5	Birds & dogs barking; Traffic noise from N2
Jakkelsdraai Farmhouse (Main)	16:50	10	3.8m/s	13.1° c	45.6	Traffic noise from N2

\*Author measurements of wind speed and temperature at microphone height.

**Table 6-7: Night time ambient noise level results taken on the 29th of June and 23rd July.**

Date	Location	Start Time	Duration (minutes)	L <sub>Req.T</sub> dB(A)	Comments
29 <sup>th</sup> June 2012	Honeykop Farmhouse	22:26	10	43.2	<ul style="list-style-type: none"> <li>Distant traffic</li> <li>Persons walking on gravel</li> </ul>
29 <sup>th</sup> June 2012	Peyneskraal Farmhouse	22:56	10	46.2	<ul style="list-style-type: none"> <li>Distant traffic</li> </ul>
29 <sup>th</sup> June 2012	Jakkelsdraai Farmhouse (Main)	23:26	10	47.7	<ul style="list-style-type: none"> <li>Distant traffic</li> <li>Distant dog barking</li> <li>Sheep and other farm animals</li> </ul>
23 <sup>rd</sup> July 2012	Honeykop Farmhouse	22:15	10	37.1	<ul style="list-style-type: none"> <li>Distant traffic</li> <li>Farm animals</li> <li>Diesel engine</li> </ul>
23 <sup>rd</sup> July 2012	Peyneskraal Farmhouse	22:45	10	31.2	<ul style="list-style-type: none"> <li>3 cars in distance</li> </ul>
23 <sup>rd</sup> July 2012	Jakkelsdraai Farmhouse (Main)	23:05	10	41.4	<ul style="list-style-type: none"> <li>3 cars in distance</li> <li>Farm animals making a noise</li> </ul>

The location of the points at which readings were taken, to establish the ambient noise levels, is displayed in the figure on the next page.

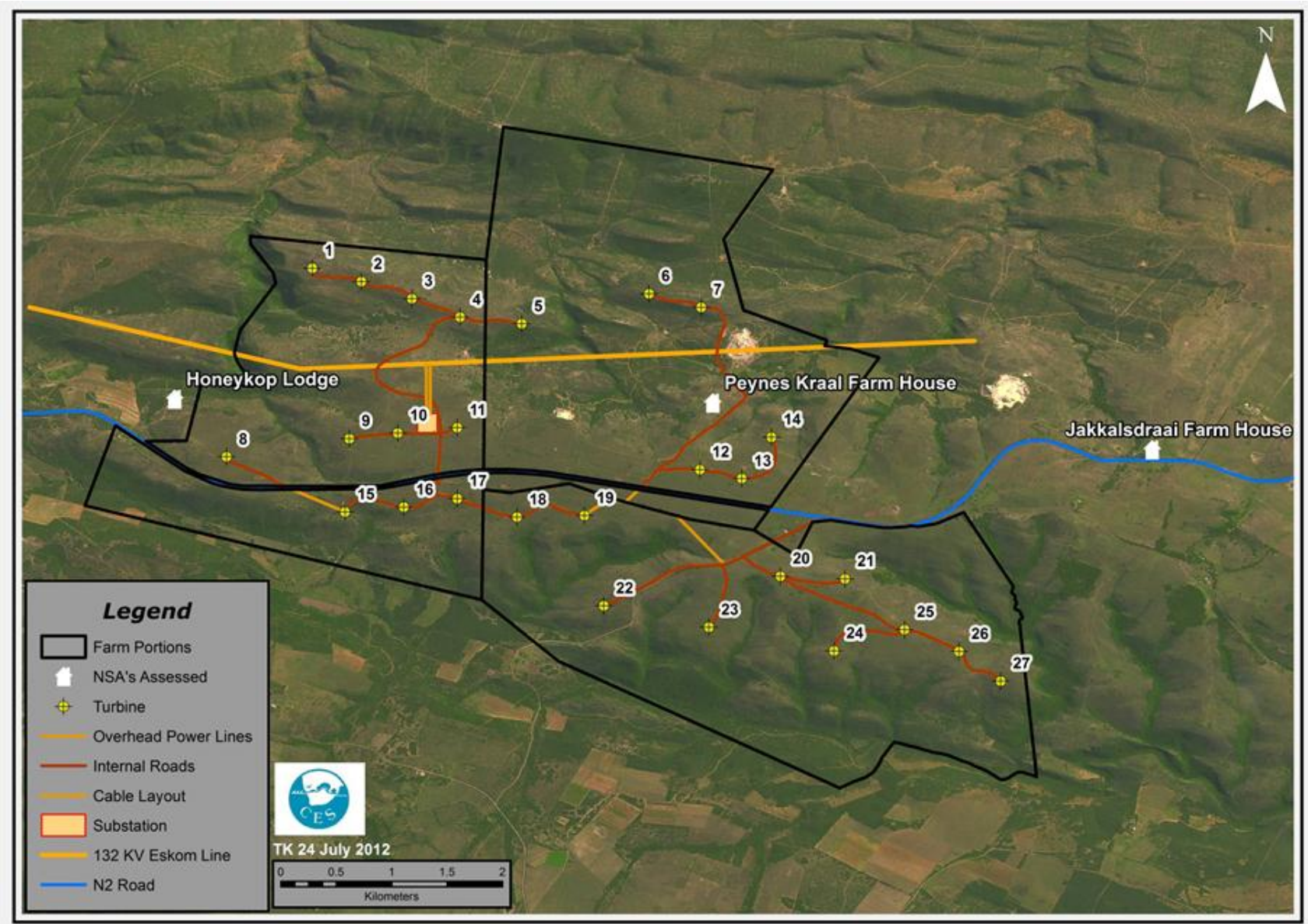


Figure 6-8: The NSA's at which the ambient noise level for the area was measured.

Table 6-8 below gives an illustration of attenuation by distance for a noise of 117dB (sound power) at the source.

**Table 6-8: Attenuation by distance for the construction phase (worst case)**

Distance from noise source (metres)	Sound Pressure Level dB(A)
10	89
20	83
40	77
80	71
160	65
320	59
640	53
1280	47

It can be inferred from the above table that if the ambient noise level is at 45dB, the construction noise will be similar to the ambient level at approximately 1,280m from the noise source, if the noise characteristics are similar. Beyond this distance, the noise level will be below the ambient noise and will therefore have little impact. The above only applies to the construction noise and light wind conditions. In all likelihood the construction noise will have little impact on the surrounding community as it will most likely occur during the day when the ambient noise is louder and there are unstable atmospheric conditions.

**6.7.2 Predicted noise levels for the Operational Phase**

The effects of low frequency noise include sleep disturbance, nausea, vertigo etc. These effects are unlikely to impact on residents due to the distance between the facility and the nearest communities. Sources of low frequency noise also include wind and vehicular traffic, which are all sources that are closer to the residential areas and other Noise Sensitive Areas (NSAs). The impact of the noise pollution that can be expected from the site during the construction and operational phase will largely depend on the climatic conditions at the site. The ambient noise increases as the wind speed increases. In summary the noise rating limits used are 45dB for rural homesteads and 70dB for industrial sites. The recommended setback distances are 500m for the rural homesteads and 100m for the industrial sites.

The results (Tables 6-9 and 6-10) indicate the following for the turbines most likely to be utilised for the project – the Nordex N100 and N90 models respectively:

**Table 6-9: Summary of noise impacts on NSAs at various wind speeds (Nordex N100)**

NSA	4m/s	6m/s	8m/s	10m/s	12m/s	Turbine 500m setback distance criteria met
Jakkeldraai Farm House	✓	✓	✓	✓	✓	Yes



NSA	4m/s	6m/s	8m/s	10m/s	12m/s	Turbine 500m setback distance criteria met
Honeykop Lodge	✓	✓	✓	✓	✓	Yes
Honeykop Farmhouse	✓	✓	✓	✓	✓	Yes
Peynes Kraal Farm House	✓	X	X	X	X	Yes
Workers House - Peynes Kraal	✓	✓	X	X	X	Yes
Workers House - Honeykop	✓	✓	✓	✓	✓	Yes
Workers House - Peynes Kraal	✓	✓	X	X	X	Yes
Fairview Farm House	✓	✓	✓	✓	✓	Yes
Coombs Vale House	✓	✓	✓	✓	✓	Yes
Jakkeldraai Farmhouse (Main)	✓	✓	✓	✓	✓	Yes

✓ = Within Recommended Noise Limit X= Exceeds 45dB (A) day/night Recommended Limit

**Table 6-10: Summary of noise impacts on NSAs at various wind speeds (Nordex N90)**

NSA	4m/s	6m/s	8m/s	10m/s	12m/s	Turbine 500m setback distance criteria met
Jakkeldraai Farm House	✓	✓	✓	✓	✓	Yes
Honeykop Lodge	✓	✓	✓	✓	✓	Yes
Honeykop Farmhouse	✓	✓	✓	✓	✓	Yes
Peynes Kraal Farm House	✓	✓	✓	✓	X	Yes
Workers House - Peynes Kraal	✓	✓	✓	✓	✓	Yes
Workers House - Honeykop	✓	✓	✓	✓	✓	Yes
Workers House - Peynes Kraal	✓	✓	✓	✓	✓	Yes
Fairview Farm House	✓	✓	✓	✓	✓	Yes
Coombs Vale House	✓	✓	✓	✓	✓	Yes
Jakkeldraai Farmhouse (Main)	✓	✓	✓	✓	✓	Yes

✓ = Within Recommended Noise Limit X= Exceeds 45dB (A) day/night Recommended Limit

The results of the study indicate that the following conclusions can be drawn:

- There will be a short term increase in noise in the vicinity of the site during the construction phase as the ambient level will be exceeded. The impact during the construction phase will be difficult to mitigate.
- The impact of low frequency noise and infra sound will be negligible and there is no evidence to suggest that adverse health effects will occur as the sound power levels generated in the low frequency range are not high enough to cause physiological effects.
- The noise produced by the Nordex N100 wind turbines will exceed the 45dB(A) day/night

limit at the main house on Peynes Kraal (6-12m/s wind speed) as well as both workers houses (8-12m/s wind speed).

- The noise produced by the Nordex N90 wind turbines will exceed the 45dB(A) day/night limit at the main house on Peynes Kraal at 12m/s. It is not foreseen that the turbine noise will be heard at 12m/s wind speed due to masking of the ambient noise at this high wind speed.

The following recommendations were made for the construction and operational phases respectively:

**Construction:**

1. WTG 15 and 17 should be moved slightly further from the main house and workers houses at Peyneskraal during the micro-siting phase.
  2. The noise impact should be remodelled when the micro-siting of the turbines take place.
  3. All construction operations should only occur during daylight hours if possible.
- No construction piling should occur at night. Piling should only occur during the day to take advantage of unstable atmospheric conditions.
  - Construction staff should receive “noise sensitivity” training.
  - An ambient noise survey should be conducted during the construction phase.

**Operation:**

- The noise impact from the wind turbine generators should be measured during the operational phase to ensure that the impact is within the recommended rating limits.

**6.8 Agricultural Assessment**

In terms of grazing, the assessment could not determine whether livestock will be able to utilize the areas in between the turbines, as this will be a decision taken between the wind farm developers and the land owners. Subsequently, it may be a possibility that the farming economy may suffer if grazing is excluded due to the operation of the turbines and an application for change of use of agricultural land may have to be sought. It is likely though, that livestock grazing will be allowed to continue unabated. A land use re-zoning application is currently underway.

Construction of access roads to the turbine sites may result in the loss of vegetation, particularly as the existing dirt roads may not be suitable for the transport of heavy machinery and equipment required for construction and maintenance of the turbines, particularly during episodic rainfall events.

Soils found within the proposed development site are generally shallow and have a high erosion index rating. Consequently, areas where clearing of vegetation is required may experience significant erosion. The medium potential soil identified at turbine 6 is localised. If this was moved 50m to the north this soil would be avoided.

Pollution of the water sources e.g. natural drainage zones (watercourses, streams and rivers), earth dams and boreholes may occur as a result of construction activities. Construction activities will lead to increased run-off and this will result in erosion. The soils are generally shallow with a high erosion index rating.

**6.9 Geotechnical Assessment**

The terrain consists of rolling hills with grass land type vegetation. The topsoil is relatively shallow with frequent rocky outcrops and does not have a high agricultural potential. Ground conditions are stable; there are no severe slope stability problems. The land, however, is considered sensitive to soil erosion and care must be taken during construction to mitigate soil erosion.

The hills where the wind turbines are to be situated are mostly of exposed surface or shallow underlying rock of generally fine to medium grained quartzite or sandstone of the Witpoort Formation. The higher hills have localised areas of silcrete. There are no major geological faults in the area. Much of the level area is covered with soils of varying depth. No artefacts were found during the visit to the Site.

In terms of foundation conditions this is a highly favourable site. If possible or practical the bases for the turbines should be excavated through the loose soils and founded on rock. In areas of deep soils mass concrete foundations will be required. Where the rock is on the surface or too shallow to allow for a mass foundation, consideration should be given for the use of rock anchors. This will negate the necessity for expensive mass concrete foundations and the need for blasting. Further research needs to be done to establish the cheaper option, namely blasting and excavating, or the use of rock anchors and a smaller radius foundation with less concrete. Due to the draining nature of the rock, which is highly jointed, the ground water table will be far below any concrete foundation base. This is also due to the position of the wind turbines being on the higher ground in the area.

Ground water may have a high content of dissolved iron but is otherwise considered fairly good quality. Groundwater will not be affected by the construction or ground activity of the wind farm. This is due to the presence of surface rock over part of the area, it can be expected that there will be difficulty with excavating cable trenches in places. The farmer on Tower Hill, however, has successfully excavated irrigation pipes to a depth of 600mm using a ripper attached to a tractor or bull dozer. Alternatively, blasting in localized areas (estimated to about 20% of the total cable length) may be required. Alternatively, consideration should be given to surface conduits or pole mounted cables. The need for cathodic protection may be required for buried cables, due to the relatively high iron content in the rock, especially during rainy periods.

Temporary access roads can be constructed in similar manner to farm roads, with the provision for additional wearing-course gravel where required to make grade. Already, much of the wind turbine sites can be accessed on the existing farm roads although there are several places where the gradient exceeds the allowable 6% gradient and allowable turning radius. These geometric challenges can be overcome by re-design of the road. The borrow pit where material for the Coombs road that passes through the Tower Hill farm has a limited supply of sub base which can be used for access roads. The material was tested at GeoScience Laboratories and found to be of G5 grade, which is acceptable. Other borrow pits are found on the Peynes Kraal farm which was estimated to be of G5 grade or less. Relatively steep access roads may need to be concreted to prevent soil erosion.

In summary, ground conditions are stable; there are no slope stability problems. Care needs to be taken during construction to mitigate soil erosion as the top soil is thin. Geotechnical constraints are minor and relate to the presence of surface or shallow hard rock over the areas where the turbines are to be installed. Ripping or blasting may be required for trenching and foundation excavation.

## IMPACT ASSESSMENT

In terms of section 31 (2) of the EIA regulations (2010), an *environmental impact assessment report must include:*

- (k) *A description of all environmental issues that were identified during the environmental impact assessment process, an assessment of the significance of each issue and an indication of the extent to which the issue could be addressed by the adoption of mitigation measures;*
- (l) *Assessment of each identified potentially significant impact, including –*
  - i. *cumulative impacts;*
  - ii. *the nature of the impact;*
  - iii. *the extent and duration of the impact;*
  - iv. *the probability of the impact occurring;*
  - v. *the degree to which the impact can be reversed;*
  - vi. *the degree to which the impact may cause irreplaceable loss of resources; and*
  - vii. *the degree to which the impact can be mitigated.*
- (m) *A description of any assumptions, uncertainties and gaps in knowledge*

Please note when reviewing these impacts that some of the assumptions, uncertainties and gaps in knowledge have been described in Chapter 1.

### 7.1 Construction Phase Impacts

#### 7.1.1 Flora and Vegetation

##### **Issue 1: Loss of vegetation communities**

Construction of the wind farm will result in loss of a small amount of vegetation on the site. This loss will occur as a result of trampling of the vegetation as well as extra clearing needed for construction. Mitigation measures can be used in order to reduce the trampling and rehabilitate the vegetation respectively. If nothing were built on the site the overall significance would be negative. This would be due to the continuation of the current land use, grazing, which is already having a negative impact on the vegetation of the site.

##### **Impact 1: Loss of Degraded Thicket**

##### **Cause and Comment**

Five turbines occur in this vegetation type, with two bordering very closely on this vegetation type. It is considered a low sensitivity area due to its degraded nature and, as turbine footprints are small; impacts are low. If nothing were built on the site, the overall significance would be negative. This would be due to the continuation of the current land use, grazing, which is already having a negative impact on the vegetation of the site.

##### **Mitigation and management**

Mitigation measures include the following: Keep removal of vegetation to a minimum. Do not remove vegetation in areas set aside for conservation within the site (should an area be set aside for conservation, this is recommended).

**Without mitigation:** In the construction phase of this development, the impact will be permanent, localised, may occur and will be a slight severity. The overall significance of the impact will thus be a low negative. This impact was assessed with a high level of confidence.

**With mitigation:** With mitigation, in the construction phase of the development, the impact is reduced to moderate and probable and has an overall significance of low negative.

**Significance statement**

Impact	Effect			Risk or Likelihood	Total Score
	Temporal Scale	Spatial Scale	Severity of Impact		
<b>Construction phase</b>					
Without mitigation	Permanent	Localised	Slight	May occur	LOW -
With mitigation	Permanent	Localised	Slight	Slight	LOW -
<b>No-Go</b>					
Without mitigation	Long term	Study area	Moderate	Probable	MODERATE -
With mitigation	N/A	N/A	N/A	N/A	N/A

**Impact 2: Loss of Fynbos****Cause and Comment**

Four turbines occur in this vegetation type, with one bordering very closely on this vegetation type. It is considered a medium sensitivity area due to the presence of species of special concern, as turbine footprints are small; impacts are relatively low.

**Mitigation and management**

It is recommended that areas containing species of special concern be noted and every effort made to reduce the impacts of construction on these sections of vegetation. SSC in any area to be cleared should be identified and rescued. Some SSC will not transplant. These individuals should, as far as possible, be left untouched.

**Without mitigation:** In the construction phase of this development, the impact will be permanent, localised, may occur and will be a slight severity. The overall Significance of the impact will thus be a low negative. This impact was assessed with a high level of confidence.

**With mitigation:** With mitigation, in the construction phase of the development, the impact remains an overall significance of low negative.

**Significance statement**

Impact	Effect			Risk or Likelihood	Total Score
	Temporal Scale	Spatial Scale	Severity of Impact		
<b>Construction phase</b>					
Without mitigation	Permanent	Localised	Slight	May occur	LOW -
With mitigation	Permanent	Localised	Slight	Slight	LOW -
<b>No-Go</b>					
Without mitigation	Long term	Study area	Moderate	Probable	MODERATE -
With mitigation	N/A	N/A	N/A	N/A	N/A

**Impact 3: Loss of Fynbos, thicket, karoo mosaic****Cause and Comment**

Sixteen turbines occur in this vegetation type, with two bordering very closely on this vegetation type. It is considered a low sensitivity area due to the level of degradation due primarily to overgrazing, but also, to a lesser extent, to the invasion by alien species. As turbine footprints are small; impacts are relatively low.

**Mitigation and management**

Mitigation measures to reduce the impact of the introduction of alien invaders, as well as mitigation against alien invaders that have already been recorded on the site should be actively maintained

throughout both the construction and operation phases. Removal of existing alien species should be consistently done. Also, rehabilitation of disturbed areas after the construction of the wind energy facility should be done as soon as possible after construction is completed. Invasive plant species are most likely to enter the site carried in the form of seeds by construction vehicles and staff; these should be cleaned before entering the site to prevent alien infestation.

**Without mitigation:** In the construction phase of this development, the impact will be permanent, localised, may occur and will be a slight severity. The overall Significance of the impact will thus be a low negative. This impact was assessed with a high level of confidence.

**With mitigation:** With mitigation, in the construction phase of the development, the impact is remains an overall significance of low negative.

**Significance statement**

Impact	Effect			Risk or Likelihood	Total Score
	Temporal Scale	Spatial Scale	Severity of Impact		
<b>Construction phase</b>					
Without mitigation	Permanent	Localised	Slight	May occur	LOW -
With mitigation	Permanent	Localised	Slight	Slight	LOW -
<b>No-Go</b>					
Without mitigation	Long term	Study area	Moderate	Probable	MODERATE -
With mitigation	N/A	N/A	N/A	N/A	N/A

**Loss of Rocky Fynbos**

No turbines are situated in this vegetation type; this impact is thus not applicable.

**Loss of Thicket**

No turbines are situated in this vegetation type; this impact is thus not applicable.

**Impact 4: Loss of Thicket Mosaic**

One turbine occurs in this vegetation type. It is considered a high sensitivity area due to the numbers of species of special concern occurring here. As turbine footprints are small; impacts are low.

**Without mitigation:** In the construction phase of this development, the impact will be permanent, localised, may occur and will be a slight severity. The overall Significance of the impact will thus be a low negative. This impact was assessed with a high level of confidence.

**With mitigation:** With mitigation, in the construction phase of the development, the impact remains an overall significance of low negative.



**Significance statement**

Impact	Effect			Risk or Likelihood	Total Score
	Temporal Scale	Spatial Scale	Severity of Impact		
<b>Construction phase</b>					
Without mitigation	Permanent	Localised	Slight	May occur	LOW -
With mitigation	Permanent	Localised	Slight	Slight	LOW -
<b>No-Go</b>					
Without mitigation	Long term	Study area	Moderate	Probable	MODERATE -
With mitigation	N/A	N/A	N/A	N/A	N/A

**Issue 2: Loss of species of special concern and biodiversity (general)**

**Impact 5: Loss of plant species of special concern**

**Cause and Comment**

There are, on the study site, thirteen species of special concern. There may be many additional species of special concern that will be found on site during construction that were not found during this study. These should be relocated if they need to be removed, and the required permits obtained in order to do so. Immediately prior to construction, when the final infrastructure layout is available, a botanical search and rescue operation will need to be conducted to transplant these species from the development footprint. If nothing was built on the site the overall impact would be negative. This would be due to the continuation of the current land use, grazing.

**Mitigation and management**

It is recommended that areas containing species of special concern be noted and every effort made to reduce the impacts of construction on these sections of vegetation. SSC in any area to be cleared should be identified and rescued. Some SSC will not transplant. These individuals should, as far as possible, be left untouched.

**Without mitigation:** Without mitigation in the construction phase of the project the impact will be restricted to the study area, long term and definite with a moderate impact, resulting in an overall significance of high negative. This impact was assessed with a high level of confidence.

**With mitigation:** With mitigation the severity of the impact is decreased from moderate to slight and the risk from definite to probable, reducing the overall significance of the impact to low negative.

**Significance statement**

Impact	Effect			Risk or Likelihood	Total Score
	Temporal Scale	Spatial Scale	Severity of Impact		
<b>Construction phase</b>					
Without mitigation	Long term	Study area	Moderate	Definite	HIGH -
With mitigation	Long term	Study area	Slight	Probable	LOW -
<b>No-Go</b>					
Without mitigation	Long term	Study area	Moderate	Probable	MODERATE -
With mitigation	N/A	N/A	N/A	N/A	N/A

**Impact 6: Loss of animal species of special concern**

**Cause and Comment**

There are a number of species of special concern that occur within the study site. This development is unlikely to affect any of these as few are restricted to the site specifically. For the No-Go option, the impact will be negative. This would be due to the continuation of the current land use.

**Mitigation and management**

If any fencing is to be done the fences should have enough space between wires for small animals to move across them uninhibited. Workers should also be educated on conservation and should not be allowed to trap animals on site.

**Without mitigation:** Without mitigation in the construction phase of the development, the impact will be long term, restricted to the study area and may occur with a slight severity and an overall significance of low negative. This impact was assessed with a high level of confidence.

**With mitigation:** Mitigation measures reduce the risk to unlikely, but the overall significance remains a low negative.

**Significance statement**

Impact	Effect			Risk or Likelihood	Total Score
	Temporal Scale	Spatial Scale	Severity of Impact		
<b>Construction phase</b>					
Without mitigation	Long term	Study area	Slight	May occur	LOW -
With mitigation	Long term	Study area	Slight	Unlikely	LOW -
<b>No-Go</b>					
Without mitigation	Long term	Study area	Moderate	Probable	MODERATE -
With mitigation	N/A	N/A	N/A	N/A	N/A

**Impact 7: Loss of biodiversity**

**Cause and Comment**

This will occur as a result of the loss of some of the vegetation on site. Species other than just species of special concern will be affected; both floral and faunal. For the No-Go option, the impact will be negative due to the continuation of the current land use.

**Mitigation and management**

An area within the site that can be set aside for conservation and actively managed as a corridor area would be ideal to mitigate loss of biodiversity. It is recommended that as much as possible of the high sensitivity areas be set aside as conservation areas and be managed as such by the land owners and wind farm developers.

**Without mitigation:** Without mitigation in the construction phase of the development, the impact will be permanent, restricted to the study area and may occur with a moderate severity and an overall significance of moderate negative. This impact was assessed with a high level of confidence.

**With mitigation:** Mitigation measures reduce the risk to unlikely and the severity to slight, reducing the overall significance to negative.

**Significance statement**

Impact	Effect			Risk or Likelihood	Total Score
	Temporal Scale	Spatial Scale	Severity of Impact		
<b>Construction phase</b>					
Without mitigation	Permanent	Study area	Moderate	May occur	<b>MODERATE -</b>
With mitigation	Permanent	Study area	Slight	Unlikely	<b>LOW -</b>
<b>No-Go</b>					
Without mitigation	Long term	Study area	Moderate	Probable	<b>MODERATE -</b>
With mitigation	N/A	N/A	N/A	N/A	<b>N/A</b>

**Issue 3: Disruption of ecosystem function and process**

**Cause and comment**

The habitats that exist in the project area, together with those of the surrounding area that are linked, form part of a functional ecosystem. An ecosystem provides more than simply a ‘home’ for a set of organisms, and can be viewed as an arena where biological and biophysical processes such as nutrient cycling, soil formation, reproduction, migration, competition, predation, succession, evolution and migration take place. Destruction or modification of habitats causes disruption of ecosystem function, and threatens the interplay of processes that ensure environmental health and the survival of individual species. This issue deals with a collection of complex ecological impacts that are almost impossible to predict with certainty, but which are nonetheless important. Fragmentation is one of the most important impacts on vegetation, especially when this creates breaks in previously continuous vegetation, causing a reduction in the gene pool and a decrease in species richness and diversity. In terms of current land use, this impact occurs when large areas are cleared for agriculture or large areas of vegetation are overgrazed.

The removal of existing vegetation creates ‘open’ habitats that will inevitably be colonised by pioneer plant and animal species. While this is part of a natural process of regeneration, which would ultimately lead to the re-establishment of a secondary vegetation cover, it also favours the establishment of undesirable species in the area. These species are introduced along transport lines, by the transportation into the area of goods and equipment, and by human and animal movements in the area. Once established, these species are typically very difficult to eradicate and may then pose a threat to the neighbouring ecosystem. This impact is likely to be exacerbated by careless management of the site and its facilities, e.g. organic waste disposal and inadequate monitoring. Many such species are, however, remarkably tenacious once they have become established.

**Impact 8: Fragmentation of vegetation and edge effects**

**Cause and Comment**

This impact is unlikely to occur if the development is managed effectively. Considering the nature of wind turbines, it is unlikely that fragmentation will occur if the natural vegetation is left beneath them and the building of roads kept to a minimum.

**Mitigation and management**

As mentioned above, fragmentation is unlikely to occur due to the nature of the development. However, it is important to make sure all fences have wide enough mesh to let small animals through, and that large areas of vegetation are not cleared, especially for roads. For the No-Go option, the impact will be negative. This would be due to the continuation of the current land use.

**Without mitigation:** Without mitigation the impact will be unlikely, in the long term and restricted to

the study area and slight. Overall significance will be a low negative.

**With mitigation:** With mitigation the temporal scale would be reduced from long term to short term, thus the overall significance remains a low negative. This impact was assessed with a high level of confidence.

**Significance statement**

Impact	Effect			Risk or Likelihood	Total Score
	Temporal Scale	Spatial Scale	Severity of Impact		
<b>Construction phase</b>					
Without mitigation	Long term	Study area	Slight	Unlikely	LOW -
With mitigation	Short term	Study area	Slight	Unlikely	LOW -
<b>No-Go</b>					
Without mitigation	Long term	Study area	Slight	Unlikely	LOW -
With mitigation	N/A	N/A	N/A	N/A	N/A

**Impact 9: Invasion of alien species**

**Cause and Comment**

As with all building operations, the introduction of alien and invader species is inevitable; with disturbance comes the influx of aliens. Alien invader species need to be consistently managed over the entire operation phase of the project.

**Mitigation and management**

Mitigation measures to reduce the impact of the introduction of alien invaders, as well as mitigation against alien invaders that have already been recorded on the site should be actively maintained throughout both the construction and operation phases. Removal of existing alien species should be consistently done. Also, rehabilitation of disturbed areas after the construction of the wind energy facility should be done as soon as possible after construction is completed. Invasive plant species are most likely to enter the site carried in the form of seeds by construction vehicles and staff; these should be cleaned before entering the site to prevent alien infestation.

**Without mitigation:** In the construction phase of the development, the impact will be short-term, restricted to the study area and definite, with a severe severity. The impact will have an overall significance of moderate negative. In the operation phase of the project, the impact will be permanent, restricted to the study area, definite and with a severe severity. Overall significance would be a high negative. Should the proposed development not go ahead (the No-Go option), the impact would be permanent, definite and restricted to the study area with a severity of moderate and an overall significance of high negative. This impact was assessed with a high level of confidence.

**With mitigation:** In the construction phase of development mitigation measures will result in an overall positive impact. For the operation phase of development; mitigation measures will result in an overall positive impact.

**Significance statement**

Impact	Effect			Risk or Likelihood	Total Score
	Temporal Scale	Spatial Scale	Severity of Impact		
<b>Construction phase</b>					
Without mitigation	Short term	Study area	Severe	Definite	<b>MODERATE -</b>
With mitigation	Short term	Study area	Moderately beneficial	Definite	<b>MODERATE +</b>
<b>No-Go</b>					
Without mitigation	Permanent	Study area	Moderate	Definite	<b>HIGH -</b>
With mitigation	N/A	N/A	N/A	N/A	<b>N/A</b>

**7.1.2 Avifauna****Impact 10: Avifauna Habitat Destruction****Cause and Comment**

During construction a relatively large amount of habitat destruction will take place. This will be from the actual footprint of each turbine (+-20m x 20m) as well as associated infrastructure such as roads, batching plants, labour camps, power lines, substations and machinery and equipment storage. From an avifaunal perspective this habitat destruction will result in a loss of habitat for many bird species. It must be noted however, that the target species that occur in the study area have large territories and therefore the habitat destruction and disturbance was assigned a low significance.

**Mitigation and Management**

The preferred mitigation for this impact would be to select a site that is already disturbed or transformed, for example a mine spoil site or a maize land. With no alternative sites under consideration, and with a project of this scale, the possibility for mitigating the impact of habitat destruction is very low. The scale of the project means that it is inevitable that certain amounts of habitat destruction will take place. The mitigation for this impact will be to only affect the minimum amount of habitat possible and to avoid any natural habitats as far as possible. This means that where possible existing roads must be used and batching plants, labour camps, equipment storage, etc. should be situated in areas that are already disturbed. A full EMPr must also be prepared to specify all of the impacts and mitigation measures to follow for the ECO on site. Specialist avifaunal input must be included into the EMPr and this will focus on breeding sensitive species and their locations and the mitigation for this impact.

**Significance Statement**

Impact	Effect						Risk or Likelihood	Total Score	Overall Significance
	Temporal Scale		Spatial Scale		Severity of Impact				
<b>Construction phase</b>									
Without mitigation	Permanent	4	Localised	1	Slight	1	Definite	4	<b>LOW- TO MODERATE -</b>
With mitigation	Permanent	4	Localised	1	Slight	1	Definite	4	<b>LOW -</b>
<b>No-Go</b>									
Without mitigation	N/A		N/A		N/A		N/A		<b>N/A</b>
With mitigation	N/A		N/A		N/A		N/A		<b>N/A</b>



Habitat destruction is rated as a moderate negative before mitigation. With the no-go alternative, no habitat destruction is anticipated under the current land use (grazing) and hence the impact is not applicable.

**Impact 11: Disturbance of birds**

**Cause and Comment**

During construction, disturbance of avifauna during all of the construction activities has the ability to negatively affect avifauna. This is especially true during breeding of sensitive species. The impact can cause sensitive species to abandon their nest or chicks and as such these species can lose this important recruitment to the population.

**Mitigation and Management**

Mitigation for disturbance is much the same as for habitat destruction. In general terms all construction activities should result in the minimum amount of disturbance possible. This will be detailed in the site specific EMPr and will be enforced and overseen by the ECO for the project. During the EMPr the avifaunal specialist must identify any breeding sensitive bird species in close proximity to specified turbine locations, as well as associated infrastructure positions. Specific recommendations must be provided for each case and these must be strictly enforced and followed.

**Significance Statement**

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale		Severity of Impact						
<b>Construction phase</b>										
Without mitigation	Short term	1	Localised	1	Slight	1	Probable	3	<b>6</b>	<b>LOW -</b>
With mitigation	Short term	1	Localised	1	Slight	1	Probable	3	<b>6</b>	<b>LOW -</b>
<b>No-Go</b>										
Without mitigation	N/A		N/A		N/A		N/A			<b>N/A</b>
With mitigation	N/A		N/A		N/A		N/A			<b>N/A</b>

Disturbance is rated as low negative before mitigation, however mitigation must still be implemented to keep it this way and make sure that sensitive bird species are not affected.

With the no-go alternative, no additional disturbance to avifauna is anticipated under the current land use practises (grazing) and hence the impact is not applicable.

**7.1.3 Bats (Chiroptera)**

**Impact 12: Destruction of bat foraging habitat**

**Cause and Comment**

Bat foraging habitat will possibly be destroyed during the construction phase and this impact will be present to a lesser extent during the lifetime of the wind farm, when turbines are constructed in areas designated as sensitive for bat foraging habitat. Such areas are higher in moisture and will therefore support more insects, which in turn will attract more insectivorous bats. **Important note: These assessments were made on the preliminary turbine layout, and the layout has been revised in response to the specialist assessments. In can thus be said, with regards to this impact specifically, that the mitigation measure suggested has been implemented.**

### Mitigation and Management

Correct turbine placement is crucial to avoid destruction of bat foraging habitat. The areal footprint of the wind farm should be kept to a minimum, and areas designated as sensitive should be avoided.

### Significance Statement

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale	Severity of Impact							
<b>Construction phase</b>										
Without mitigation	Long term	3	Study Area	2	Slight	1	Unlikely	1	8	MODERATE -
With mitigation	Long Term	3	Study Area	2	Slight	1	Unlikely	1	7	LOW -
<b>No-Go</b>										
Without mitigation	Permanent	4	Study Area	2	Beneficial	1	Probable	3	10	N/A
With mitigation	N/A		N/A		N/A		N/A			N/A

### Impact 13: Destruction of bat roosts

#### Cause and Comment

Bat roosting habitat will indefinitely be destroyed during the construction phase and this impact will be present to a lesser extent during the lifetime of the wind farm. When turbines are constructed in areas designated as sensitive for bat roosting habitat, larger trees and riparian/dense valley vegetation will be destroyed. Such areas can provide many roosting spaces under tree bark and any other hollows/crevices. **Important note: These assessments were made on the preliminary turbine layout, and the layout has been revised in response to the specialist assessments. In can thus be said, with regards to this impact specifically, that the mitigation measure suggested has been implemented.**

### Mitigation and Management

Correct turbine placement is empirical to avoid destruction of bat roosting habitat. The areal footprint of the wind farm should be kept to a minimum, and areas designated as sensitive should be avoided.

### Significance Statement

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale	Severity of Impact							
<b>Construction phase</b>										
Without mitigation	Long term	3	Study area	2	Moderate	2	Probable	3	10	MODERATE -
With mitigation	Long Term	3	Study area	2	Slight	1	Unlikely	1	7	LOW -
<b>No-Go</b>										
Without mitigation	Permanent	4	Study Area	2	Beneficial	1	May Occur	2	9	N/A
With mitigation	N/A		N/A		N/A		N/A			N/A

### 7.1.4 Archaeology

#### Impact 14: Impact on heritage resources

##### Cause and Comment

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Archaeological or other heritage materials occurring in the path of any surface or sub-surface disturbances associated with any aspect of the development are highly likely to be subject to destruction, damage, excavation, alteration, or removal. The objective should be to limit such impacts to the primary activities associated with the development and hence to limit secondary impacts during the medium and longer term working life of the facility.

##### Mitigation and Management

Known sites should be located and isolated, e.g. by fencing them off. Those resources that cannot be avoided and that are directly impacted by the development can be excavated/recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the management plan, whence they can be avoided or cared for in the future. In only one case would a turbine and access road be constructed near to a sensitive site, namely the unmarked graves. A buffer zone of 15m around the graves should be enforced and demarcated by a perimeter fence. All workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer:

- Provision for on-going heritage monitoring which provides guidelines on what to do in the event of any major heritage feature being encountered during any phase of development or operation.
- Inclusion of further heritage impact consideration in any future extension of infrastructural elements.
- Immediate reporting to relevant heritage authorities of any heritage feature discovered during any phase of development or operation of the facility.

##### Significance Statement

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale	Severity of Impact							
<b>Construction phase</b>										
Without mitigation	Long term	3	Localised	1	Slight	1	May Occur	2	7	LOW -
With mitigation	Medium term	2	Localised	1	Slight	1	May Occur	2	6	LOW -
<b>No-Go</b>										
Without mitigation	Permanent	4	Localised	1	Beneficial	1	May Occur	2	8	MODERATE +
With mitigation	N/A		N/A		N/A		N/A			N/A

### 7.1.5 Noise

#### Impact 15: Potential Construction Noise Sources (General Equipment and Vehicles)

Noise pollution will be generated during the construction phase as well as the operational phase. The construction phase could generate noise during different activities such as:

- Site preparation and earthworks to gain access using bulldozers, trucks etc.
- Foundation construction using mobile equipment, cranes, concrete mixing and pile driving

- equipment (if needed).
- Heavy vehicle use to deliver construction material and the turbines.

The number and frequency of use of the various types of vehicles has not been determined but an indication of the type and level of noise generated is presented below.

**Table 7-1: Typical types of vehicles and equipment to be used on site (Construction Phase)**

Type	Description	Typical Sound Power Level (dB)
Passenger Vehicle	Passenger vehicle or light delivery vehicle such as bakkies	85
Trucks	10 ton capacity	95
Cranes	Overhead and mobile	109
Mobile Construction Vehicles	Front end loaders	100
Mobile Construction Vehicles	Excavators	108
Mobile Construction Vehicles	Bull Dozer	111
Mobile Construction Vehicles	Dump Truck	107
Mobile Construction Vehicles	Grader	98
Mobile Construction Vehicles	Water Tanker	95
Stationary Construction Equipment	Concrete mixers	110
Compressor	Air compressor	100
Compactor	Vibratory compactor	110
Pile Driver	Piling machine (mobile)	115

**Predicted Noise Levels for the Construction Phase**

The construction noise at the various sites will have a local impact. Safetech has conducted noise tests at various construction sites in South Africa and have recorded the noise emissions of various pieces of construction equipment. The results are presented in the Tables below.

**Table 7-2: Typical Construction Noise**

Type of Equipment	L <sub>Req.T</sub> dB(A)
CAT 320D Excavator measured at approximately 50 m.	67.9
Mobile crane measured at approximately 70 m	69.6
Drilling rig measured at approximately 70 m	72.6

The impact of the construction noise that can be expected at the proposed site can be extrapolated from Tables 7.1 and 7.2. As an example, if a number of pieces of equipment are used simultaneously, the noise levels can be added logarithmically and then calculated at various distances from the site to determine the distance at which the ambient level will be reached.

**Table 7-3: Combining Different Construction Noise Sources – High Impacts (Worst Case)**

Description	Typical Sound Power Level (dB)
Overhead and mobile cranes	109

Description	Typical Sound Power Level (dB)
Front end loaders	100
Excavators	108
Bull Dozer	111
Piling machine (mobile)	115
Total*	117

\*The total is a logarithmic total and not a sum of the values.

**Table 7-4: Combining Different Construction Noise Sources – Low Impacts**

Description	Typical Sound Power Level (dB)
Front end loaders	100
Excavators	108
Truck	95
Total	111

The information in the tables above can now be used to calculate the attenuation by distance. Noise will also be attenuated by topography and atmospheric conditions such as temperature, humidity, wind speed and direction etc. but this is ignored for this purpose. Therefore, the distance calculated below would be representative of maximum distances to reach ambient noise levels. The table below gives an illustration of attenuation by distance from a noise of 117dB measured from the source.

**Table 7-5: Attenuation by distance for the construction phase (worst case)**

Distance from noise source (metres)	Sound Pressure Level dB(A)
10	89
20	83
40	77
80	71
160	65
320	59
640	53
1280	47

What can be inferred from the above table is that if the ambient noise level is at 45dB(A), the construction noise will be similar to the ambient level at approximately 1280m from the noise source, if the noise characteristics are similar. Beyond this distance, the noise level will be below the ambient noise and will therefore have little impact. The above only applies to the construction



noise and light wind conditions. In all likelihood, the construction noise will have little impact on the surrounding community as it will most likely occur during the day when the ambient noise is louder and there are unstable atmospheric conditions. The ambient noise levels recorded on the site are presented in tables 6-6 and 6-7.

**Significance Statement – Construction Activities**

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale	Severity of Impact							
<b>Construction phase</b>										
Without mitigation	Short term	1	Localised	1	Slight	1	May Occur	2	5	LOW -
With mitigation	Short term	1	Localised	1	Slight	1	Unlikely	1	4	LOW -
<b>No-Go</b>										
Without mitigation	Permanent	4	Localised	1	Beneficial	1	May Occur	2	8	MODERATE +
With mitigation	N/A		N/A		N/A		N/A			N/A

**7.1.6 Visual**

**Impact 16: Intrusion on views of sensitive visual receptors of construction phase**

**Cause and Comment**

The height of the features being built and the siting on the flat landscape is likely to expose construction activities against the skyline. Large, abnormal freight vehicles and equipment will be visible. Traffic may be disrupted while large turbine components are moved along public roads. Activity at night is also probable since transport of large turbine components may occur after work hours to minimise disruption of traffic on main roads.

**Mitigation Measures**

The most obvious causes of impact cannot be mitigated for since the turbines are so tall and they are to be installed on the top of ridges. The duration of the impact is relatively short, though, and there are a number of mitigation measures that will curtail the intensity to some extent:

- Dust suppression is important as dust will raise the visibility of the development.
- New road construction should be minimised and existing roads should be used where possible.
- The contractor should maintain good housekeeping on site to avoid litter and minimise waste.
- Clearance of indigenous vegetation should be minimised and rehabilitation of cleared areas should start as soon as possible.
- Erosion risks should be assessed and minimised as erosion scarring can create areas of strong visual contrast with the surrounding vegetation, which can often be seen from long distances since they will be exposed against the hillslopes.
- Laydown areas and stockyards should be located in low visibility areas (e.g. valleys between ridges) and existing vegetation should be used to screen them from views where possible.
- Night lighting of the construction sites should be minimised within requirements of safety and efficiency. See section on lighting for more specific measures.
- Fires and fire hazards need to be managed appropriately especially in winter when fires are a constant threat.
- If practical, notify locals when turbines are being assembled, and invite them to a viewing of the construction process (although the novelty may wear off after a while).



Plate 7-1: Construction of the existing Coega wind turbine

**Significance Statement**

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale		Severity of Impact						
<b>Construction phase</b>										
Without mitigation	Short Term	1	Regional	3	High	4	Definite	4	12	HIGH -
With mitigation	Short Term	1	Regional	3	High	4	Definite	4	12	HIGH -
<b>No-Go</b>										
Without mitigation	N/A		N/A		N/A		N/Ar			N/A
With mitigation	N/A		N/A		N/A		N/A			N/A

The duration of the impact is short – construction of the highly visible components of the wind farm is unlikely to last longer than one year. The extent is regional due to the nature of the development (height of towers and siting on ridges and higher ground) and construction activities will be visible over long distances). The severity of the visual impact will be high since construction activity will often be exposed against the skyline. The likelihood of the impact occurring is definite (since construction of the turbines will be outlined against the skyline for many of the viewers, and is likely to be viewed with some curiosity. The construction engineering feat of lifting and attaching components weighing more than 60 tons a piece in a highly visible area is bound to be spectacular (see for example (filmsfromyes2wind 2010) or (Gipe 1995; Stanton 1996; Vissering 2005)).

**Impact 17: Intrusion of large, highly visible wind turbines on the existing views of sensitive visual receptors**

**Cause and Comment**

A number of highly sensitive visual receptors will potentially be affected by the proposed wind farm. These include residents of, and viewpoints in, game farms and eco-tourism operations in the region. There are not many urban areas within 20-25km of the development site, but a few rural villages north of the Fish River are about 10km away and residents here often have scenic views of the hills on which the turbines will be built.

**Mitigation Measures**

There are no mitigation measures that can reduce the perception of a negative impact significantly unless the site is avoided. But there are a number of measures that can enhance the positive aspects of the impact. It has been shown that uncluttered sites are preferred for wind farms (Gipe, 1995; Stanton, 1996; Vissering, 2005). In view of this the following mitigation measures and suggestions may enhance the positive visual aspects of the development:

- Ensure that there are no wind turbines closer than 500m to a residence or farm building.
- Maintenance of the turbines are important. A spinning rotor is perceived as being useful. If a rotor is stationary when the wind is blowing it is seen as not fulfilling its purpose and a negative impression is created (Gipe, 1995).
- Signs near wind turbines should be avoided unless they serve to inform the public about wind turbines and their function. Advertising billboards should be avoided.
- According to the Aviation Act, 1962, Thirteenth Amendment of the Civil Aviation Regulations, 1997: "Wind turbines shall be painted bright white to provide maximum daytime conspicuousness. The colours grey, blue and darker shades of white should be avoided altogether. If such colours have been used, the wind turbines shall be supplemented with daytime lighting, as required."
- Lighting should be designed to minimise light pollution without compromising safety. Investigate using motion sensitive lights for security lighting. Turbines are to be lit according to Civil Aviation regulations.
- An information kiosk (provided that the kiosk and parking area is located in a low visibility area) and trails along the wind farm can enhance the project by educating the public about the need and benefits of wind power. 'Engaging school groups can also assist the wind farm proponent, as energy education is paramount in developing good public relations over the long term. Instilling the concept of sustainability, and creating awareness of the need for wind farm developments, is an important process that can engage the entire community' (Johnston, 2001).

**Significance Statement**

.Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale		Severity of Impact						
<b>Construction phase</b>										
Without mitigation	Long Term	3	Regional	3	High	4	Definite	4	14	HIGH -
With mitigation	Long Term	3	Regional	3	High	4	Definite	4	14	HIGH -
<b>No-Go</b>										
Without mitigation	N/A		N/A		N/A		N/Ar			N/A
With mitigation	N/A		N/A		N/A		N/A			N/A

The temporal scale for the impact is long term since the life span of a wind turbine can be up to 40 years after which it can be dismantled, or upgraded. Although the duration of the impact can be permanent (more than 40 years) since the lifetime of a wind farm can be extended indefinitely, it is possible to remove the turbines completely in a relatively short time and as such the impact is seen as long term rather than permanent. The spatial scale of the impact is regional since the turbines will be visible from more than 20km away on clear days. There are a number of highly sensitive visual receptors with high visual intrusion ratings the severity of the impact is deemed severe.

**Impact 18: Impact of night lights of a wind farm on existing nightscape**

**Cause and Comment**

Wind farms are required by law to be lit at night as they represent hazards to aircraft due to the height of the turbines. Marking of turbines depends on wind farm layout and not all turbines need to be lit. Marking consists of a red flashing light of medium intensity (2000 candela). The conceptual layout of the wind farm is a ‘cluster’ in terms of the lighting specification (Minister of Transport, 1997). It seems then that according to the Civil Aviation directive most of the turbines will have to be marked.

**Mitigation Measures**

The aviation standards have to be followed and no mitigation measures are applicable in terms of marking the turbines. Lighting of ancillary buildings and structures should be designed to minimise light pollution without compromising safety. Motion sensitive lighting can be used for security purposes.

**Significance Statement**

Impact	Effect				Risk or Likelihood	Total Score	Overall Significance			
	Temporal Scale	Spatial Scale	Severity of Impact							
<b>Construction phase</b>										
Without mitigation	Long Term	3	Localised	1	Moderate to Slight	2 to 1	Unlikely or probable	1 or 3	<b>7 or 10</b>	<b>LOW TO MODERATE</b>
With mitigation	Long Term	3	Localised	1	Moderate to Slight	2 to 1	Unlikely or probable	1 or 3	<b>7 or 10</b>	<b>LOW TO MODERATE</b>
<b>No-Go</b>										
Without mitigation	N/A		N/A		N/A		N/Ar			<b>N/A</b>
With mitigation	N/A		N/A		N/A		N/A			<b>N/A</b>

The sources of light pollution in the region are mostly related to farmsteads, communication towers and the background glow caused by towns such as Grahamstown, Peddie and the rural villages spread out along the opposite bank of the Fish River. Vehicles on the N2 also contribute to night lighting.

**7.1.7 Agriculture**

**Impact19: Loss of vegetation**

**Cause and Comment**

The erection and maintenance of the turbines will most certainly require the construction of access roads. Farm type access roads probably exist but these will not be suitable for this type of construction and routine maintenance which may have to take place during and after rains. The

construction of access roads linking the turbine sites will result in the loss of vegetation.

### Mitigation and Management

The conservation status of the three vegetation biomes is least threatened. There may however be listed vegetation species in these vegetation biomes and such plants should be identified and protection measures included in the construction regime. Permits may be required for the removal and transplanting of such species, if this becomes necessary. It is recommended that the positioning of the turbines be discussed with staff of the Department of Agriculture to align the project with the Conservation of Agricultural Resources Act.

### Significance Statement

Impact	Effect						Risk or Likelihood	Total Score	Overall Significance	
	Temporal Scale	Spatial Scale		Severity of Impact						
<b>Construction phase</b>										
Without mitigation	Permanent	4	Study area	2	Very severe	8	Definite	4	18	VERY HIGH -
With mitigation	Permanent	4	Study area	2	Severe	4	Definite	4	14	HIGH -
<b>No-Go</b>										
Without mitigation	Permanent	4	Study Area	2	Beneficial	1	Probable	3	10	MODERATE +
With mitigation	N/A		N/A		N/A		N/A			N/A

### Impact 20: Pollution of water sources

#### Cause and Comment

Pollution of the water sources e.g. natural drainage zones (watercourses, streams and rivers), earth dams and boreholes may occur as a result of construction activities. Construction activities will lead to increased run-off and this will result in erosion. The soils are generally shallow with a high erosion index rating.

#### Mitigation and Management

It is recommended that the positioning of the turbines be discussed with staff of the Department of Agriculture to align the project with the Conservation of Agricultural Resources Act. Construction activities adjacent to watercourses should not be closer than 100 m from the 1-in-100 year flood levels. Should construction take place in close proximity to any drainage area silt fences should be erected to prevent sedimentation. Turbines should be sited at least 100 m away from earth dams and boreholes. Access roads must be provided with adequate drainage structures to control run-off water. A routine maintenance regime is to be implemented as part of the operational plan for the lifespan of the project.



**Significance Statement**

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale	Severity of Impact							
<b>Construction phase</b>										
Without mitigation	Permanent	4	Study area	2	Severe	4	Definite	4	14	<b>HIGH -</b>
With mitigation	Medium term	2	Study area	2	Moderate	2	May occur	2	8	<b>MODERATE -</b>
<b>No-Go</b>										
Without mitigation	Permanent	4	Study Area	2	Beneficial	1	Probable	3	10	<b>MODERATE +</b>
With mitigation	N/A		N/A		N/A		N/A			<b>N/A</b>

**Impact 21: Erosion and construction on land with a gradient**

**Cause and Comment**

Degradation of the vegetative cover will increase potential for erosion to occur as the soils generally have a high erosion index rating.

**Mitigation and Management**

It is recommended that the positioning of the turbines be discussed with staff of the Department of Agriculture to align the project with the Conservation of Agricultural Resources Act. A construction regime to be specified by the design engineer to limit and control loss of vegetation and resultant increased run-off of storm water. A routine maintenance regime is to be implemented as part of the operational plan for the lifespan of the project. The clearance of vegetation should be kept to a minimum to reduce the area of soil exposed at any one time.

**Significance Statement**

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale	Severity of Impact							
<b>Construction phase</b>										
Without mitigation	Permanent	4	Study area	2	Very severe	8	Definite	4	18	<b>VERY HIGH -</b>
With mitigation	Medium term	2	Study area	2	Moderate	2	May occur	2	8	<b>MODERATE -</b>
<b>No-Go</b>										
Without mitigation	Permanent	4	Study Area	2	Beneficial	1	Probable	3	10	<b>MODERATE +</b>
With mitigation	N/A		N/A		N/A		N/A			<b>N/A</b>

The No-Go scenario will result in the current land use remaining the status quo on the ±2 550 ha i.e. cultivation of arable land in the low-lying areas in the Coombs River valley and utilisation of the natural grazing by livestock and game animals. There will therefore be no new impact in terms of current agricultural production and the “farming economy” of the area. The impact of the operation of the turbines on livestock or game is unknown to the author and it may well be feasible to operate the wind turbine farm and continue with farming operations. Thus, to retain the status quo will provide an income to the land users from farming operations only, whereas should farming practices be able to continue together with the implementation of the wind farm this will allow for a potential increase in income from the resources beneficial to the developer, the local community and the country.

## 7.2 Operational Phase Impacts

### 7.2.1 Flora and Vegetation

#### Issue 1: Alien Vegetation

##### Impact 1: Introduction of alien plant species

##### Cause and Comment

As with all building operations, the introduction of alien and invader species is inevitable; with disturbance comes the influx of aliens. Alien invader species need to be consistently managed over the entire operation phase of the project.

##### Mitigation and management

Mitigation measures to reduce the impact of the introduction of alien invaders, as well as mitigation against alien invaders that have already been recorded on the site should be actively maintained throughout the operation phase. Removal of existing alien species should be consistently done.

**Without mitigation:** In the operation phase of the project, the impact will be permanent, restricted to the study area, definite and with a severe severity. Overall significance would be a high negative. Should the proposed development not go ahead (the No-Go option), the impact would be permanent, definite and restricted to the study area with a severity of moderate and an overall significance of high negative. This impact was assessed with a high level of confidence.

**With mitigation:** For the operation phase of development; temporal scale is reduced to medium-term, severity of impact to slightly beneficial and likelihood to may occur, thus reducing the overall significance from high negative to low positive. Alien invasion is just as likely to occur if no development takes place and mitigation measures for the No-Go option will reduce temporal scale, severity and likelihood as well, giving an overall significance of low positive. To ensure the impact is positive, continual alien vegetation clearing should be done during the operation phase.

##### Significance statement

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale	Severity of Impact							
<b>Operation phase</b>										
Without mitigation	Permanent	4	Study area	2	Severe	4	Definite	4	14	HIGH -
With mitigation	Medium-term	2	Study area	2	Slight	1	May Occur	2	7	LOW +
<b>No-Go</b>										
Without mitigation	Permanent	4	Study area	2	Moderate	2	Definite	4	12	HIGH -
With mitigation	Medium-term	2	Study area	2	Slight	1	May Occur	2	7	LOW +

### 7.2.2 Avifauna

#### Impact 2: Bird collision & electrocution on overhead power lines, Impact on Red Listed and other species

##### Cause and Comment:

Collisions are one of the biggest single threats posed by overhead power lines to birds in southern Africa (van Rooyen 2004a). Most heavily impacted are bustards, storks, cranes and various species of water birds. These species are mostly heavy-bodied birds with limited manoeuvrability,

which makes it difficult for them to take the necessary evasive action to avoid colliding with power lines.

Depending on the routes and amount of overhead power lines in this project, this could have a serious impact on avifauna, as several of these key species are common in the study area. At the time of the site visit, an existing 132kV overhead power line traverses the site and a second line was under construction.

Electrocution of the larger bird species whilst perched or roosting on power lines is also a significant impact in South Africa. It is understood that the developer intends to bury all power line underground, so these cumulative impacts may not occur. If there are any changes to these plans, the Avifaunal Specialist should be notified so that these impacts can be reassessed.

**Mitigation:**

Bury all 'on site' power line underground. On power lines to grid, mark certain sections of the line with anti-collision marking devices on the earth wire to increase the visibility of the line and reduce likelihood of collisions. High risk sections of line can only be identified once the route of the power lines is available. Bird friendly pole/pylon designs should be used to prevent electrocutions.

**Significance Statement:**

Impact	Effect				Risk or Likelihood	Total Score	Overall Significance
	Temporal Scale	Spatial Scale	Severity of Impact				
<b>Operation phase</b>							
Without mitigation	Permanent	National	Mod Severe		Probable		<b>MODERATE -</b>
With mitigation							<b>LOW -</b>
<b>No-Go</b>							
Without mitigation	N/A	N/A	N/A		N/A		N/A
With mitigation	N/A	N/A	N/A		N/A		N/A

**Impact 3: Bird disturbance and displacement from area as result of wind turbines and other infrastructure**

**Cause and Comment:**

During operation the disturbance caused by the noise and movement of the wind turbines will disturb avifauna.

**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. Pre-construction monitoring will establish baseline data against which this impact can be evaluated.

**Significance Statement:**

Impact	Effect				Risk or Likelihood	Total Score	Overall Significance
	Temporal Scale	Spatial Scale	Severity of Impact				
<b>Operation phase</b>							
Without mitigation	Permanent	National	Mod Severe		Possible		<b>LOW -</b>
With mitigation							<b>LOW -</b>

No-Go									
Without mitigation	N/A		N/A		N/A		N/A		N/A
With mitigation	N/A		N/A		N/A		N/A		N/A

**Impact 4: Bird collision with turbine blades**

**Cause and Comment:**

In general, the main cause will be the positioning of the turbines in or close to important bird flight paths. This impact of collisions is seen as the largest potential impact on avifauna for this project and as such the one that requires the most mitigation.

**Mitigation:**

This is extremely difficult to mitigate for post construction. Sensitivity mapping and pre-construction monitoring should inform the final turbine layout in order to proactively mitigate for this. If key species are found to collide in significant numbers post construction then mitigation options such as painting turbine blades, blade height adjustment and curtailment will need to be implemented.

**Significance Statement:**

Impact	Effect				Risk or Likelihood	Total Score	Overall Significance
	Temporal Scale	Spatial Scale	Severity of Impact				
<b>Operation phase</b>							
Without mitigation	Permanent	National	Mod Severe		Possible		MODERATE -
With mitigation							MODERATE -
<b>No-Go</b>							
Without mitigation	N/A	N/A	N/A		N/A		N/A
With mitigation	N/A	N/A	N/A		N/A		N/A

**7.2.3 Bats (Chiroptera)**

**Impact 5: Bat mortalities during foraging by turbine blades**

**Cause and Comment**

Since bats have highly sophisticated navigation by means of their echolocation, it is puzzling as to why they would get hit by rotating turbine blades. It may be theorized that under natural circumstances their echolocation is designed to track down and pursue smaller insect prey or avoid stationary objects, not primarily focused on unnatural objects moving sideways across the flight path. Apart from physical collisions, a major cause of bat mortality at wind turbines is barotrauma. This is a condition where the lungs of a bat collapse in the low air pressure around the moving blades, causing severe and fatal internal haemorrhage. One study done by Baerwald, *et al.* (2008a) showed that 90% of bat fatalities around wind turbines involved internal haemorrhaging consistent with barotrauma. Some studies propose that bats may be attracted to the large turbine structure as roosting space, or that swarms of insects get trapped in low air pockets around the turbine and subsequently attract bats. Whatever the reason for bat mortalities around wind turbines, the facts indicate this to be a very serious and concerning problem. During a study by Arnett, *et al.* (2009), 10 turbines monitored over a period of 3 months showed 124 bat fatalities in South-central Pennsylvania (America), which can cumulatively have a catastrophic long term effect on bat populations, if such a rate is persistent. Most bat species only reproduce once a year, bearing one young per female, meaning their numbers are slow to recover.

## Mitigation and Management

The **correct placement** of wind farms and of individual turbines can significantly lessen the impacts on bat fauna in an area. The localities of turbines within the areas marked as sensitive should be critically revised. Sensitive areas include drainage valleys, with densely vegetated slopes, where bat activity is very likely to be higher. During the operational phase **curtailment** can be implemented as a mitigation measure to lessen bat mortalities. Curtailment is when a turbine is kept stationary at a lower wind speed and then allowed to rotate once the wind exceeds a specific speed. The theory behind curtailment is that there is a negative correlation between bat activity and wind speed, causing bat activity to decrease as the wind speed increases.

A test done by Baerwald *et al.* (2008b) where they altered the wind speed trigger of 15 turbines at a site with high bat fatalities in south-western Alberta, Canada, during the peak fatality period, showed a reduction of bat fatalities by 60%. Under normal circumstances the turbine would turn slowly in low wind speeds but only starts generating electricity when the wind speed reaches 4 m/s. During the experiment the Vestas V80 type turbines were kept stationary during low wind speeds and only allowed to start turning and generate electricity at a cut-in speed of 5.5 m/s. Another strategy used in the same experiment involved altering blade angles to reduce rotor speed, meaning the blades were near motionless in low wind speeds which resulted in a significant 57.5% reduction in bat fatalities.

Long term field experiments and studies done by Arnett *et al.* (2010) in Somerset County, Pennsylvania, showed a 44 – 93% reduction in bat fatalities with marginal annual power generation loss, when curtailment was implemented. However, when using a cut-in speed of 6.5 m/s the annual power loss was 3 times higher than when using a 5.0 m/s cut-in speed. Their study concluded that curtailment can be used as an effective mitigation measure to reduce bat fatalities at wind energy facilities. It is **strongly recommended** that the curtailment mitigation measure be implemented at all turbines on the site (prioritizing the ones in areas of Moderate Bat Sensitivity), combined with bat mortality monitoring during the operational phase to quantify the effects of this mitigation and subsequently make adjustments as needed. Although the optimum cut-in speed to reduce bat fatalities and keep power loss at a minimum needs to be researched and determined in the local context, a cut-in wind speed of 5.0 m/s to 5.5 m/s (meters per second) is preliminarily recommended. During the long term pre-construction monitoring, general bat activities and activity patterns of different species can be compared to meteorological data gathered to determine the most effective cut-in speed/weather conditions that may result in low numbers of bat mortalities and marginal power generation loss.

An ultrasonic deterrent device is a device emitting ultrasonic sound in a broad range that is not audible to humans. The concept behind such devices is to repel bats from wind turbines by creating a disorientating or irritating airspace around the turbine. Research in the field of ultrasonic deterrent devices is progressing and yielding some promising results, although controversy about the effectiveness and a lack of large scale experimental evidence exists. Nevertheless, a study done by Szewczak & Arnett (2008), who compared bat activity using an acoustic deterrent with bat activity without the deterrent, showed that when ultrasound was broadcasted only 2.5-10.4% of the control activity rate was observed. A lab test done by Spanjer (2006) yielded promising results, and a field test of such devices done by Horn *et al.* (2008) indicated that many factors are influencing the effectiveness of the device although it did deter bats significantly from turbines. It may be feasible to install such devices on selected functional turbines, and the results being monitored by an appropriately qualified researcher. If collaboration with local academic and research institutions is established to monitor and improve such devices/methods during the functional stage of the wind farm, it can lessen the impacts of the wind farm on bat populations.

It is the opinion of the EAP that the mitigation measures should be applied in a phased approach. Initially, the 12 month pre-construction monitoring programme will guide the final turbine positions. This should be followed by a post-construction monitoring programme of at least 12 to 24 months



coupled with the deployment of acoustic deterrents. If the monitoring programme then identifies that bat mortalities reach unacceptable levels at any point, curtailment should then be implemented. As curtailment reduces the output potential of the turbines, this approach would eliminate any premature measures being implemented that may unnecessarily affect the financial viability of the project.

**Significance Statement**

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale	Severity of Impact							
<b>Operation phase</b>										
Without mitigation	Long Term	3	Study Area	2	Moderate	2	Probable	3	12	HIGH -
With mitigation	Long Term	3	Study Area	2	Slight	1	May occur	2	9	MODERATE -
<b>No-Go</b>										
Without mitigation	N/A		N/A		N/A		N/A	2	10	N/A
With mitigation	N/A		N/A		N/A		N/A			N/A

**Impact 6: Bat mortalities during migration by turbine blades, a cumulative impact**

**Cause and Comment**

The migration paths of South African bats are virtually unknown. Cave dwelling species like *Miniopterus natalensis* and *Myotis tricolor* undertake annual migrations, and since these species were recorded in the project area there is a high probability of a cave being present in the area. The existence of this cave was confirmed by the heritage study. The project area is not in any direct line of a known migration route, but literature data on exact South African bat migration routes are insufficient to accurately assess this impact at this stage of the study. With the increased amount of wind farms proposed to be concentrated in certain parts of the country, the cumulative impacts on cave dwelling bat migration over long distances (up to 260 km according to Van der Merwe, 1973) can be detrimental if no mitigation or precautions are taken

**Mitigation and Management**

Long-term pre-construction monitoring studies can provide some insight on migration paths of these species, and provide valuable information on their seasonal variations in migration activities. Turbine localities should be revised after the analysis of the long term monitoring data if any turbines are located in suspected migration paths. If the project area falls within the path of a migration route, aggressive seasonal mitigations would be essential.

**Significance Statement**

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale	Severity of Impact							
<b>Operation phase</b>										
Without mitigation	Long Term	3	National	3	Severe	4	May Occur	2	12	HIGH -
With mitigation	Long Term	3	National	3	Slight	1	Unlikely	1	8	MODERATE -
<b>No-Go</b>										
Without mitigation	N/A		N/A		N/A		N/A			N/A
With mitigation	N/A		N/A		N/A		N/A			N/A

**7.2.4 Archaeology**

**Impact 7: Impact on Heritage Resources**

**Cause and Comment**

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Archaeological or other heritage materials occurring in the path of any surface or sub-surface disturbances associated with any aspect of the development are highly likely to be subject to destruction, damage, excavation, alteration, or removal. The objective should be to limit such impacts to the primary activities associated with the development and hence to limit secondary impacts during the medium and longer term working life of the facility. Those resources that cannot be avoided and that are directly impacted by the development can be excavated/recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the management plan, from where they can be avoided or cared for in the future.

**Mitigation and Management**

- Protection of archaeological, historical and any other site or land considered being of cultural value within the project boundary against vandalism, destruction and theft.
- The preservation and appropriate management of new discoveries in accordance with the NHRA, should these be discovered during construction.
- Known sites should be located and isolated, e.g. by fencing them off. All workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer.
- Provision for on-going heritage monitoring which provides guidelines on what to do in the event of any major heritage feature being encountered during any phase of development or operation.
- Inclusion of further heritage impact consideration in any future extension of infrastructural elements.
- Immediate reporting to relevant heritage authorities of any heritage feature discovered during any phase of development or operation of the facility.

**Significance Statement**

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance	
	Temporal Scale	Spatial Scale		Severity of Impact					
<b>Operation phase</b>									
Without mitigation	Permanent	4	Localised	1	Slight	2	May Occur	9	MODERATE -
With mitigation	Permanent	4	Localised	1	Slight	1	Unlikely	7	LOW -
<b>No-Go</b>									
Without mitigation	Permanent	4	Localised	1	Beneficial	1	May Occur	8	MODERATE +
With mitigation	N/A		N/A		N/A		N/A		N/A

**7.2.5 Noise**

**Impact 8: Predicted noise levels for the Wind Turbines Generators**

The tables and figures below indicate the isopleths for the noise generated by the turbines at wind speeds from 3m/s to 12m/s. The areas shaded red in the tables indicate where the day / night 45dB(A) recommended limit is exceeded. The results of ambient noise level measurements are presented in table 6-6 and 6-7.

**Table 7-6: Predicted noise levels at the NSA's during the operational phase**

<b>NSA 1 - Jakkeldraai Farm House</b>				
Distance to Nearest WTG[m] - <b>min 500m</b>			Nearest WTG 1826m from WTG 27	
Wind Speed [m/s]	Maximum Noise Allowed [dB(A)]	Nordex N100 2500 HS 2.5MW	Nordex N90 2500 HS 2.5MW	Noise Demand Fulfilled?
4	45	24.0	21.5	Yes
6	45	30.0	22.5	Yes
8	45	31.0	24.5	Yes
10	45	31.0	28.5	Yes
12	45	31.0	29.5	Yes

<b>NSA 2 - Honeykop Lodge</b>				
Distance to Nearest WTG[m] - <b>min 500m</b>			Nearest WTG 532m from WTG 4	
Wind Speed [m/s]	Maximum Noise Allowed [dB(A)]	Nordex N100 2500 HS 2.5MW	Nordex N90 2500 HS 2.5MW	Noise Demand Fulfilled?
4	45	36.1	33.6	Yes
6	45	42.1	34.6	Yes
8	45	43.1	36.6	Yes
10	45	43.1	40.6	Yes
12	45	43.1	41.6	Yes

<b>NSA 3 - Honeykop Farmhouse</b>				
Distance to Nearest WTG[m] - <b>min 500m</b>			Nearest WTG 1520m from WTG 4	
Wind Speed [m/s]	Maximum Noise Allowed [dB(A)]	Nordex N100 2500 HS 2.5MW	Nordex N90 2500 HS 2.5MW	Noise Demand Fulfilled?
4	45	26.8	24.3	Yes
6	45	32.8	25.3	Yes
8	45	33.8	27.3	Yes
10	45	33.8	31.3	Yes
12	45	33.8	32.3	Yes

<b>NSA 4 - Peynes Kraal Farm House</b>				
Distance to Nearest WTG[m] - <b>min 500m</b>			Nearest WTG 503m from WTG 17	
Wind Speed [m/s]	Maximum Noise Allowed [dB(A)]	Nordex N100 2500 HS 2.5MW	Nordex N90 2500 HS 2.5MW	Noise Demand Fulfilled?
4	45	39.6	37.1	Yes

**Volume 3: Environmental Impact Report**

6	45	45.6	38.1	No
8	45	46.6	40.1	No
10	45	46.6	44.1	No
12	45	46.6	45.1	No

**NSA 5 - Workers House - Peynes Kraal**

Distance to Nearest WTG[m] - <b>min 500m</b>		Nearest WTG 591m from WTG 15		
Wind Speed [m/s]	Maximum Noise Allowed [dB(A)]	Nordex N100 2500 HS 2.5MW	Nordex N90 2500 HS 2.5MW	Noise Demand Fulfilled?
4	45	38.2	35.7	Yes
6	45	44.2	36.7	Yes
8	45	45.2	38.7	No
10	45	45.2	42.7	No
12	45	45.2	43.7	No

**NSA 6 - Workers House - Honeykop**

Distance to Nearest WTG[m] - <b>min 500m</b>		Nearest WTG 1394m from WTG 4		
Wind Speed [m/s]	Maximum Noise Allowed [dB(A)]	Nordex N100 2500 HS 2.5MW	Nordex N90 2500 HS 2.5MW	Noise Demand Fulfilled?
4	45	27.2	24.7	Yes
6	45	33.2	25.7	Yes
8	45	34.2	27.7	Yes
10	45	34.2	31.7	Yes
12	45	34.2	32.7	Yes

**NSA 7 - Workers House - Peynes Kraal**

Distance to Nearest WTG[m] - <b>min 500m</b>		Nearest WTG 550m from WTG 17		
Wind Speed [m/s]	Maximum Noise Allowed [dB(A)]	Nordex N100 2500 HS 2.5MW	Nordex N90 2500 HS 2.5MW	Noise Demand Fulfilled?
4	45	38.7	36.2	Yes
6	45	44.7	37.2	Yes
8	45	45.7	39.2	No
10	45	45.7	43.2	No
12	45	45.7	44.2	No

**NSA 8 - Fairview Farm House**

Distance to Nearest WTG[m] - <b>min 500m</b>		Nearest WTG 742m from WTG 24		
--	--	---------------------------------	--	--

Wind Speed [m/s]	Maximum Noise Allowed [dB(A)]	Nordex N100 2500 HS 2.5MW	Nordex N90 2500 HS 2.5MW	Noise Demand Fulfilled?
4	45	35.4	32.9	Yes
6	45	41.4	33.9	Yes
8	45	42.4	35.9	Yes
10	45	42.4	39.9	Yes
12	45	42.4	40.9	Yes

**NSA 9 - Coombs Vale House**

Distance to Nearest WTG[m] - <b>min 500m</b>		Nearest WTG 1340m from WTG 8		
Wind Speed [m/s]	Maximum Noise Allowed [dB(A)]	Nordex N100 2500 HS 2.5MW	Nordex N90 2500 HS 2.5MW	Noise Demand Fulfilled?
4	45	29.9	27.4	Yes
6	45	35.9	28.4	Yes
8	45	36.9	30.4	Yes
10	45	36.9	34.4	Yes
12	45	36.9	35.4	Yes

**NSA 10 - Jakkeldraai Farmhouse (Main)**

Distance to Nearest WTG[m] - <b>min 500m</b>		Nearest WTG 2222m from WTG 26		
Wind Speed [m/s]	Maximum Noise Allowed [dB(A)]	Nordex N100 2500 HS 2.5MW	Nordex N90 2500 HS 2.5MW	Noise Demand Fulfilled?
4	45	24.5	22.0	Yes
6	45	30.5	23.0	Yes
8	45	31.5	25.0	Yes
10	45	31.5	29.0	Yes
12	45	31.5	30.0	Yes



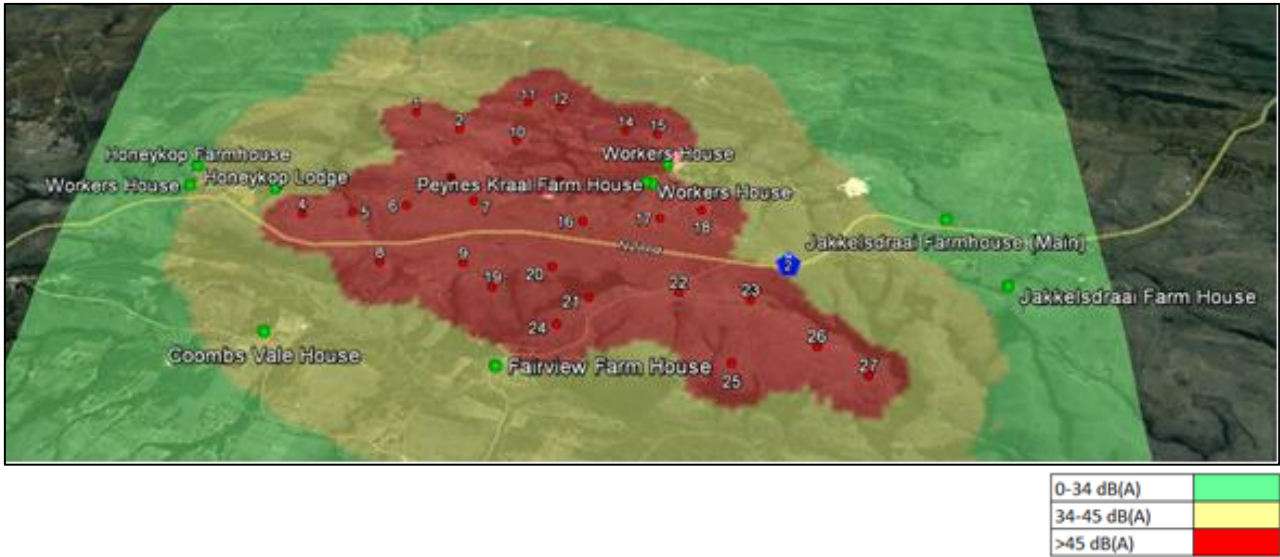


Plate 7-2 – Nordex N100 2.5MW Result 12m.s-1 wind speed

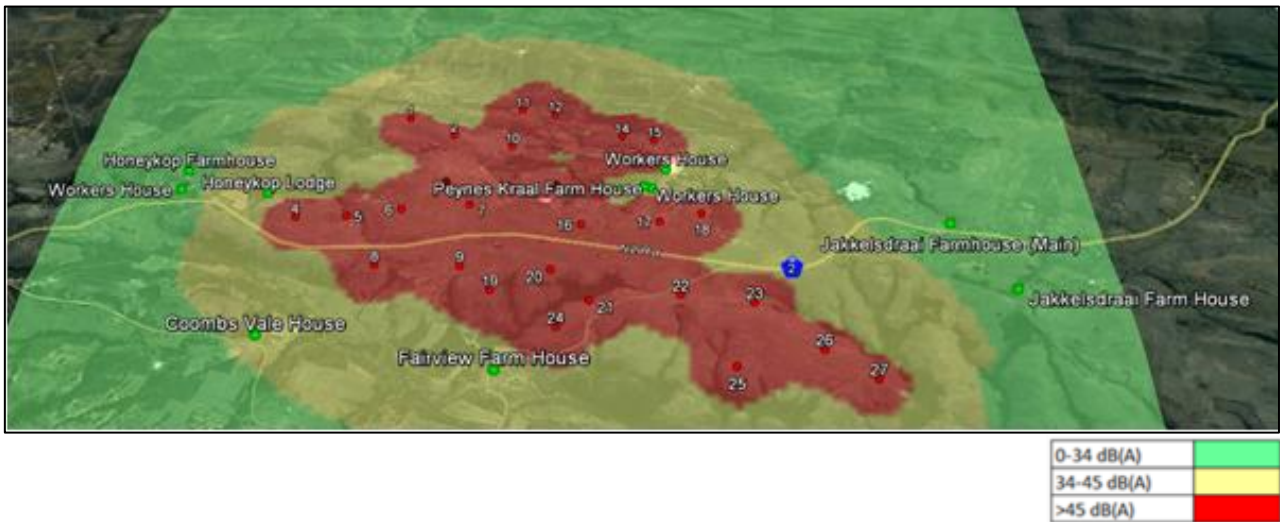


Plate 7-3 – Nordex N90 2.5MW result 12m.s<sup>-1</sup> wind speed

**Significance Statement**

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale	Severity of Impact							
<b>Operation phase</b>										
Without mitigation	Permanent	4	Localised	1	Slight	2	May Occur	2	9	LOW -
With mitigation	Permanent	4	Localised	1	Slight	1	Unlikely	1	7	LOW -
<b>No-Go</b>										
Without mitigation	Permanent	4	Localised	1	Beneficial	1	May Occur	2	8	MODERATE +
With mitigation	N/A		N/A		N/A		N/A			N/A

**7.2.6 Visual**

**Impact 9: Potential landscape impact**

**Cause and Comment**

The landscape is not pristine and is not valued for its scenic views, largely because of the ubiquity

of high voltage power lines; disturbed vegetation and cultivated land.

### Mitigation Measures

There are no mitigation measures that will change the significance of the landscape impact other than avoiding the site entirely. A reduction in wind turbine numbers are unlikely to have an appreciable effect since even a few wind turbines will still have high visibility. It is also possible that the wind farm will become a tourist attraction and the impact is therefore not necessarily negative. A visitor centre with information on the wind farm as well as tours to wind turbines may enhance its positive aspects.

### Significance Statement

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale	Severity of Impact							
<b>Operational phase</b>										
Without mitigation	Long term	3	Regional	3	Slight	1	Definite	4	11	MODERATE-
With mitigation	Long term	3	Regional	3	Slight	1	Definite	4	11	MODERATE-
<b>No-Go</b>										
Without mitigation	Permanent	4	Regional	3	Slight	1	May Occur	2	10	MODERATE-
With mitigation	N/A		N/A		N/A		N/A			N/A

The duration of the impact is long term (and not permanent) since the turbines can be removed from the landscape after their life span has been reached. The extent is regional due to the visibility and size of the project. The severity of the impact is expected to be slight since the landscape has a low sensitivity to the development type. The likelihood of the impact occurring is definite due to the size of the wind farm and its components, their high visibility and the novelty aspect. The significance of the landscape impact according to the rating methodology is therefore expected to be **moderate** due to the long duration, extent and low severity of the impact.

In the event that the wind farm is not built (No-Go alternative) then it is likely that the landscape will remain the same for the foreseeable future.

### **Impact 10: Impact of shadow flicker on residents in close proximity to wind turbines**

#### Cause and Comment

Shadow flicker modelling has shown that only one building (a homestead) is at a slight risk of being affected more often than international guidelines suggest as the threshold at which mitigation measures should be implemented to reduce the impact. Residents of the house own the property on which the turbines will be installed.

#### Mitigation Measures

A number of mitigation measures can be discussed with the owner/resident of the house:

- Trees or high thicket are effective as a measure to reduce or eliminate the effect of shadow flicker. Windows where the shadow flicker effect will occur can be determined and trees can be planted such that the effect will be reduced.
- Determine which turbine (or turbines) is the main cause of the potential shadow flicker effect and reposition this turbine in the final layout (without increasing the shadow flicker effect for other buildings).
- Determine when the shadow flicker effect will be at its worst for the building and reduce the speed of the turbine rotor for this period.
- There also exist technology in the form of sensors which can be installed either in the room where shadow flicker is likely to occur, or on turbines which may cause shadow flicker

(Marks 2011) which can control rotor speed to reduce the effect.

**Significance Statement**

The duration or temporal scale of the effect is *long term* (3) (life time of the development). The spatial scale is *study area* (2) since only a small number of residents living within 1km of a turbine may be affected. Only one building will be affected slightly more than the threshold set by the guidelines which makes for a *slight severity* (1), and the likelihood that the effect occurs for these buildings is possible (*may occur* (2)) since the shadow flicker modelling assumes a worst case scenario that is seldom if ever actualised. The significance of the impact is therefore rated as **moderate (8)** according to the rating methodology (effect = 6; likelihood = 2) before mitigation measures. Mitigation measures will reduce the likelihood of the impact occurring (i.e. hours of shadow flicker above threshold) to *unlikely* (1) which means the significance of the impact after mitigation is **low (7)**.

Impact	Effect						Risk or Likelihood	Total Score	Overall Significance	
	Temporal Scale	Spatial Scale		Severity of Impact						
<b>Operational phase</b>										
Without mitigation	Long term	3	Study Area	2	Slight	1	May Occur	2	8	<b>MODERATE-</b>
With mitigation	Long term	3	Study Area	2	Slight	1	Unlikely	1	7	<b>LOW-</b>
<b>No-Go</b>										
Without mitigation	N/A		N/A		N/A		N/A			<b>N/A</b>
With mitigation	N/A		N/A		N/A		N/A			<b>N/A</b>

**7.2.7 Agriculture**

**Impact 11: Possible change of use of agricultural land**

**Cause and Comment**

The construction of infrastructure for the erection of the turbines will impact on the current land use. The client has advised that the total area impacted upon by construction is 11.79 ha, itemised as follows:

Roads	86406.96 m <sup>2</sup>
Foundations	1039.08 m <sup>2</sup>
Hard-standings	30375 m <sup>2</sup>
Buildings	100 m <sup>2</sup>
Total (m <sup>2</sup> )	117921.04 m <sup>2</sup>
<b>Total (ha)</b>	<b>11.79 ha</b>

The project may require an authorisation in terms of the “change of use of agricultural land” and possible re-zoning and such a decision would be made by the Department of Agriculture – Eastern Cape

**Mitigation Measures**

The report writer has been advised that livestock are known to become used to the use/operation of the turbines and should be able to utilise grazing up to the footprint areas of the turbines. Existing cultivated arable lands are not impacted upon so production can continue on these. The total impacted area of 11.79 ha of the 2,500 ha, calculated as a percentage is 0.004716% of the study area. The 11.79 ha can be considered as natural grazing area. Assuming an average of 6 ha

per Large Stock Unit one can assume that the current carrying capacity will be reduced by 2 LSU. This can be considered as insignificant in terms of the overall carrying capacity of the remaining 2,488 ha.

It is recommended that the positioning of the turbines be discussed with staff of the Department of Agriculture to align the project with the Conservation of Agricultural Resources Act.

### Significance Statement

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale	Severity of Impact							
<b>Operation phase</b>										
Without mitigation	Permanent	4	Study Area	2	Moderate	2	May occur	2	10	MODERATE-
With mitigation	Short Term	1	Study Area	2	Slight	1	May occur	2	6	LOW-
<b>No-Go</b>										
Without mitigation	Permanent	5	Study Area	2	Moderately Beneficial	2	Don't Know	?	8+	MODERATE +
With mitigation	N/A		N/A		N/A		N/A			N/A

### 7.2.8 Socio-Economic Impact Assessment

#### Background

The Plan of Study (PoS) submitted with the Final Scoping Report (FSR) as approved by DEA did not identify a social impact assessment in the suite of specialist studies. However, given the concerns about impacts on tourism raised during the process, it has been decided to discuss the potential impacts in this report. In addition, and as discussed below, even if such an assessment was conducted for the proposed project, evidence from existing literature suggests that the findings, whether positive or negative, would be inconclusive.

#### Socio-Economic Concerns

The primary concerns, as captured in the Issues and Response Trail (Appendix D of this report), are firstly that the proposed development will negatively impact the tourism of the area and, secondly, that the tourism of another area will thus be boosted.

#### Impacts on land value

It is unlikely that anyone will be able to provide a reliable estimate as to the significance of any value changes (positive or negative) due to the establishment of the proposed project. The primary reason for this is that there are currently no wind farms in Mpumalanga and so it is not possible to accurately assess the extent to which the value of local private properties have been affected historically. While estate agents may be able to offer a subjective opinion on the matter, the only really reliable source of information is from studies that have reviewed actual property price trends over a number of years.

The most comprehensive study on the impact of wind farms on nearby property values was produced by the Berkeley Laboratory in 2009 (<http://eetd.lbl.gov/ea/ems/re-pubs.html>). It included a detailed statistical analysis of property transactions for 7 500 home sales for the period 1996 – 2007 in the USA and concluded that the view of wind farm facilities did not demonstrably impact sales prices. A similar study for Cornwall in the UK concluded that although house prices initially appeared to be impacted negatively, this was not due to the proximity to turbines. While the development of the proposed wind farm at Carolina may result in a reduction in the value of surrounding properties, it may also be argued that local property prices may benefit through either the expectation of potential income from similar developments in the area or the perception held by

some that wind farms are a symbol of a more sustainable future.

### **Impacts on tourism**

Although a viewshed analysis was included in the visual impact specialist report (see Volume 2), the analysis shows the areas from where the facility will theoretically be visible, it does not provide information on the expected visual intrusion. This is assessed by means of the visual exposure which takes into account the distance from the proposed development.

It is unlikely that any study at this stage would be able to provide an accurate assessment of the extent to which the visibility of the proposed facility would translate into a negative impact on the local tourism economy or broader eco-tourism operations. A review of available literature on the subject revealed a scarcity of verifiable data from Africa, but a number of studies have been conducted in Europe. Some of the findings of these are presented below.

A 2008 report prepared by the Glasgow Caledonian University for the Scottish Government ([www.scotland.gov.uk/publications/2008/03/07113554/0](http://www.scotland.gov.uk/publications/2008/03/07113554/0)) included a review of almost 50 studies and interviews with 380 tourists. 98% said that the visibility of wind farms would not affect future visits to the area. 48% of interviewees said that they liked to see wind farms, 24% were neutral and the remaining 28% felt that presence of wind turbines would affect future visits. A weakness of this report was that the actual visual exposure was not incorporated into the questions i.e. respondents were simply asked their opinion on the presence or absence of turbines rather than their proximity or level of intrusion on the landscape. The report concluded that although there is some foundation to the belief that wind farms will have an effect on tourism, the effects are small.

In a separate study conducted for the Wales Tourist Board (NFO WorldGroup, 2003), an attempt was made to determine the impact of wind turbines on the Welsh tourism industry which, like the Eastern Cape, relies on scenery, wild landscapes and an unspoilt environment. Stakeholders agreed that wind farms should be sited in locations where their environmental and visual impacts would be minimised but there was considerable division over the definition of a “no-go area”. Although most of the findings were not based on hard data, both positive and negative impacts were expected. Interviews with 266 tourists revealed that 37% of the respondents said that cellphone masts detracted from their experience while 23% said that wind farms and turbines would have a similar negative effect. This figure is similar to that derived from the Scottish survey discussed above.

The report also refers to case studies from Spain where the wind farm sector has seen rapid growth. Interestingly, several independent studies from that country have shown that despite this growth, there has been no negative impact on the local tourism industry. Mention is also made of positive impacts including “green tourism” when an area is promoted by sustainable energy sources.

### **Conclusions**

Although it is acknowledged that case studies from the European context do not make a perfect comparison to the local Eastern Cape context, the findings of the abovementioned studies are nonetheless useful. They serve to provide some insights into the expected reaction of tourists to the presence of wind farms until such time as local case studies, based on reliable data, are available. Based on these European case studies, it appears that while there may be a negative impact on tourism, the actual significance may not be as high as initially expected by the tourism sector. In addition, examples from Spain suggest that the application of new marketing strategies could leverage a competitive advantage for the local eco-tourism sector by promoting the access of local establishments to clean energy.



## CONCLUSIONS AND RECOMMENDATIONS

In terms of section 31 (2) of the EIA regulations (2010), *an environmental impact assessment report must include:-*

- (n) *A reasoned opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;*
- (o) *An environmental impact statement which contains -*
  - (i) *a summary of the key findings of the EIA; and*
  - (ii) *a comparative assessment of the positive and negative implications of the proposed activity and identified alternatives.*

In line with the above-mentioned legislative requirement, this Chapter of the EIR provides a summary of the findings of the proposed Plan 8 Grahamstown Wind Energy Project EIA process, a comparative assessment of the positive and negative implications of the proposed project and identified alternatives. In addition, this Chapter provides the EAP's opinion as to whether the activity should or should not be authorised as well as the reason(s) for the opinion.

### 8.1 Summary of the Key Findings of the EIA

The proposed wind farm is medium in stature (27 turbines), compared to other wind farm developments and there will be few areas in the region that will not have views on a turbine or at least a moving blade on the horizon due to the lay of the surrounding topography.

There are several sensitive visual receptors on surrounding farms which may be affected by the proposed wind farm development, but their current views are likely to contain elements which reduce the quality of these views. Shadow flicker analysis conducted on potentially sensitive receptors indicated that only one farmstead will be affected by more than the threshold of 30 minutes a day/ 30 hours a year. This farmstead will experience slightly more than 35 and a half hours per year of shadow flicker. However, as the assumptions of the model were based on worst case scenarios and the farmstead is surrounded by trees, it is unlikely to breach the upper limit of the threshold.

In terms of noise impacts there will be an impact on the immediate surrounding environment from the construction activities, especially if pile driving is to be done. This however will only occur if the underlying geological structure requires piled foundations. The area surrounding the construction site will be affected for a short periods of time in all directions, should several pieces of construction equipment be used simultaneously. The number of construction vehicles that will be used in the project will add to the existing ambient levels and will most likely cause a short term disturbing noise. The ambient day time noise level, measured on the 10<sup>th</sup> of November 2011 at the Peyneskraal and Jakkeldraai NSAs, was 47.55 dB. The ambient night time noise level, measured on the 23<sup>rd</sup> of July 2012, at the Peyneskraal, Jakkeldraai and Honey Kop NSAs was 36.57 dB.

The noise produced by the Nordex N100 wind turbines will exceed the 45dB(A) day/night limit at both the main farm house and workers houses at Peynes Kraal at wind speeds of between 6 m.s<sup>-1</sup> & 12 m.s<sup>-1</sup>. Only the main farmstead will be affected by the Nordex N90 turbine at 12 m.s<sup>-1</sup> although the ambient noise of the wind at that speed will mask the noise generated by the turbine.

The proposed facility has the potential to significantly impact on avifauna in the area, although specialist confidence in this assessment is low/moderate, due to the lack of operation experience of commercial scale wind farms in South Africa. It is predicted that bird mortalities as a result of turbine or power line collisions will occur, the frequency and significance of which will have to be subject to on-going monitoring activity on site.

Bat fatalities as a result of the proposed project are likely to be of low significance after mitigation. It is important to note however, that there is currently no information available on bat fatalities, and their causes at wind farms in South Africa, therefore this EIA assumed the worst-case scenario. In addition, as the watercourses and farm dams can draw bats from the larger area, they are therefore assigned a High Sensitivity and buffered with 150 metres.

The localities of turbines within the areas marked as sensitive should be critically revised. These turbines are too close to the rivers or drainage valleys, their woody and dense slopes and associated drainage. It is highly likely that bat foraging activity is constantly elevated in these areas compared to the rest of the site.

With regard to the vegetation on the proposed wind energy facility site, the wind farms have very little impact on the vegetation post construction and it may be possible to retain the areas of moderate sensitivity as corridor areas. It should be noted that the presiding sensitivity was based on the flora and vegetation as the vegetation units, representing habitats, and show varying degrees of ecological integrity and that these values directly influenced the impact rating scores.

In general, the anticipated terrestrial ecological impacts on the fauna and flora of the receiving environment will be of low significance, with no high sensitive areas reported.

As the overall impact on paleontological heritage of the proposed wind farm project is of very low negative significance and will not compromise local fossil heritage. It is has therefore been recommended that exemption from further specialist paleontological studies be granted for the Wind Energy Project.

With regard to impacts on heritage sites in cases where the turbines would be erected in close vicinity of sites, it is recommended buffer zones of at least 15m from the outer edge of each heritage site are set out prior to construction taking place.

In general, turbine placement is recommended upon hilltop sites and is recommended that as many turbine positions as possible be moved to hilltops, or at least the upper hill slopes.

The No-Go Option will have two highly beneficial/positive impacts with regards to the following:

- Faunal biodiversity
- Faunal SSC

The continuation of the current land use in the project area, the vast majority of no-go impacts will be in effect a conservation measure, resulting in the prevention of habitat degradation (bats), and the restoration of any visible/uncovered archaeological remains and the prevention of elevated noise levels arising from both construction and operational phases.

Figure 8-1 and 8.2 below show the identified site sensitivities and how this has been taken into account in the revised layout depicted in this figure as well as in Chapter 2.

Figure 8-3 and 8-4 show the turbine and infrastructure layout that has been developed to avoid all the sensitive areas depicted in figure 8-1 and 8-2. This is the final EIA phase layout presented.

A summary of the various construction and operational phase and no-go impacts are contained in Tables 8-1 to 8-3 below.

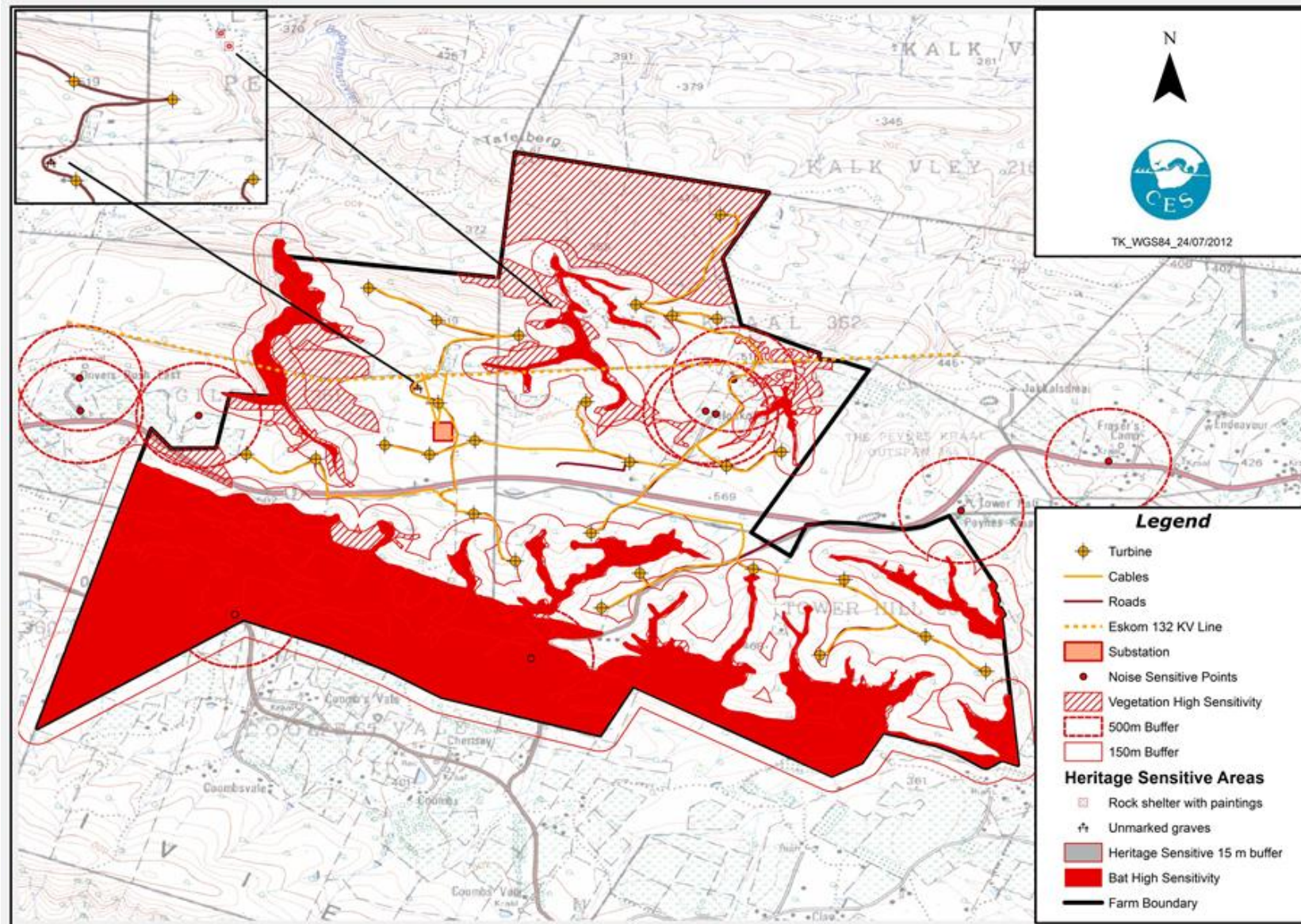


Figure 8-1: Turbine layout subject to EIA phase assessment, including existing/proposed access roads and cable layouts in relation to identified sensitivities



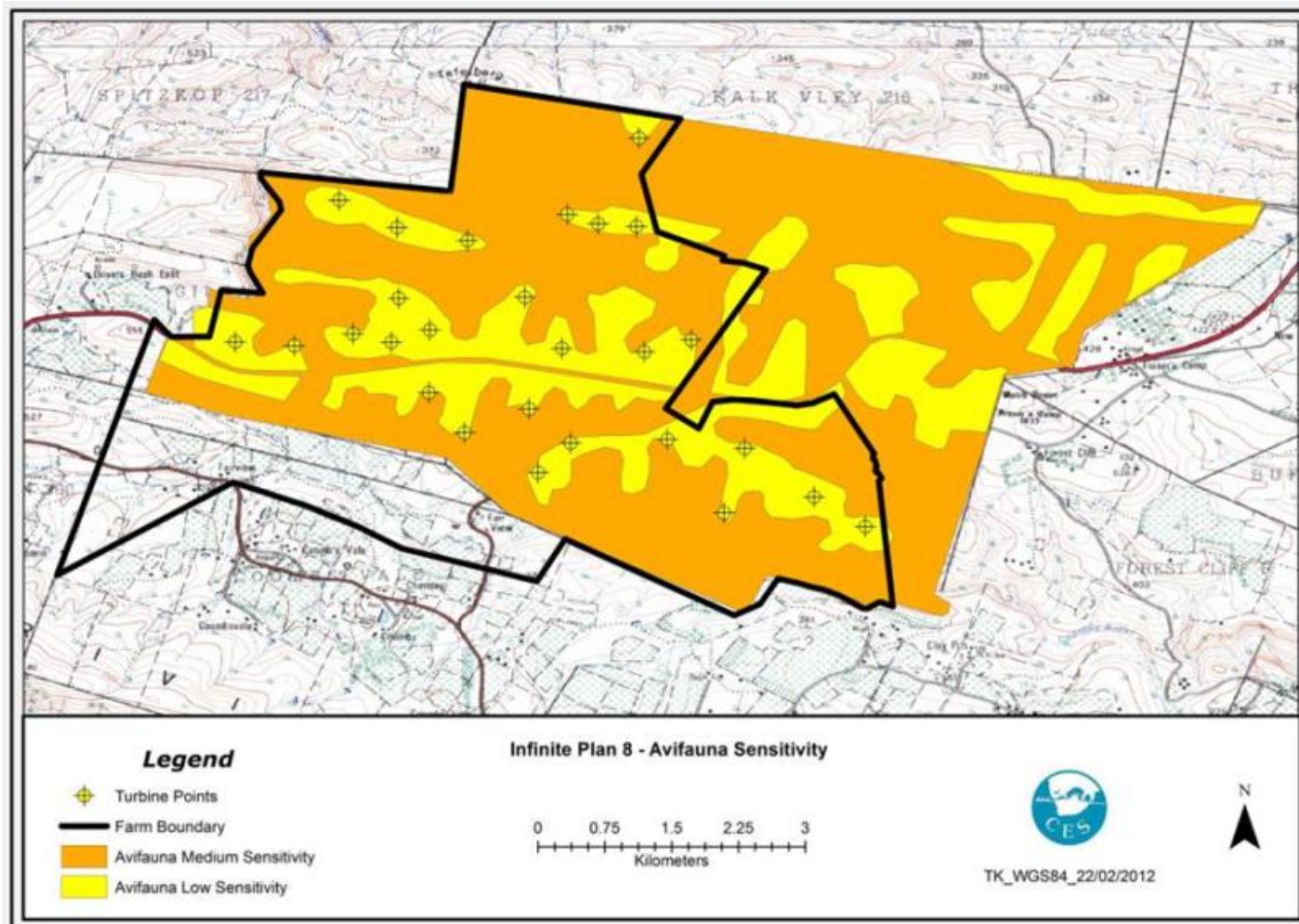


Figure 8-2: Bird Sensitive Areas. It was recommended by the specialist that no turbines be placed in the medium sensitivity areas – shown here in orange.



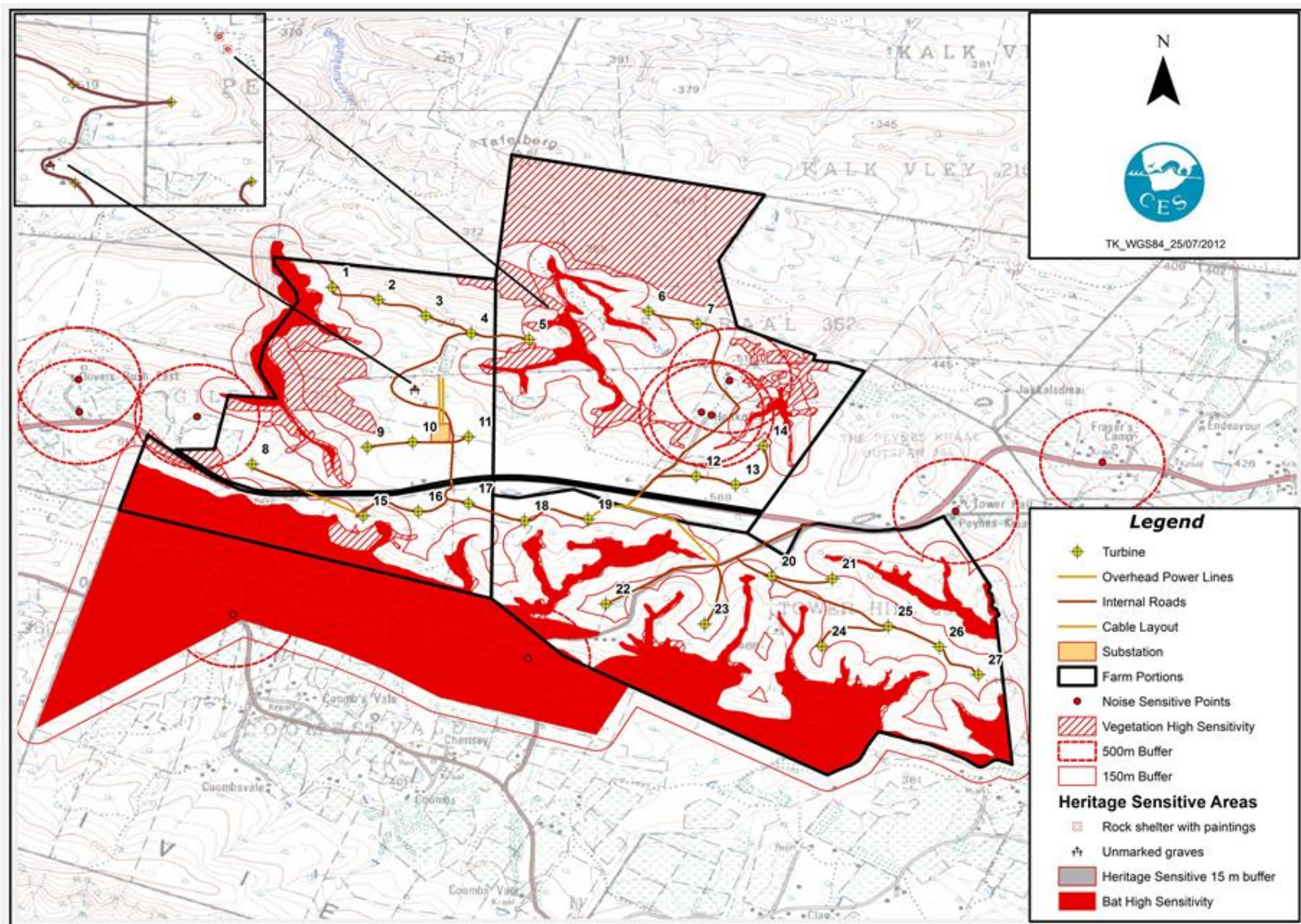


Figure 8-3: The final EIA phase layout, depicted in relation to bat, heritage, ecological and noise sensitive areas.



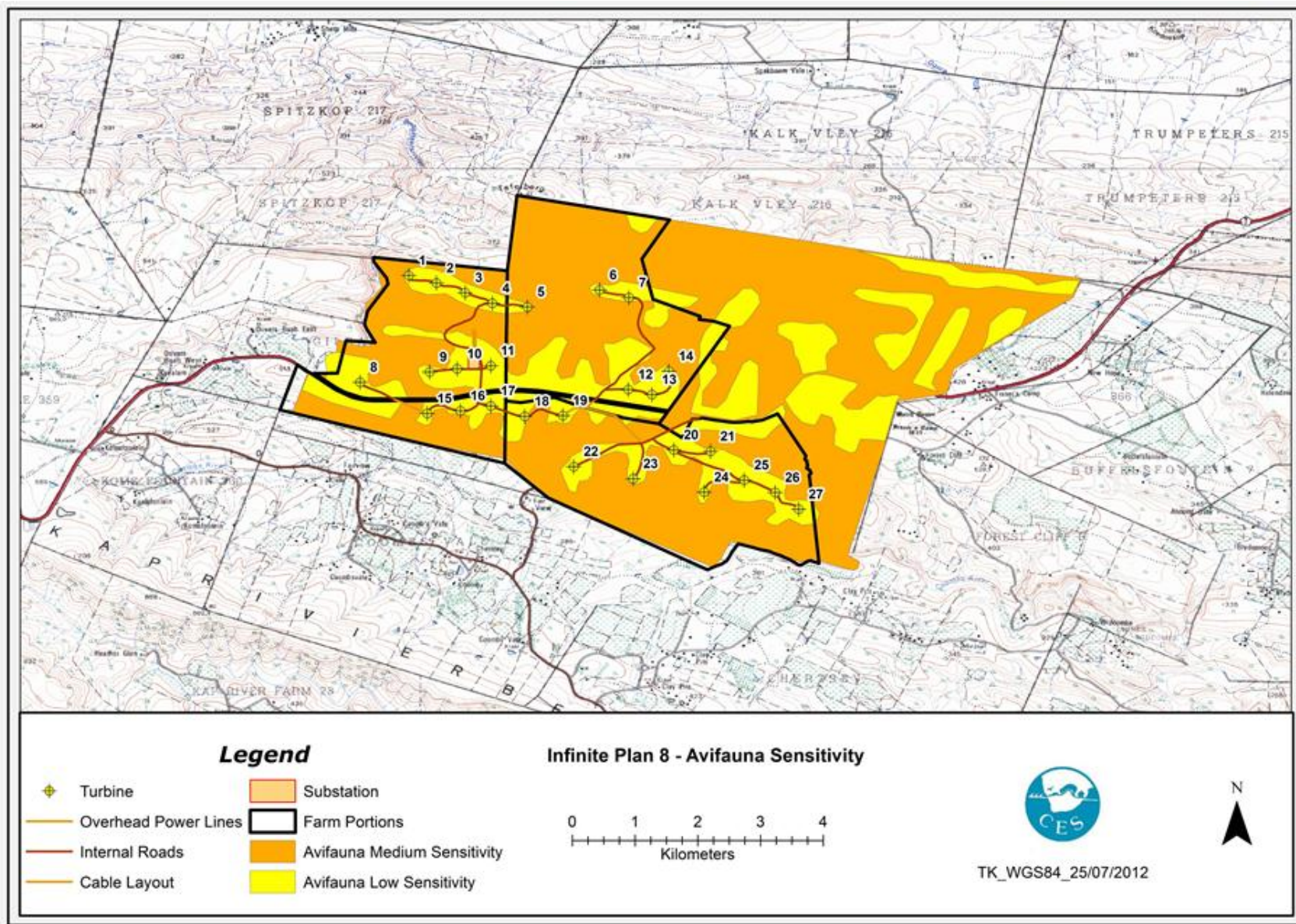


Figure 8-4: The final EIA phase layout depicted in relation to the bird sensitive areas.



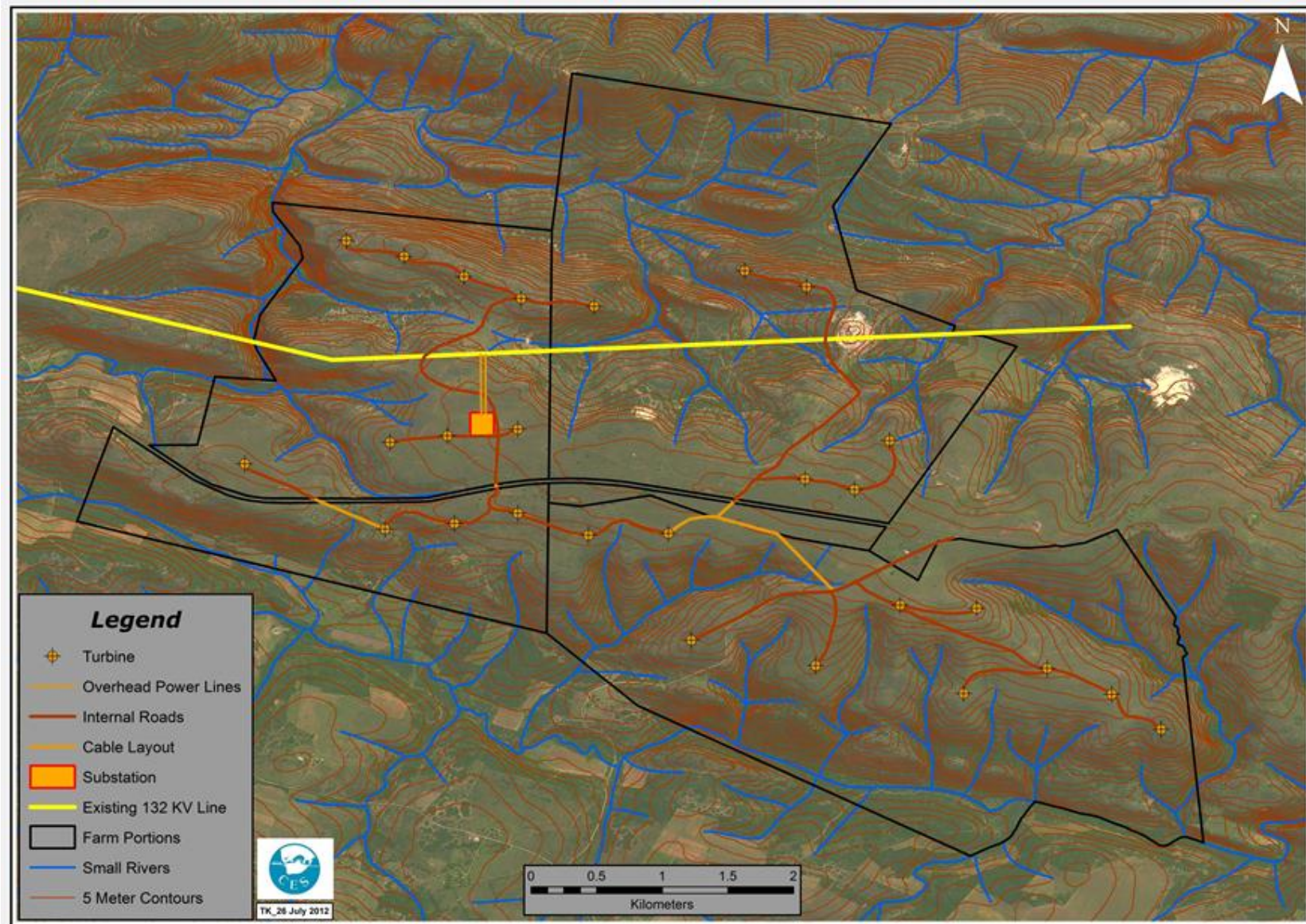


Figure 8-5: The positioning of final project infrastructure in relation to drainage lines.

Table 8-1: Summary of the impacts associated with the proposed Plan 8 Grahamstown Wind Energy Project during the construction phase

Construction Phase				
Impact Study	Impact #	Impact Type	Significance	
			Without mitigation	With mitigation
Ecological	1	Loss of Degraded thicket	LOW-	LOW-
	2	Loss of Fynbos	LOW-	LOW-
	3	Loss of Fynbos, Thicket, Karoo mosaic	LOW-	LOW-
	4	Loss of Thicket mosaic	LOW-	LOW-
	5	Loss of plant species of special concern	HIGH-	LOW-
	6	Loss of animal species of special concern	LOW-	LOW-
	7	Loss of Biodiversity	MOD-	LOW-
	8	Fragmentation of vegetation and edge effects	LOW-	LOW-
	9	Invasion of alien species	MOD-	MOD+
Avifauna	10	Habitat destruction	LOW-	LOW-
	11	Disturbance of birds	MOD- to LOW-	LOW-
Bat	12	Destruction of bat foraging habitat	MOD-	LOW-
	13	Destruction of bat roosts	MOD-	LOW-
Heritage	14	Impact on heritage resources	MOD-	LOW-
Noise	15	Potential construction noise sources (construction vehicles)	LOW-	LOW-
Visual	16	Impact of construction activities on sensitive visual receptors	HIGH-	HIGH-
	17	Intrusion of large, highly visible wind turbines on the existing views	HIGH-	HIGH-
	18	Impact of night lights of a wind farm on existing night scape	MOD-	MOD-
Agriculture	19	Loss of vegetation	VERY HIGH-	HIGH-
	20	Pollution of water sources	HIGH-	MODERATE-
	21	Erosion and construction on land with a gradient	VERY HIGH-	MODERATE-

Table 8-2: Summary of the impacts associated with the proposed Plan 8 Grahamstown Wind Energy Project during the operational phase

Operational Phase				
Impact Study	Impact #	Impact Type	Significance	
			Without mitigation	With mitigation
Ecological	1	Invasion of alien species	HIGH-	MOD+
Avifauna	2	Bird collision and electrocution on overhead power lines, Impact on Red Listed and other species	MOD -	LOW -
	3	Bird disturbance and displacement from area as result of wind turbines and other infrastructure	LOW -	LOW -
	4	Bird collision with turbine blades	MOD -	MOD -
Bat	5	Bat mortalities during foraging by turbine blades	HIGH-	MOD-
	6	Bat mortalities during migration by turbine blades	HIGH-	MOD-
Heritage	7	Impact on heritage resources	MOD-	LOW-
Noise	8	Predicted noise levels for wind turbine generators	HIGH-	LOW-
Visual	9	Potential landscape impact	MOD-	MOD-
	10	Impact of shadow flicker on residents in close proximity to wind turbines	MOD-	LOW-
Agriculture	11	Possible change of use of agricultural land	MOD-	LOW-

Table 8-3: Summary of the impacts associated with the proposed Plan 8 Grahamstown Wind Energy Project assuming the NO-GO option

No Go				
	Impact Study	Impact #	Impact Type	Significance
CONSTRUCTION	Ecological	1	Loss of Degraded thicket	MOD-
		2	Loss of Fynbos	MOD-
		3	Loss of Fynbos, Thicket, Karoo mosaic	MOD-
		4	Loss of rocky Fynbos	N/A
		5	Loss of Thicket	N/A
		6	Loss of Thicket mosaic	MOD-
		7	Loss of plant species of special concern	MOD-
		8	Loss of animal species of special concern	MOD-
		9	Loss of Biodiversity	MOD-
		10	Fragmentation of vegetation and edge effects	LOW-
		11	Invasion of alien species	HIGH-

	<b>Avifauna</b>	<b>12</b>	Habitat destruction	N/A
		<b>13</b>	Disturbance of birds	N/A
	<b>Bat</b>	<b>14</b>	Destruction of bat foraging habitat	MOD+
		<b>15</b>	Destruction of bat roosts	MOD+
	<b>Heritage</b>	<b>16</b>	Impact on heritage resources	MOD+
	<b>Noise</b>	<b>18</b>	Potential construction noise sources (construction vehicles)	MOD+
	<b>Visual</b>	<b>19</b>	Impact of construction activities on sensitive visual receptors	N/A
		<b>20</b>	Intrusion of large, highly visible wind turbines on the existing views of sensitive visual receptors	N/A
		<b>21</b>	Impact of night lights of a wind farm on existing night scape	N/A

<b>OPERATIONAL</b>	<b>Ecological</b>	<b>1</b>	Invasion of alien species	<b>HIGH-</b>
	<b>Avifauna</b>	<b>2</b>	Bird collision and electrocution on overhead power lines, Impact on Red Listed and other species	N/A
		<b>3</b>	Bird disturbance and displacement from area as result of wind turbines and other infrastructure	N/A
		<b>4</b>	Bird collision with turbine blades	N/A
	<b>Bat</b>	<b>5</b>	Bat mortalities during foraging by turbine blades	N/A
		<b>6</b>	Bat mortalities during migration by turbine blades	N/A
	<b>Heritage</b>	<b>7</b>	Impact on heritage resources	MODERATE+
	<b>Agriculture</b>	<b>8</b>	Not proceeding with wind farm construction	MODERATE-
	<b>Noise</b>	<b>9</b>	Predicted noise levels for wind turbine generators	MODERATE+
	<b>Visual</b>	<b>10</b>	Potential landscape impact	MODERATE+
		<b>11</b>	Impact of shadow flicker on residents in close proximity to wind turbines	N/A



## 8.2 EAP's Recommendation

The decision regarding whether to proceed with the proposed development should be based on weighing up the positive and negative impacts as identified and assessed by the independent specialists. In addition to the findings of the specialist studies, it is also necessary to consider the following when making a decision:

- The majority of the impacts associated with the proposed project can be mitigated by applying specialist study findings and recommendations or the realignment of a minimum number of turbines (albeit that they may potentially be in less efficient locations for electricity generation) and this is reflected further on in this report;
- The refined layout referred to above takes the identified environmental sensitivities and constraints into account in delineating road access, construction phase infrastructure and laydown area requirements;
- With regards to the two points above, it is suggested that turbines 1, 15 and 20 of the final layout presented in this report be moved slightly to avoid the 150 m buffer around bat sensitive areas;
- The nature of the site on which the facility is to be sited is suited to the development proposal with easy access provided from the N2 highway and relative proximity to the ports of Coega and Port Elizabeth;
- The project proponent has taken the issues raised by interested and affected parties into consideration and made changes to the layout where possible;
- The project has extensive potential environmental and socio-economic benefits including the generation of clean energy for Makana Local Municipality (MLM);
- The project will contribute directly and significantly to social upliftment of the local community; and
- This EIA process has enabled the provision of accurate and relevant information required for informed decision making.

Based on the above, it is believed that, with the implementation of appropriate mitigation measures and understanding that certain visual impacts cannot be mitigated, the cumulative benefits of the proposed Plan 8 Grahamstown Wind Energy Project will outweigh the negative impacts and it is the opinion of the EAP that the No-Go option should not be considered any further, and that the proposed Plan 8 Grahamstown Wind Energy Project should be granted authorisation.

In addition to this the proposed project will aid in:-

- The reduction of greenhouse gases by the use of alternatives to fossil fuel - derived electricity will assist South Africa to begin demonstrating its commitment to meeting international obligations/legislative instruments such as the 1992 United Nations Framework Convention on Climate Change (FCCC) and the Kyoto Protocol (2002);
- Meeting the goals of the White Paper on the Energy Policy for South Africa (Energy White Paper) which aims to create energy security by diversifying energy supply and energy carriers and sets out the policy principles, goals and objectives to achieve, *"An energy economy in which modern renewable energy increases its share of energy consumed and provides affordable access to energy throughout South Africa, thus contributing to sustainable development and environmental conservation"*, and;
- The Department of Minerals and Energy (DME) (now the Department of Energy) Integrated Energy Plan (IEP) to develop the renewable energy resources, while taking safety, health and the environment into consideration setting a target of, *"10 000 GWh (0.8Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro"*.
- South Africa has also often experienced major power shortages largely as a result of demand outstripping supply. This, in many cases, has resulted in financial losses (many of the sectors contributing to the GDP are practically driven by electricity) and impacted on quality of life (hospitals and schools were among the affected, jobs were lost etc.). The

national power utility, Eskom, has indicated that South Africa is not past this crisis and that the possibility of further power cuts remains. With local generation, the networks can be freed up to supply power to other areas and the local community will have a much better chance of more consistent supply. It is anticipated that the project can supply more than the MLM's current daytime electricity demand during all seasons.

In addition to the above, the EAP recommends that the project only be granted authorisation under certain conditions, in order to address those impacts with a high significance rating, included in the table below. One such condition strongly suggested that the recommendations made in *Volume 4: Environmental Management Programme Proposed Plan 8 Grahamstown Wind Energy Project* (CES, January 2012) also be followed.

Of particular relevance is the recently developed avifauna and bat monitoring programme. It is recommended that this programme become a standard condition of authorisation for all wind energy projects. It is recommended that the DEA further refine these programmes (for birds and bats) as a standard condition of authorisation. These monitoring programmes will be invaluable in guiding the micro-siting of the turbines as more data becomes available.

Study	Phase	Impact	Mitigation Measures
Avifauna	Operation	Bird collision & electrocution on overhead power lines, Impact on Red Listed and other species	Bury all 'on site' power line underground. On power lines to grid, mark certain sections of the line with anti collision marking devices on the earth wire to increase the visibility of the line and reduce likelihood of collisions. High risk sections of line can only be identified once the route of the power lines is available. Bird friendly pole/pylon designs should be used to prevent electrocutions.
		Bird disturbance and displacement from area as result of wind turbines and other infrastructure	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. Pre-construction monitoring will establish baseline data against which this impact can be evaluated.
		Bird collision with turbine blades	This is extremely difficult to mitigate for post construction. Sensitivity mapping and pre-construction monitoring should inform the final turbine layout in order to proactively mitigate for this. If key species are found to collide in significant numbers post construction then mitigation options such as painting turbine blades, blade height adjustment and curtailment will need to be implemented.
	Construction	Disturbance of birds, Impact on Red Listed and other species during construction	Strict control should be maintained over all activities during construction, in particular heavy machinery and vehicle movements, and staff. It is difficult to mitigate fully for this as some disturbance is inevitable. If pre-construction monitoring discovers any breeding target species, the specialist will develop case specific recommendations for management of the situation

Study	Phase	Impact	Mitigation Measures
		Destruction or alteration of bird habitat, Impact on Red Listed and other species	Strict control should be maintained over all activities during construction, in particular heavy machinery and vehicle movements, and staff. It is difficult to mitigate fully for this as some habitat destruction is inevitable. Existing roads should be used as much as possible, as well as avoiding sensitive areas identified by this study.
Noise	Construction	Potential construction noise sources	<p>All construction operations should only occur during daylight hours if possible.</p> <p>No construction piling should occur at night. Piling should only occur during the day to take advantage of unstable atmospheric conditions.</p> <p>Construction staff should receive “noise sensitivity” training.</p> <p>An ambient noise survey should be conducted during the construction phase.</p> <p>The noise impact should be remodelled when the micro-siting of the turbines take place.</p>
Noise	Operation	Predicted noise levels for wind turbine generators	<p>Wind Turbine Generators 15 and 17 should be moved slightly further from the main house and workers houses at Peyneskraal during the micrositing phase.</p> <p>The noise impact from the wind turbine generators should be measured during the operational phase, to ensure that the impact is within the recommended rating limits.</p>
Agriculture	Operation	Possible change of use of agricultural land	No mitigation required as grazing can continue on the land unimpeded. Department of Agriculture, Forestry and Fisheries has been informed of the project, and has had an opportunity to comment on the turbine and infrastructure layout.
	Construction	Loss of vegetation	Permits may be required for the removal and transplanting of listed, protected species. A plant “search and rescue” operation should be conducted prior to construction (see ecological mitigation measures).
		Pollution of water sources	<p>Construction activities adjacent to watercourses should not be closer than 100 m from the 1-in-100 year flood levels.</p> <p>Turbines should be sited at least 100 m away from earth dams and boreholes.</p> <p>Access roads must be provided with adequate drainage structures to control run-off water.</p> <p>A routine maintenance regime should be implemented as part of the operational plan for the lifespan of the project.</p>
		Erosion and construction on land with a gradient	A construction regime should be specified by the design engineer to limit and control loss of vegetation and resultant increased run-off of storm water.
Ecological	Construction	Loss of	Keep removal of vegetation to a minimum.

Study	Phase	Impact	Mitigation Measures
		Degraded Thicket	Set aside part of the project area for conservation. Do not remove vegetation in areas set aside for conservation.
		Loss of Fynbos	Keep removal of vegetation to a minimum. Set aside part of the project area for conservation. Do not remove vegetation in areas set aside for conservation.
		Loss of Fynbos, thicket, karoo mosaic	Keep removal of vegetation to a minimum. Set aside part of the project area for conservation. Do not remove vegetation in areas set aside for conservation.
		Loss of Thicket Mosaic	Keep removal of vegetation to a minimum. Set aside part of the project area for conservation. Do not remove vegetation in areas set aside for conservation.
		Loss of plant species of special concern	Areas containing species of special concern should be noted and every effort made to reduce the impacts of construction on these sections of vegetation. SSC in any area to be cleared should be identified and rescued. Some SSC will not transplant. These individuals should, as far as possible, be left untouched.
		Loss of animal species of special concern	If any fencing is to be done; the fences should have enough space between wires for small animals to move across them uninhibited. Workers should also be educated on conservation and should not be allowed to trap animals on site.
		Loss of biodiversity	An area within the site that can be set aside for conservation and actively managed as a corridor area would be ideal to mitigate loss of biodiversity. It is recommended that as much as possible of the high sensitivity areas be set aside as conservation areas and be managed as such by the land owners and wind farm developers.
		Disruption of ecosystem function and process	Fragmentation is unlikely to occur due to the nature of the development. However, it is important to make sure all fences have wide enough mesh to let small animals through, and that large areas of vegetation are not cleared, especially for roads
		Invasion of alien species	Removal of existing alien species should be consistently done.  Rehabilitation of disturbed areas after the construction of the wind energy facility should be done as soon as possible after construction is completed.  Invasive plant species are most likely to enter the site carried in the form of seeds by construction vehicles and staff; these should be cleaned before entering the site to prevent alien infestation.
		Operation	Invasion of alien species

Study	Phase	Impact	Mitigation Measures
			<p>Invasive plant species are most likely to enter the site carried in the form of seeds by vehicles and staff; these should be cleaned before entering the site to prevent alien infestation.</p>
Visual	Operation	Introducing highly visible wind turbines into a rural-agricultural landscape	<p>There are no mitigation measures that can reduce the perception of a negative impact significantly unless the site is avoided. But there are a number of measures that can enhance the positive aspects of the impact. It has been shown that uncluttered sites are preferred for wind farms (Gipe, 1995; Stanton, 1996; Vissering, 2005). In view of this the following mitigation measures and suggestions may enhance the positive visual aspects of the development:</p> <ul style="list-style-type: none"> <li>• Ensure that there are no wind turbines closer than 500m to a residence or farm building.</li> <li>• Maintenance of the turbines are important. A spinning rotor is perceived as being useful. If a rotor is stationary when the wind is blowing it is seen as not fulfilling its purpose and a negative impression is created (Gipe, 1995).</li> <li>• Signs near wind turbines should be avoided unless they serve to inform the public about wind turbines and their function. Advertising billboards should be avoided.</li> <li>• According to the Aviation Act, 1962, Thirteenth Amendment of the Civil Aviation Regulations, 1997: "Wind turbines shall be painted bright white to provide maximum daytime conspicuousness. The colours grey, blue and darker shades of white should be avoided altogether. If such colours have been used, the wind turbines shall be supplemented with daytime lighting, as required."</li> <li>• Lighting should be designed to minimise light pollution without compromising safety. Investigate using motion sensitive lights for security lighting. Turbines are to be lit according to Civil Aviation regulations.</li> <li>• An information kiosk (provided that the kiosk and parking area is located in a low visibility area) and trails along the wind farm can enhance the project by educating the public about the need and benefits of wind power. 'Engaging school groups can also assist the wind farm proponent, as energy education is paramount in developing good public relations over the long term. Instilling the concept of sustainability, and creating awareness of the need for wind farm developments, is an important process</li> </ul>



Study	Phase	Impact	Mitigation Measures
		Shadow flicker effect	<p>that can engage the entire community' (Johnston, 2001).</p> <p>A number of mitigation measures can be discussed with the owner/resident of the house:</p> <ul style="list-style-type: none"> <li>• Trees or high thicket are effective as a measure to reduce or eliminate the effect of shadow flicker. Windows where the shadow flicker effect will occur can be determined and trees can be planted such that the effect will be reduced.</li> <li>• Determine which turbine (or turbines) is the main cause of the potential shadow flicker effect and reposition this turbine in the final layout (without increasing the shadow flicker effect for other buildings).</li> <li>• Determine when the shadow flicker effect will be at its worst for the building and reduce the speed of the turbine rotor for this period.</li> <li>• There also exist technology in the form of sensors which can be installed either in the room where shadow flicker is likely to occur, or on turbines which may cause shadow flicker (Marks 2011) which can control rotor speed to reduce the effect.</li> </ul>
Visual	Construction	Intrusion of large and highly visible construction activity on sensitive viewers	<p>The most obvious causes of impact cannot be mitigated for since the turbines are so tall and they are to be installed on a relatively flat coastal plain which is visible from much of the surrounding landscape. The duration of the impact is short, though, and there are a number of mitigation measures that will curtail the intensity to some extent:</p> <ul style="list-style-type: none"> <li>• Construction of new roads should be minimised and existing roads should be used where possible.</li> <li>• The contractor should maintain good housekeeping on site to avoid litter and minimise waste.</li> <li>• Clearance of indigenous vegetation should be minimised and rehabilitation of cleared areas should start as soon as possible.</li> <li>• Erosion risks should be assessed and minimised as erosion scarring can create areas of strong visual contrast which can often be seen from long distances.</li> <li>• Laydown areas and stockyards should be located in low visibility areas (e.g. valleys between ridges) and existing vegetation should be used to screen them from views where possible.</li> <li>• Night lighting of the construction sites should be minimised within requirements of safety and efficiency. See section on lighting for more specific measures.</li> <li>• Fires and fire hazards need to be managed appropriately.</li> </ul>
		Impact of night	The aviation standards have to be followed and

Study	Phase	Impact	Mitigation Measures
		lights on existing nightscape	no mitigation measures are applicable in terms of marking the turbines. Lighting of ancillary buildings and structures should be designed to minimise light pollution without compromising safety. Motion sensitive lighting can be used for security purposes.
Heritage	Construction and Operation	Impact on heritage resources	<p>It is recommended that;</p> <ul style="list-style-type: none"> <li>• Because of the overall lack in archaeological remains, it is suggested that – from an archaeological perspective - the proposed development may move beyond the scoping phase of assessment,</li> <li>• Surveyed areas (walk tracks) – with the exception of waypoints 1 and 34-35 – are suitable for the proposed activities,</li> <li>• Any areas outside the surveyed tracts might be archaeologically sensitive and therefore, placement of any activities outside the studied areas will require further archaeological investigation and assessment,</li> <li>• Once the final layout and placement of wind turbines and associated facilities and services are determined, an Archaeological Impact Assessment focusing on the affected areas should be undertaken,</li> <li>• Because shales occur in the study area the presence of fossils cannot be ruled out and therefore, a Palaeontological Impact Assessment (Desktop Study) should be conducted, and</li> </ul> <p>It is required that;</p> <ul style="list-style-type: none"> <li>• In the event that vegetation clearing and earthmoving activities expose archaeological materials, such activities must stop and the South African Heritage Resources Agency must be notified immediately.</li> <li>• If archaeological materials are exposed during vegetation clearing and/or earth moving activities, then they must be dealt with in accordance with the National Heritage Resources Act (No. 25 of 1999) and at the expense of the developer.</li> <li>• In the event of exposing human remains during construction, the matter will fall into the domain of the South African Heritage Resources Agency (Mrs. Colette Scheermeyer) and will require a professional archaeologist to undertake mitigation if needed.</li> </ul> <p>SAHRA recommends that:</p> <ul style="list-style-type: none"> <li>• The two unmarked graves that occur on site must be fenced off during construction. The fence should be 5</li> </ul>

Study	Phase	Impact	Mitigation Measures
			<p>meters from the edge of the graves.</p> <ul style="list-style-type: none"> <li>• Turbines should not be placed within 50 meters of the fence surrounding the graves. Access roads should not be placed within 20 meters of the fence surrounding the graves.</li> <li>• The old plough should be fenced off. If the landowner agrees it should be moved undercover or indoors to protect it from degradation.</li> <li>• The work force should be educated as to the archaeological significance of the rock art occurring on the site.</li> <li>• SAHRA or a professional should be contacted if any archaeological sites or artefacts, palaeontological fossils, graves or other heritage resources are found during construction.</li> </ul>
Bat	Construction	Destruction of bat foraging habitat	The footprint of the wind farm should be kept to a minimum, and areas designated as having a high sensitivity for bats be excluded from development.
		Destruction of bat roosts	Areas designated as having a high sensitivity for bats must be excluded from development.
Bat	Operation	Bat mortalities during foraging and migration	<ul style="list-style-type: none"> <li>• Turbines should be curtailed during times when bats are active, low wind speeds at night is the best time (and when little electricity is being generated by the turbines).</li> <li>• It is recommended that bat fatalities, and their causes at the wind farm are monitored, as there is no information available for wind farms in South Africa. More applicable mitigation measures to reduce bat fatalities (see below) can be applied when there is more information.</li> <li>• Ultrasound broadcast can deter bats from flying into wind turbines. (Szewczak and Arnett 2007)</li> <li>• Minimizing turbine height will help to reduce bat fatalities (Barclay <i>et al.</i>, 2007).</li> <li>• Turbine site placement around water bodies (dams) should be avoided (Brinkman <i>et al.</i>, 2006).</li> <li>• Wind turbine operating times should be restricted during times when bat activity is high (Brinkman <i>et al.</i>, 2006). Bats are at higher risk of fatality on nights with low wind speeds (Horn <i>et al.</i>, 2008). This is to be better assessed after sonar mitigation techniques are evaluated and assessed.</li> </ul>

### 8.3 The Way Forward

Following public review, this EIR, together with the Specialist Volume (Volume 2) and the EMP (Volume 4), have been amended as necessary and finalised, incorporating any comments received. It will now be submitted to the DEA.

Within 60 days of the receipt of the Final EIR, the competent authority must in writing either:

- Accept the report

- Notify the applicant that the report has been referred for specialist review
- Request that the applicant make amendments to the report in order for it to be accepted
- Reject the report

Within 45 days of accepting the report, the competent authority must:

- Grant an authorisation for all or part of the activities applied for
- Refuse an authorisation for all or part of the activities applied

Should an Environmental Authorisation be granted, it will carry Conditions of Approval. The project proponent is obliged to adhere to these conditions.

Within a period determined by the competent authority, all registered I&APs will be notified in writing of (i) the outcome of the application, and (ii) the reason for the decision. The public will then be given an opportunity to appeal the decision should they wish to do so. The appeals procedure, which is described in detail in the NEMA EIA Regulations, will also be communicated to I&APs by the EAP.

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## **APPENDICES**

<b>APPENDIX A:</b>	<b>THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS</b>
<b>APPENDIX B:</b>	<b>CORRESPONDENCE FROM AUTHORITIES</b>
<b>APPENDIX C:</b>	<b>PLAN OF STUDY APPROVAL</b>
<b>APPENDIX D:</b>	<b>PUBLIC PARTICIPATION</b>
<b>APPENDIX E:</b>	<b>COPIES OF TITLE DEEDS</b>
<b>APPENDIX F:</b>	<b>LETTER FROM DWA CONFIRMING WATER AVAILABILITY FOR CONSTRUCTION PHASE</b>

## **APPENDIX A: THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS**

The Environmental Impact Assessment process comprises two key phases – the Scoping Phase and the Environmental Impact Assessment Phase. These phases are described in detail below.

### **A1. THE SCOPING PHASE**

Scoping is the first step in the EIA process. It allows for all role players – stakeholders and Interested and Affected Parties (I&APs) - to gain a greater understanding of the project by means of a public participation process. Scoping is also critical in as much as it facilitates the early identification of important natural and social issues that will need to be considered later in the process.

The principal objectives of the Scoping Phase are:-

- Describe the nature of the proposed project;
- Preliminary identification and assessment of potential environmental issues or impacts to be addressed in the subsequent EIA phase;
- Define the legal, policy and planning context for the proposed project;
- Describe important biophysical and socio-economic characteristics of the affected environment;
- Undertake a public participation process that provides opportunities for all I&APs to be involved;
- Identify feasible alternatives that must be assessed in the EIA phase; and
- Define the Plan of Study (PoS) for the EIA phase.

Each of the steps involved in the scoping phase is discussed in detail below.

#### **A1.1. Project description**

A description of the components of the proposed project is provided.

#### **A1.2. Preliminary assessment of the project**

Baseline data and information on the proposed development is collected, primarily from the project proponent, but also from preliminary site surveys and published literature, and from legislation, guidelines and other regulatory instruments, in order to determine the activities for which approval must be sought from the competent environmental authority.

Information sourced from the project proponent includes the proposed location and layout of the development, and the technology to be adopted. A preliminary assessment of this data and information, in the context of legal requirements and an understanding of the receiving environment, is by way of a preliminary risk assessment or fatal flaw analysis. It enables major risks to the project or to the receiving environment to be identified at an early stage in the EIA process, and informs subsequent decisions about aspects of the development identified as being potentially problematic.

#### **A1.3. Legal context**

The legislation relevant to the proposed Project is identified and reviewed.

#### **A1.4. Identification of key bio-physical and socio-economic issues**

The key biophysical and socio-economic issues related to the project are identified during the Scoping Phase. Relevant information is drawn from as wide a range of sources as possible, including local authorities, local communities, and specialists.

### **A1.5. Public Participation Process**

A public participation process is an explicit requirement of the NEMA EIA regulations, and must take place throughout the EIA process. The approach to public consultation depends largely on the location of the proposed development, the nature of the project, the sensitivity of the receiving environment, the previous level of exposure of the public to the EIA process, and the level of education of those who will be affected by the proposed development. Among other things, involvement of the public in the EIA process is an opportunity to gather local knowledge from individuals, communities and organisations.

Key stakeholders are identified and notified of the proposed development and the ways in which they can be involved. These stakeholders include:-

- Local and regional authorities
- Ratepayers associations
- Ward councillors and representatives
- Non-governmental Organisations (NGOs) and Community Based Organisations (CBOs)
- Landowners adjacent and close to the site of the proposed development.

Stakeholders and I&APs are informed of the proposed development by means of:-

- Advertisements in newspapers
- A background information document (BID)
- Letters to key stakeholders and neighbouring landowners/occupiers
- Notice boards placed at the site

All of the above must include name(s) and contact details - telephone and fax numbers, and e-mail address(es) to which stakeholders and I&APs can direct written or verbal comments.

Advertisements are placed in a minimum of one local and one regional newspaper, depending on the nature and extent of the proposed development. Stakeholders and I&APs are encouraged to register by sending their names and contact details to the EAP, whereupon they are sent a copy of the BID, and are thereafter kept informed of and involved in all subsequent stages of the EIA process. The BID is a brief document that provides information on the nature and location of the proposed development, and details of how the EIA process will be undertaken. However, it is unlikely that the final design specifications of some proposed developments are known at this stage, and there may be changes to the information presented in the BID as the project progresses.

In addition, public meetings, open house meetings and/or focus group meetings may be held. In the early stages of the Scoping Phase these meetings provide an opportunity for the Environmental Assessment Practitioner (EAP) to present and discuss the information in the BID, to elicit information from local sources, and to register I&APs. Comment forms provide a further way by which comments may be submitted. In the latter stages meetings provide opportunities to discuss the draft version of the Scoping Report before it is submitted to the competent environmental authority.

### **A1.6. Identification of alternatives**

Possible alternatives to the proposed development must be identified during the Scoping Phase. These may include fundamental alternatives, such as maintaining the current land use, or proposing a development of a different nature to the one proposed by the project proponent. Design alternatives are intended to modify certain design aspects of the proposed project, such as alternative technologies, timing of activities, or the location of infrastructure, so as to minimise negative impacts on the environment. The identification of alternatives must be reasonable and practical.



### A1.7. Plan of Study for the EIA Phase

The information and comments received and recorded during the Scoping Phase inform the larger and more comprehensive EIA Phase. This is usually achieved by the development of the Plan of Study (PoS) for the EIA. The PoS defines the actions, steps, and studies that must be undertaken in the EIA Phase.

### A1.8. Scoping Reports

The data collected during the baseline data collection and public participation processes must be synthesised in a Scoping Report. In line with NEMA regulations, registered I&APs are entitled to comment, in writing, on all written submissions made to the competent authority by the applicant or the EAP managing an application. Accordingly a Draft Scoping Report is made available for public comment for a minimum period of 30 days. All comments on the draft report must be considered, and necessary changes made to the Draft before it is submitted for review to the competent authority as the final Scoping Report. This report includes the PoS discussed in A1.7 above.

## A2. ENVIRONMENTAL IMPACT ASSESSMENT PHASE

In terms of section 31 (2) of the EIA regulations (2010), an *environmental impact assessment report must include:-*

*(h) An indication of the methodology used in determining the significance of potential environmental impacts.*

The Environmental Impact Assessment (EIA) is a comprehensive evaluation and study phase that addresses all the issues raised in the Scoping Phase. It is a substantial phase that has seven key objectives:-

- Describe the biophysical and socio-economic environment that is likely to be affected by the proposed development.
- Undertake specialist studies to address the key biophysical and socio-economic issues.
- Assess the significance of impacts that may occur from the proposed development.
- Assess the alternatives proposed during the Scoping Phase.
- Provide details of mitigation measures and management recommendations to reduce the significance of impacts.
- Provide a framework for the development of Environmental Management Plans.
- Continue with the public participation process.

### A2.1. Specialist Studies

Specialist studies are undertaken to provide a detailed and thorough examination of key issues and environmental impacts. Specialists gather relevant data to identify and assess environmental impacts that might occur on the specific component of the environment that they are studying (for instance waste management, air quality, noise, vegetation, water quality, pollution, waste management). Once completed, these studies are synthesised in, and presented in full as appendices to the Environmental Impact Report (EIR).

Based largely on the issues raised during the scoping phase (refer to *Volume 1: Final Environmental Scoping Report: Proposed Plan 8 Grahamstown Wind Energy Project*, CES, January 2012) as well as legislation relevant/applicable to the proposed project (refer to Chapter 3 of *Volume 1: Final Environmental Scoping Report: Proposed Plan 8 Grahamstown Wind Energy Project*, CES, January 2012), a series of specialist studies were conducted during the EIA the results of which are summarised in this EIR.

The team of specialists that conducted the required studies are recognised in their respective fields and have been utilised by CES for numerous wind farm EIA processes to date. Specialists were required to address the issues raised by I&APs during the Scoping phase in their reports by gathering baseline information and identifying the possible impacts related to the proposed project. Mitigation measures for impacts were also provided.

The detailed specialist studies have been compiled into a separate Specialist Studies Volume (*Volume 2: Proposed Plan 8 Grahamstown Wind Energy Project: Specialist Reports*) for the proposed project. The details and expertise of each of the specialists as well as signed declarations of their independence are also included in the Specialist Studies Volume and are therefore not repeated here.

The Terms of Reference (ToR) for each of the specialist studies were defined in the Final Scoping Report (*Volume 1: Proposed Plan 8 Grahamstown Wind Energy Project: Final Scoping Report - CES, January 2012*).

Although the specialists were given free rein on how they conducted their research and obtained their information, they were required to provide the reports in a specific layout and structure, so that a uniform report could be produced.

In addition to the above, in order to ensure that a direct comparison could be made between the various specialist studies, a set methodology was used by all the specialists when evaluating the significance of impacts. This methodology is discussed in detail in this appendix.

## **A2.2. Public Participation Process**

The public participation process (PPP) initiated at the beginning of the Scoping Phase continues into the EIA Phase. Once again the PPP provides a platform from which all I&APs are able to voice their concerns and raise issues regarding the project.

## **A2.3. Assessment of the Significance of Impacts**

It is necessary to determine the significance, or seriousness, of any impacts on the natural or social environment. It is common practice in the EIA Phase to use a significance rating scale that determines the spatial and temporal extent, and the severity and certainty of any impact occurring, including impacts relating to any project alternatives. This allows the overall significance of an impact or benefit to be determined.

The overall intent of undertaking a significance assessment is to provide the competent authority with information on the potential environmental impacts and benefits, thus allowing them to make an informed, balanced and fair decision.

## **A2.4. Mitigation Measures and Recommendations**

Critical to any EIA is the recommendation of practical and reasonable mitigation measures and recommendations. These recommendations relate to the actions that are needed in order to avoid, minimise or offset any negative impacts from the development.

## **A3.5. Planning Input**

An effective EIA process should actively engage and contribute to the project planning process so as to mitigate environmental impacts through improved design and layout.

### **A3.6. Environmental Impact Report**

The above-mentioned tasks are synthesised in an Environmental Impact Report (EIR). This will allow the assessment of the relationship of environmental impacts to project actions, as well as to assess the overall significance of these impacts. The EIR will also provide sufficient information to allow the competent authority to make an informed decision.

A summary report covering key findings is prepared in a manner that is easy to read and understand. Text will be kept short and technical detail to a minimum, while information will be presented in the form of photographs and figures wherever possible.

### **A4. ENVIRONMENTAL MANAGEMENT PLANS**

Environmental management and action plans based on the findings and recommendations set out in the EIR are prepared. Environmental Management Plans (EMPs) and, where necessary, Social Management Plans (SMPs) consist of a set of practical and actionable mitigation, monitoring and institutional measures to be taken into account during construction and operation of the proposed development. The aim is to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. These plans include: -

- The standards and guidelines that must be achieved in terms of environmental legislation.
- Mitigation measures and environmental specifications that must be implemented at 'ground level', that is, during construction and operation.
- Provide guidance through method statements to achieve the environmental specifications.
- Define corrective action that must be taken in the event of non-compliance with the specifications of the EMPs and SMPs.
- Prevent long-term or permanent environmental degradation.

### **A5. ENVIRONMENTAL AUTHORISATION AND APPEALS PROCESS**

On thorough examination of the EIR, the competent authority will issue an Environmental Authorisation or reject the application. Should authorisation be granted, it will carry Conditions of Approval. The proponent is obliged to adhere to these conditions.

I&APs are notified of the decision and have 10 days in which to lodge a notice of intention to appeal the decision, and a further 30 days in which to submit the appeal.

### **A6. ASSESSMENT METHODOLOGY**

#### ***Evaluating the significance of impacts***

To ensure a direct comparison between various specialist studies, a standard rating scale has been defined and will be used to assess and quantify the identified impacts. This is necessary since impacts have a number of parameters that need to be assessed.

Five factors need to be considered when assessing the significance of impacts, namely:

- 1. Relationship of the impact to temporal scales** - the temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.
- 2. Relationship of the impact to spatial scales** - the spatial scale defines the physical extent of the impact.

3. **The severity of the impact- the severity/beneficial scale** is used in order to scientifically evaluate how severe negative impacts would be, or how beneficial positive impacts would be on a particular affected system (for ecological impacts) or a particular affected party. The severity of impacts can be evaluated with and without mitigation in order to demonstrate how serious the impact is when nothing is done about it. The word 'mitigation' means not just 'compensation', but also the ideas of containment and remedy. For beneficial impacts, optimization means anything that can enhance the benefits. However, mitigation or optimization must be practical, technically feasible and economically viable.
4. **The likelihood of the impact occurring** - the likelihood of impacts taking place as a result of project actions differs between potential impacts. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident), and may or may not result from the proposed development. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.

Each criterion is ranked with scores assigned as presented in Table 7-1 to determine the overall **significance** of an activity. The criterion is then considered in two categories, viz. effect of the activity and the likelihood of the impact. The total scores recorded for the effect and likelihood are then read off the matrix presented in Table 7-2, to determine the overall significance of the impact (Table 7-3). The overall significance is either negative or positive. The **environmental significance** scale is an attempt to evaluate the importance of a particular impact. This evaluation needs to be undertaken in the relevant context, as an impact can either be ecological or social, or both. The evaluation of the significance of an impact relies heavily on the values of the person making the judgment. For this reason, impacts of especially a social nature need to reflect the values of the affected society.

Negative impacts that are ranked as being of “**VERY HIGH**” and “**HIGH**” significance will be investigated further to determine how the impact can be minimised or what alternative activities or mitigation measures can be implemented. These impacts may also assist decision makers i.e. lots of **HIGH** negative impacts may bring about a negative decision.

For impacts identified as having a negative impact of “**MODERATE**” significance, it is standard practice to investigate alternate activities and/or mitigation measures. The most effective and practical mitigations measures will then be proposed.

For impacts ranked as “**LOW**” significance, no investigations or alternatives will be considered. Possible management measures will be investigated to ensure that the impacts remain of low significance.

The significance scale is an attempt to evaluate the importance of a particular impact. This evaluation needs to be undertaken in the relevant context, as an impact can either be ecological or social, or both. The evaluation of the significance of an impact relies heavily on the values of the person making the judgment. For this reason, impacts of a social nature need to reflect the values of the affected society.

### **Cumulative Impacts**

Cumulative Impacts affect the significance ranking of an impact because it considers the impact in terms of both on-site and off-site sources. For example, pollution making its way into a river from a development may be within acceptable national standards.

Activities in the surrounding area may also create pollution which does not exceed these standards. However, if both on-site and off-site activities take place simultaneously, the total pollution level at may exceed the standards. For this reason it is important to consider impacts in terms of their cumulative nature.

**Seasonality**

Although seasonality is not considered in the ranking of the significance, it may influence the evaluation during various times of year. As seasonality will only influence certain impacts, it will only be considered for these, with management measures being imposed accordingly (i.e. dust suppression measures being implemented during the dry season).

**Ranking of Evaluation Criteria**

<b>EFFECT</b>	<b>Temporal scale</b>		<b>Score</b>
	Short term	Less than 5 years	<b>1</b>
	Medium term	Between 5 and 20 years	<b>2</b>
	Long term	Between 20 and 40 years (a generation) and from a human perspective almost permanent.	<b>3</b>
	Permanent	Over 40 years and resulting in a permanent and lasting change that will always be there	<b>4</b>
	<b>Spatial Scale</b>		
	Localised	At localised scale and a few hectares in extent	<b>1</b>
	Study area	The proposed site and its immediate environs	<b>2</b>
	Regional	District and Provincial level	<b>3</b>
	National	Country	<b>3</b>
International	Internationally	<b>4</b>	
<b>LIKELIHOOD</b>	<b>Severity</b>		<b>Benefit</b>
	Slight / Slightly Beneficial	Slight impacts on the affected system(s) or party(ies)	Slightly beneficial to the affected system(s) or party(ies)
	Moderate / Moderately Beneficial	Moderate impacts on the affected system(s) or party(ies)	An impact of real benefit to the affected system(s) or party(ies)
	Severe / Beneficial	Severe impacts on the affected system(s) or party(ies)	A substantial benefit to the affected system(s) or party(ies)
	Very Severe / Very Beneficial	Very severe change to the affected system(s) or party(ies)	A very substantial benefit to the affected system(s) or party(ies)
<b>Likelihood</b>			
Unlikely	The likelihood of these impacts occurring is slight		<b>1</b>
May Occur	The likelihood of these impacts occurring is possible		<b>2</b>
Probable	The likelihood of these impacts occurring is probable		<b>3</b>
Definite	The likelihood is that this impact will definitely occur		<b>4</b>

*\* In certain cases it may not be possible to determine the severity of an impact thus it may be determined: Don't know/Can't know*

**Table 7-2: The matrix that will be used for the impacts and their likelihood of occurrence**

<b>Likelihood</b>		<b>Effect</b>													
		<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>
	<b>1</b>	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	<b>2</b>	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	<b>3</b>	6	7	8	9	10	11	12	13	14	15	16	17	18	19
<b>4</b>	7	8	9	10	11	12	13	14	15	16	17	18	19	20	



Table 7-3: Ranking matrix to provide an Environmental Significance

Environmental Significance		Positive	Negative
<b>LOW</b>	An acceptable impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent development.  These impacts will result in either positive or negative medium to short term effects on the social and/or natural environment	4-7	4-7
<b>MODERATE</b>	An important impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which, in conjunction with other impacts may prevent its implementation.  These impacts will usually result in either positive or negative medium to long term effect on the social and/or natural environment.	8-11	8-11
<b>HIGH</b>	A serious impact which, if not mitigated, may prevent the implementation of the project.  These impacts would be considered by society as constituting a major and usually long term change to the natural and/or social environment and result in severe negative or beneficial effects.	12-15	12-15
<b>VERY HIGH</b>	A very serious impact which may be sufficient by itself to prevent the implementation of the project.  The impact may result in permanent change. Very often these impacts are unmitigable and usually result in very severe effects or very beneficial effects.	16-20	16-20

**Example of an environmental significance statement**

**Impact 1: Impact of noise on human health**

*Cause and Comment*

The noise associated with Heavy Goods Vehicles (HGVs) has the potential to impact on human health. A recommendation for the movement of large vehicles at night may impact on the sleep patterns of local communities.

*Mitigation and Management*

There are standard mitigation measures to ensure that vehicle noise is kept within acceptable limits. Vehicles should be kept in good repair; they should use standard exhaust and silencing equipment. Drivers should stick to designated speed limits. Roads should be kept in good condition.

**Significance Statement**

RATING		Temporal Scale		Spatial Scale		Severity of Impact		Risk or Likelihood		Total
	Without Mitigation	Short term	1	Localised	1	Moderate	2	Definite	4	8
With Mitigation	Short term	1	Localised	1	Slight	1	Unlikely	1	4	
<b>Overall Significance without mitigation</b>									<b>MODERATE</b>	
<b>Overall Significance with mitigation</b>									<b>LOW-</b>	

## APPENDIX B: CORRESPONDENCE FROM AUTHORITIES AND KEY STAKEHOLDERS



### environmental affairs

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA

2012 -02- 20

Private Bag X 447 · PRETORIA · 0001 · Fedsure Building · 315 Pretorius Street · PRETORIA  
Tel (+ 27 12) 310 3911 · Fax (+ 2712) 322 2682

Reference: 12/12/20/2523

Enquiries: Takalani Maswime

Tel: 012 310 3780 Fax: 012 320 7539 E-mail: tmaswime@environment.gov.za

Bill Rowlston  
Coastal & Environmental Services  
PO Box 934  
GRAHAMSTOWN  
6139

Fax: 046 622 6564

PER FACSIMILE / MAIL

Dear Sir/Madam

#### ACKNOWLEDGEMENT OF RECEIPT OF FINAL SCOPING REPORT: PROPOSED DEVELOPMENT OF THE PLAN 8 GRAHAMSTOWN WIND ENERGY PROJECT, MAKANA MUNICIPALITY, EASTERN CAPE

The Department confirms having received the final Scoping Report dated January 2012 for the abovementioned project on 26 January 2012.

You are hereby reminded that the activity may not commence prior to an environmental authorisation being granted by the Department.

Yours sincerely

  
Mr Ishaam Abader

Deputy Director-General: Environmental Quality and Protection  
Department of Environmental Affairs

Letter signed by: Ms Mmallala Rabothata

Designation: PEO: Environmental Impact Evaluation

Date: 14/02/2012

2012-04-02



agriculture,  
forestry & fisheries

Department:  
Agriculture, forestry & fisheries  
REPUBLIC OF SOUTH AFRICA

Private Bag X120, Pretoria (Tlokweng), 0001  
Delpean Building, C/o Annie Botha & Union Street, Riviera, 0084

From: Directorate Land Use and Soil Management  
Tel: 012-319-7034 Fax: 012-329-5938 ThokoB@daff.gov.za  
Enquiries: Help Desk Ref: 2011\_10\_0126

Coastal & Environmental Services  
PO BOX 934  
GRAHAMSTOWN  
6139

2012-03-26

Dear Sir/Madam

**ENVIRONMENTAL SCOPING ASSESSMENT (EIA) FOR WIND FARMS  
PROPOSED BY PLAN 8 (PTY) LTD INFINITE ENERGY NEAR  
GRAHAMSTOWN., EASTERN CAPE PROVINCE**

Your application letter dated 30 January 2012 refers.

With reference to the above-mentioned matter, this Department does not support the development. This application can be considered on receipts of footprints.

Yours faithfully

**DELEGATE OF THE MINISTER: LAND USE AND SOIL MANAGEMENT**

LESLBY 2012/ PLAN 8



**energy**

Department:  
Energy  
REPUBLIC OF SOUTH AFRICA

Private Bag X 59, PRETORIA 0001  
Pretoria, Tel: 012 444 4147/4261

Fax: 012 444 4501

Mr. Anton Hough  
Coastal and Environmental Services  
PO Box 934  
Grahamstown  
6139

**Fax: 046 622 6564**

Dear Mr. Hough,

**DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME AND SPECIALIST  
REPORTS IN RESPECT OF THE PROPOSED GRAHAMSTOWN WIND ENERGY  
PROJECT**

Your correspondence dated 26 April 2012 and 7 May 2012 has reference.

The Department of Energy has studied the Draft Environmental Impact Assessment Reports and the Draft Environmental Management Programme and associated specialist reports on the proposed Grahamstown Wind Energy Project.

We hereby inform the Coastal and Environmental Services that we are satisfied with the report. We appreciate your endeavor to comply with prescribed legislation and thank you for your initiative to contribute to the development of the renewable energy sector in SouthAfrica.

We wish you all the best in securing a Positive Record of Decision from the Department of Environmental Affairs.

The Department would appreciate being kept informed of progress with this project.

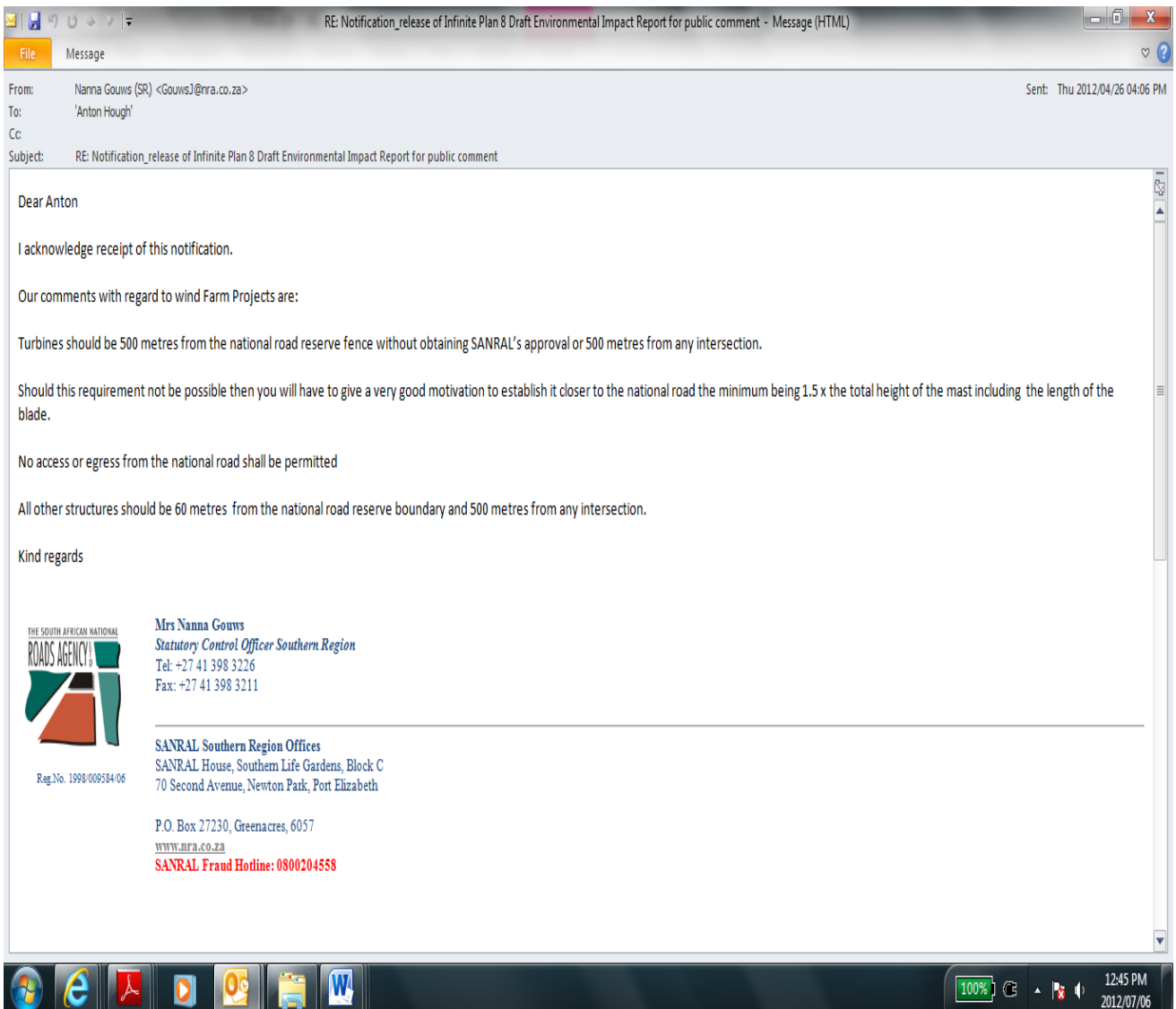
**Yours truly**



**Ms. M Modise**

**Chief Director: Clean Energy** (Activities)

**Date:** 06/04/2012





**From:** Riana Meiring [mailto:RianaMeiring@makana.gov.za]  
**Sent:** 25 July 2012 10:13 AM  
**To:** Jadon Schmidt  
**Subject:** RE: Plan8 Grahamstown Wind Energy Project

Dear Jadon

My comment as promised. The Directorate: LED supports any programme that contributes to a green economy, provided that the beneficiaries in the area benefit from local economic development programmes that emanates from the development. It is crucial that all land use management procedures and applications are followed and obtained. Projects promoting the green economy is supported on condition that the negative impact to the environment is considered and minimised and that the EIA results in a positive ROD.

Regards

Riana Meiring  
Director: Local Economic Development  
Makana Local Municipality  
City Hall, Church Square, Grahamstown, 6139  
P O BOX 176, GRAHAMSTOWN, 6140  
Tel: +27 46 6036116  
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Cell no +27 834481055



Plan8 Wind Energy Facility  
Our Ref: 9/2/003/0002



Enquiries: Mariagrazia Galimberti  
Tel: 021 462 4502  
Email: mgalimberti@sahra.org.za  
CaseID: 266

Date: Friday July 27, 2012

Page No: 1

## Final Comment

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

Attention:  
Mr Anton Hough  
Coastal and Environmental Services  
P.O. Box 934  
Grahamstown  
6140

#### PROPOSED DEVELOPMENT OF THE PLAN8 GRAHAMSTOWN WIND ENERGY PROJECT

*Gess, R., December 2011. Proposed Infinite Plan 8 Grahamstown Wind Farm, Eastern Cape Province of South Africa.*

*Nilssen, P., December 2011. Proposed development of the Plan 8 Grahamstown Wind Energy Project: including Farms Gilead 361, Penynes Kraal 362 and Tower Hill 363, Grahamstown, Makana Municipality, Eastern Cape Province.*

Plan8 Infinite Energy is proposing the establishment of a wind energy facility about 30 km east of Grahamstown, in the Makana Municipality.

A Scoping Report was submitted to SAHRA in January including an archaeological and a palaeontological impact assessment. No further studies were undertaken for the Environmental Impact Report.

The wind energy facility is proposed to have a generation capacity up to 67.5MW, with a maximum of 27 wind turbines distributed over about 2500ha. The entire area is characterised by undulate slopes and ridges, which are the preferred location for wind turbines.

The archaeologist warns that he was not able to survey the complete footprint of the development because of dense vegetation cover, however, after his survey he is confident that the general sensitivity of the area is low from an archaeological perspective. On the surveyed properties the specialist recorded a few *ex situ* Stone Age artefacts of low archaeological significance, two unmarked graves older than 80 years and an old and rusted horse/oxen drawn plough on Farm Gilead 361 and a cave with rock paintings on Peynes Kraal 362, known to the owner of the property.

The exact position of two wind turbines was changed between the scoping phase and the impact assessment phase, and therefore their footprint was not assessed. However, as mentioned above, the lack of significant material in proximity of these two turbines, and more in general in the entire surveyed area, does not warrant for a further assessments of the site.

Geologically the area is located 30km from Waterloo Farm, the black shale of which is considered as the most important Late Devonian palaeontological site in Africa. However, after the survey the palaeontologist concluded that the fossil significance of the footprint area of the wind energy facility is quite low, since the



The South African Heritage Resources Agency

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Plan8 Wind Energy Facility  
Our Ref: 9/2/003/0002



Enquiries: Mariagrazia Galimberti  
Tel: 021 462 4502  
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CaseID: 266

Date: Friday July 27, 2012

Page No: 2

black shale of the Witpoort Formation deeply weathered here during the Tertiary and degraded into kaolin soft clay, which is currently exploited for mining along with silcrete.

The central part of the area is formed by quartzitic hills also derived from the degradation of the Witpoort Formation quartzite strata and here shallow-water ripples surfaces and ropy horizontal trace fossils were recorded; their significance is considered to be too low to engage into mitigation of the site.

The Witpoort Formation is in places overlain by fine grained brown shales of the Lake Mentz Subgroup, where only a few plant fragment fossils considered also to be of low significance were recorded.

**Decision:**

After considering the two impact assessments and the Environmental Impact Report SAHRA requires that:

- The two unmarked graves must be clearly demarcated and fenced off at least temporarily during construction. A fence must be placed around them, at least 5m from the perimeter of the graves.
- A buffer zone of 50m should be respected between the fence around the graves and the closest wind turbines, this buffer area may be reduced to 20m in the case of access roads.
- The old plough may be fenced off with the graves, however its exposure to the elements will undoubtedly continue its degradation. It is suggested that, if possible and if the landowner deems it suitable, the plough be moved under a covered area or indoor.
- While the rock art site is located in a gorge, and therefore not easily accessible from the ridges where the turbines will be located, it is recommended that the work force at the wind energy facility understands both the importance of the site from an archaeological perspective and why it should not be damaged.

If these recommendations are adhered to, the SAHRA Archaeology, Palaeontology and Meteorites Unit has no objections to the development. If any new evidence of archaeological sites or artefacts, palaeontological fossils, graves or other heritage resources are found during construction, SAHRA (Mariagrazia Galimberti/Colette Scheermeyer, Tel: 021 462 4502) and a professional archaeologist or palaeontologist, depending on the nature of the 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

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The South African Heritage Resources Agency

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Plan8 Wind Energy Facility  
Our Ref: 9/2/003/0002



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CaseID: 266

Date: Friday July 27, 2012

Page No: 3

Mariagrazia Galimberti  
Heritage Officer: Archaeology  
South African Heritage Resources Agency

Colette Scheermeyer  
SAHRA Head Archaeologist  
South African Heritage Resources Agency

**ADMIN:**  
(DEA, Ref: 12/12/20/2523 )

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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\* Tel: +27 21 462 4502 \* Fax: +27 21 462 4509 \* Web: <http://www.sahra.org.za>

## APPENDIX C: PLAN OF STUDY SUBMITTED TO DEA

According to regulation 28 (1) (i) of the EIA regulations (2010), *A scoping report must include –*

- (n) *a plan of study for environmental impact assessment which sets out the proposed approach to the environmental impact assessment of the application, which must include –*
- (i) *a description of the tasks that will be undertaken as part of the environmental impact assessment process, including any specialist reports or specialised processes, and the manner in which such tasks will be undertaken;*
  - (ii) *an indication of the stages at which the competent authority will be consulted;*
  - (iii) *a description of the proposed method of assessing the environmental issues and alternatives, including the option of not proceeding with the activity; and*
  - (iv) *particulars of the public participation process that will be conducted during the environmental impact assessment process; and*
- (o) *any specific information required by the competent authority.*

In line with the above-mentioned legislative requirement, this Chapter therefore sets out the Plan of Study (PoS) for the EIA phase of the assessment. **Consultation with DEA will be on-going throughout this EIA. However, it is anticipated that DEA will provide relevant comment with respect to the adequacy of this Plan of Study for the EIA, as it informs the content of the EIR and sufficiency thereof.**

### EIA PHASE

The EIA phase has four key elements, namely:-

- **Specialist Studies:** Specialist studies identified as being necessary during the Scoping Phase, plus any additional studies that may be required by the authorities, will be undertaken during the initial phase of the EIA. Appropriately qualified and experienced specialists will be appointed to undertake the various assessments. Specialists will gather baseline information relevant to the study being undertaken and will assess impacts associated with the development. Specialists will also make recommendations to mitigate negative impacts and enhance benefits. The resulting information will be synthesised into the Environmental Impact Report (EIR), whilst the full specialist reports will be attached to the EIR as a Specialist Volume.
- **Environmental Impact Report (EIR):** The main purpose of this report is to gather and synthesise environmental information and evaluate the overall environmental impacts associated with the development, to consider mitigation measures and alternative options, and make recommendations in choosing the best development alternative. The EIR also identifies mitigation measures and management recommendations to minimise negative impacts and enhance benefits. The EIR and associated specialist reports are made available for public and authority review and comment. The availability of the report will be advertised in one Provincial and one local newspaper and the report will also be made available for public scrutiny in easily accessible locations.
- **Comments Report:** The comments report provides a detailed record of comments, issues and concerns raised by I&APs and the authorities during the review period, and also provides relevant responses to these comments.
- **Environmental Management Programme (EMPr):** The EMPr provides guidelines to the project proponent and the technical team on how best to implement the mitigation measures and management recommendations outlined in the EIR during the construction and operational phase.

In addition to the above, the **Public Participation Process** commenced during the Scoping Phase is continued, during which I&APs are afforded further opportunities to raise their issues, concerns and comments regarding the proposed project. It is possible that some of the project details may



have changed in response to the preliminary findings of the ESR, and as a result of design changes made by the project proponent. I&APs and key stakeholders are given the opportunity to review the Draft EIR before it is submitted to the authorities for consideration. Comments on the Draft EIR received from I&APs are included and addressed in the submitted EIR.

### ***Specialist studies***

The following Specialist Studies are proposed for the EIA Phase of the assessment:

- Visual Impact Assessment
- Noise Impact Assessment
- Ecological Impact Assessment (incorporating flora and fauna)
- Avifauna Impact Assessment
- Archaeological and Palaeontological Impact Assessment
- Bat (*Chiroptera*) Impact Assessment
- Agricultural Impact Assessment

The proposed Terms of Reference for the above studies, which outline the information required from the specialists, are provided in Sections 8.1.1.1 – 8.1.1.5 below and the methodology for assessing the significance of impacts and alternatives is described in Section 8.1.2 that follows. Specialists will also be required to address issues raised by I&APs in their reports.

### ***Visual and Landscape Impact Assessment***

The size of the structures is dictated by the design, and there is little that can be done to reduce their dimensions. Therefore, the Visual and Landscape Impact Assessment the details of which are provided below will focus on mitigation measures. The specific Terms of Reference for the Visual and Landscape Impact Assessment will therefore include:-

1. Conduct a site reconnaissance visit and photographic survey of the proposed project site.
2. Conduct a desk top mapping exercise to establish visual sensitivity:-
  - Describe and rate the scenic character and sense of place of the area and site.
  - Establish extent of visibility by mapping the view-sheds and zones of visual influence
  - Establish visual exposure to viewpoints
  - Establish the inherent visual sensitivity of the site by mapping slope grades, landforms, vegetation, special features and land use and overlaying all relevant above map layers to assimilate a visual sensitivity map.
3. Review relevant legislation, policies, guidelines and standards.
4. Preparation of a draft Visual Baseline/Sensitivity report
  - Assessing visual sensitivity criteria such as extent of visibility, the sites inherent sensitivity, visual sensitivity of the receptor's, visual absorption capacity of the area and visual intrusion on the character of the area
  - Prepare photomontages of the proposed development
  - Conduct shadow flickering modelling
  - Assess the proposed project against the visual impact criteria (visibility, visual exposure, sensitivity of site and receptor, visual absorption capacity and visual intrusion) for the site.
  - Assess impacts based on a synthesis of criteria for each site (criteria = nature of impact, extent, duration, intensity, probability and significance)
  - Establish mitigation measures/recommendations with regards to minimizing visual risk areas

### ***Noise Impact Assessment***

The objectives of the noise impact assessment will be to:

1. Identify all potential noise sensitive sites that could be impacted upon by activities relating to the construction and operation of the proposed wind energy facility.

2. Identify all noise sources relating to the activities of the facility during the construction and operation phases that could potentially result in a noise impact at the identified noise sensitive sites.
3. Determine the sound emission, operating cycle and nature of the sound emission from each of the identified noise sources.
4. Calculate the combined sound power level due to the sound emissions of the individual noise sources.
5. Calculate the expected rating level of sound at the identified noise sensitive sites from the combined sound power level emanating from identified noise sources.
6. Display the rating level of sound emitted by the noise sources in the form of noise contours superimposed on the map of the study area.
7. Determine the existing ambient levels of noise at identified noise sensitive sites by conducting representative sound measurements.
8. Determine the acceptable rating level for noise at the identified noise sensitive sites.
9. Calculate the noise impact at identified noise sensitive sites.
10. Assess the noise impact at identified noise sensitive sites in terms of:-
  - SANS 101 SANS 10103 for “The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication”.
  - Noise Control Regulations.
  - World Health Organisation - Guidelines for Community Noise.
  - World Bank - Environmental Guidelines.
11. Investigate alternative noise mitigation procedures, if required, in collaboration with the design engineers of the facility and estimate the impact of noise upon implementation of such procedures.
12. Prepare and submit a full environmental noise impact report containing detailed procedures and findings of the investigation including recommended noise mitigation procedures, if relevant.

### *Ecological Impact Assessment*

The assessment will follow on from the initial study, which included a site visit (see Chapter 4 above) conducted during the scoping phase, and will address any key issues raised by interested and affected parties. A considerable body of information on the flora and fauna of the Makana area and its environs has been assembled in the reports on previous studies of the area in general. Accordingly the study will comprise a desktop study of all available relevant literature.

However, a detailed survey of the site will be undertaken to determine the possibility of there being listed threatened or protected ecosystems and species on the proposed project site. If any of these are found, the Environmental Management Plan will include recommended measures to remove or otherwise protect plant species found on the site that are afforded protection under the National Environmental Management: Biodiversity Act during construction.

This specialist study will therefore include but will not be limited to –

1. A detailed description of the ecological (fauna and flora) environment within and immediately surrounding the footprint of the proposed development and will consider terrestrial fauna and flora. Fauna include mammals, reptiles, amphibians, and insects but not avifauna as these will be the subject of a separate specialist study (refer to Section 8.1.1.5 below). This aspect of the report will specifically include the identification of -
  - Areas of high biodiversity;
  - The presence of species of special concern, including sensitive, endemic and protected species;
  - Habitat associations and conservation status of the identified fauna and flora;
  - The presence of areas sensitive to invasion by alien species; and
  - The presence of conservation areas and sensitive habitats where disturbance should be avoided or minimised.
2. Review relevant legislation, policies, guidelines and standards.

3. An assessment of the potential direct and indirect impacts resulting from the proposed development (including the wind turbines, associated infrastructure e.g. access road), both on the footprint and the immediate surrounding area during construction and operation;
4. A detailed description of appropriate mitigation measures that can be adopted to reduce negative impacts for each phase of the project, where required; and
5. Checklists of faunal groups identified in the region to date, highlighting sensitive species and their possible areas of distribution.

### *Avifauna Assessment*

An avifauna specialist study will be conducted. The assessment will include:

4. A desk-top review of existing literature to seek:
  - Previous means of predicting bird mortality (and other impacts) of wind turbines affecting birds in groups similar to those in the study area.
  - Accounts of mortality at wind turbines
  - Information on the status, in Makana Municipality, Eastern Cape, South Africa and globally, of bird groups most likely to be affected
5. A site visit to identify species of special concern and assess the likely impacts of the construction and operational phases on the avifauna of the site.
  - Surveys will be conducted on at least two days at sites at either end, and in the middle of the proposed turbine corridor and, as a control against the post construction situation, one-day surveys at two similar sites outside the turbine affected area. Survey sites will be selected to reflect variation in local habitat and terrain.
  - At each site, a camp will be established in the early afternoon. Two hours of observations will be undertaken before dusk and two during the first hours of darkness (when night-migrating birds are likely to be flying at lower altitude). Observations will begin again at first light and continue for 3-4 hours (depending on bird activity levels and especially the use of thermals by soaring birds).
  - During daylight in each survey hour - 2 x 15 minutes for visual scans of birds crossing the proposed turbine corridor (with appraisal of flight height above the ground) - 2 x 10 minutes circular point surveys
  - After dark in each hour scans by night vision binoculars - 2 x 10 minutes focused on bird activity
6. Conduct a review of international literature and experience relating to operational wind farms; including state of the art plants around the world
7. Contextualize the literature and experience and relate it to the Eastern Cape scenario and local avifauna;
8. Map sensitive areas in and around the proposed project site(s);
9. Describe the affected environment and determine the status quo in terms of avifauna;
10. Indicate how an avifaunal resource or community will be affected by the proposed project;
11. Discuss gaps in the baseline data with respect to avifauna and relevant habitats;
12. List and describe the expected impacts;
13. Assess and evaluate the anticipated impacts, and;
14. Make recommendations for relevant mitigation measures which will allow the reduction of negative impacts and the maximization of the benefits associated with any identified positive impacts.

Although the avifauna specialist will assess avian collision risk and provide detailed explanations and ratings of the likelihood of collisions of various species, *detailed avian collision modelling* i.e. quantitatively assessing the collision risk potential (i.e. birds directly colliding with rotor blades and turbine towers) of the proposed wind farm cannot be undertaken. This is because the extent to which this can formally be modelled and quantified to arrive at predicted numbers of collisions, would depend largely on the primary data collection related to flight frequencies and species, but it is unlikely that even the best possible data collection between now and mid 2010 would provide much confidence in such a model, as it would require more representative data collection across a range of conditions/seasons etc. In addition, very often the worst bird collision 'events' at wind

farms around the world have been found to have occurred in extreme weather conditions, when flight behaviour etc is abnormal.

### *Archaeological and Palaeontological Impact Assessment*

As part of the Environmental Impact Assessment (EIA) for the proposed facility, it is necessary to undertake a phase one archaeological and historical survey to fulfil SAHRA requirements in accordance with the requirements of the National Heritage Resources Act (Act No 25 of 1999) which requires that "...any development or other activity which will change the character of a site exceeding 5 000m<sup>2</sup>, or the rezoning or change of land use of a site exceeding 10 000 m<sup>2</sup>, requires an archaeological impact assessment".

A heritage and archaeological impact assessment will therefore be conducted, the primary objective of which is to determine whether there are any indications that the proposed site is of archaeological significance. This will be a phase 1 assessment and will be largely desk-top although a site visit will be required to enable the specialist the opportunity to look for significant artefacts on the surface of the site. It is not expected that a more detailed Phase 2 assessment will be required but this remains to be confirmed.

The terms of reference for the Phase 1 archaeological study will be to:

1. Determine the likelihood of heritage or archaeological remains of significance on the proposed site within the Makana area;
2. Identify and map (where applicable) the location of any significant heritage or archaeological remains;
3. Assess the sensitivity and significance of heritage and archaeological remains in the site; and
4. Identify mitigatory measures to protect and maintain any valuable heritage archaeological sites and remains that may exist within the proposed site.

A palaeontological impact assessment will therefore be conducted, the primary objective of which is to determine whether there are any indications that the proposed site is of palaeontological significance. This will be a phase 1 assessment and will be largely desk-top although a site visit will be required to enable the specialist the opportunity to look for significant artefacts/fossils on the surface of the site. It is not expected that a more detailed Phase 2 assessment will be required but this remains to be confirmed.

The terms of reference for the Phase 1 palaeontological study will be to:

- Provide a summary of the relevant legislation;
- Conduct a site inspection as required by national legislation
- Determine the likelihood of palaeontological remains of significance in the proposed site;
- Identify and map (where applicable) the location of any significant palaeontological remains;
- Assess the sensitivity and significance of palaeontological remains in the site;
- Assess the significance of direct and cumulative impacts of the proposed development and viable alternatives on palaeontological resources;
- Identify mitigatory measures to protect and maintain any valuable palaeontological sites and remains that may exist within the proposed site.
- Prepare and submit any permit applications to relative authorities

### *Bat (Chiroptera) Impact Assessment*

A bat (*Chiroptera*)faunal specialist study will be conducted. The assessment will include:

- A desk-top review of existing literature.
- A site visit to identify species of special concern and assess the likely impacts of the construction and operational phases on the *Chiroptera* of the site.

- Conduct a review of international literature and experience relating to operational wind farms; including state of the art plants around the world
- Map sensitive areas in and around the proposed project site(s);
- Describe the affected environment and determine the status quo in terms of bat (*Chiroptera*) fauna;
- Indicate how bat faunal resource or community will be affected by the proposed project;
- Discuss gaps in the baseline data with respect to bat fauna and relevant habitats;
- List and describe the expected impacts;
  - Assess the significance of direct and cumulative impacts (including foraging impacts, roost impacts and migratory impacts) of the proposed development and viable alternatives with regard to bat fauna;
- Assess and evaluate the anticipated impacts, and;
- Make recommendations for relevant mitigation measures which will allow the reduction of negative impacts and the maximization of the benefits associated with any identified positive impacts.





## environmental affairs

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Environmental Affairs  
REPUBLIC OF SOUTH AFRICA

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DEA Reference: 12/12/20/2523

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Mr. Hylton Newcombe  
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6140

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### PER FACSIMILE / MAIL

Dear Mr. Newcombe

#### APPLICATION FOR ENVIRONMENTAL AUTHORISATION: PROPOSED PLAN 8 GRAHAMSTOWN WIND ENERGY PROJECT WITHIN THE MAKANA LOCAL MUNICIPALITY, EASTERN CAPE PROVINCE

1. The Final Scoping Report (FSR) and Plan of Study for Environmental Impact Assessment (PoSEIA) dated January 2012 and received by the Department on 26 January 2012 refers.
2. The Department has evaluated the submitted FSR and the PoSEIA dated January 2012 and is satisfied that the documents comply with the minimum requirements of the Environmental Impact Assessment (EIA) Regulations, 2010. The FSR is hereby accepted by the Department in terms of regulation 30(1)(a) of the EIA Regulations, 2010.
3. You may proceed with the environmental impact assessment process in accordance with the tasks contemplated in the Plan of Study for Environmental Impact Assessment as required in terms of the EIA Regulations, 2010. All comments and recommendations made by all stakeholders and Interested and Affected Parties (I&APs) in the Draft Scoping Report and submitted as part of the FSR must be taken into consideration when preparing an environmental impact assessment report in respect of the proposed development.
4. Please ensure that comments from all relevant stakeholders are submitted to the Department with the Final Environmental Impact Report (EIR). This includes but is not limited to the Eastern Cape Provincial Department of Economic Development, Environment and Tourism, the South Africa Heritage Resource Agency (SAHRA), the Department of Agriculture and Land Use Management, the Department of Agriculture Forestry and Fisheries (DAFF), the Department of Water Affairs (DWA), the Civil Aviation Authority (CAA), the Department of Energy, Wildlife and Environmental Society of Southern Africa (WESSA), the EC Department of Transport, the South African National Roads

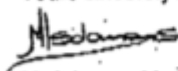
Agency Limited (SANRAL), Eskom Holdings SOC Limited, the Makana Local Municipality and other stakeholders. Proof of correspondence with the various stakeholders must be included in the Draft and Final EIR. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments.

5. Please ensure that the Final EIR includes at least one A3 regional map of the area and the site layout plan to illustrate the turbines positions and associated infrastructure. The maps must be of acceptable quality and as a minimum, have the following attributes:
  - Maps are relatable to one another;
  - Cardinal points;
  - Co-ordinates;
  - Legible legends;
  - Indicate alternatives;
  - Latest land cover;
  - Vegetation types of the study area; and
  - A3 size locality map.
  
6. In addition, the following amendments and additional information are required for the EIR:
  - Details of the future plans for the site and infrastructure after decommissioning in 20-30 years and the possibility of upgrading the proposed infrastructure to more advanced technologies.
  - Should a Water Use License be required, proof of application for a license needs to be submitted.
  - Information on services required on the site, e.g. sewage, refuse removal, water and electricity. Who will supply these services and has an agreement and confirmation of capacity been obtained? Proof of these agreements must be provided.
  - In addition the specialist studies identified in the Plan of Study for Environmental Impact Assessment, conduct Geotechnical Study, Wetland delineation studies (should the proposed development affect any wetland/s in the immediate vicinity) and a technical analysis and input of shadow and flicker affects.
  
7. A copy of the final site layout plan. EIR. All available biodiversity information must be used in the finalisation of the layout plan. Existing infrastructure must be used as far as possible e.g. roads. The layout plan must indicate the following:
  - Position of the turbines and its associated infrastructure;
  - Foundation footprint;
  - Permanent laydown area footprint;
  - Construction period laydown footprint;
  - Internal roads indicating width (construction period width and operation period width) and with numbered sections between the other site elements which they serve (to make commenting on sections possible);
  - Wetlands, drainage lines, rivers, stream and water crossing of roads and cables indicating the type of bridging structures that will be used;
  - Heritage sites that will be affected by the facility and associated infrastructure;
  - Sub-station(s) and/or transformer(s) sites including their entire footprint;
  - Cable routes and trench dimensions (where they are not along internal roads);
  - Connection routes (including pylon positions) to the distribution/transmission network;
  - Cut and fill areas at panel sites, along roads and at sub-station/transformer sites indicating the expected volume of each cut and fill;
  - Borrow pits;
  - Spoil heaps (temporary for topsoil and subsoil and permanently for excess material);

- All existing infrastructure on the site, especially roads;
  - Environmental sensitive features and buffer areas.
  - Buildings, including accommodation; and
  - All "no-go" areas.
8. An environmental sensitivity map indicating environmental sensitive areas and features identified during the EIA process.
9. A map combining the final layout plan superimposed (overlain) on the environmental sensitivity map.
10. The Environmental Management Programme (EMPr) to be submitted as part of the EIR must include the following:
- All recommendations and mitigation measures to be recorded in the Final EIR.
  - The final site layout plan.
  - Measures as dictated by the final site lay-out plan and micro-siting.
  - A plant rescue and protection plan which allows for the maximum transplant of conservation important species from areas to be transformed. This plan must be compiled by a vegetation specialist familiar with the site and be implemented prior to commencement of the construction phase.
  - An open space management plan to be implemented during the construction and operation of the facility.
  - A re-vegetation and habitat rehabilitation plan to be implemented during the construction and operation of the facility including timeframes for restoration which must indicate rehabilitation within the shortest possible time after completion of construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.
  - An alien invasive management plan to be implemented during construction and operation of the facility. The plan must include mitigation measures to reduce the invasion of alien species and ensure that the continuous monitoring and removal of alien species is undertaken.
  - A storm water management plan to be implemented during the construction and operation of the facility. The plan must ensure compliance with applicable regulations and prevent off-site migration of contaminated storm water or increased soil erosion. The plan must include the construction of appropriate design measures that allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows. Drainage measures must promote the dissipation of storm water run-off.
  - An effective monitoring system to detect any leakage or spillage of all hazardous substances during their transportation, handling, use and storage. This must include precautionary measures to limit the possibility of oil and other toxic liquids from entering the soil or storm water systems.
  - An erosion management plan for monitoring and rehabilitating erosion events associated with the facility. Appropriate erosion mitigation must form part of this plan to prevent and reduce the risk of any potential erosion.
  - A transportation plan for the transport of turbine components, main assembly cranes and other large pieces of equipment.
  - A traffic management plan for the site access roads to ensure that no hazards would result from the increased truck traffic and that traffic flow would not be adversely impacted. This plan must include measures to minimize impacts on local commuters e.g. limiting construction vehicles travelling on public roadways during the morning and late afternoon commute time and avoid using roads through densely populated built-up areas so as not to disturb existing retail and commercial operations.

- An avifauna and bat monitoring programme to document the effect of the operation of the energy facility on avifauna and bats. This must be compiled by a qualified specialist.
  - Measures to protect hydrological features such as streams, rivers, pans, wetlands, dams and their catchments, and other environmental sensitive areas from construction impacts including the direct or indirect spillage of pollutants.
11. Please be advised that not all the activities applied for in the Application Form received on 26 January 2012 are specific and applicable with reference to the project description in the Final Scoping Report received on 26 January 2012. You are thus requested to amend the application form such that:
    - Listing notice activities applied for are specific; and
    - Listing notice activity applied for can be linked to the development activity or infrastructure in the project description.
  12. The applicant is hereby reminded to comply with the requirements of regulation 67 with regard to the time period allowed for complying with the requirements of the Regulations, and regulations 56 and 57 with regard to the allowance of a comment period for interested and affected parties on all reports submitted to the competent authority for decision-making. The reports referred to are listed in regulation 56(3a-3h).
  13. Further, it must be reiterated that, should an application for Environmental Authorisation be subject to the provisions of Chapter II, Section 38 of the National Heritage Resources Act, Act 25 of 1999, then this Department will not be able to make nor issue a decision in terms of your application for Environmental Authorisation pending a letter from the pertinent heritage authority categorically stating that the application fulfils the requirements of the relevant heritage resources authority as described in Chapter II, Section 38(8) of the National Heritage Resources Act, Act 25 of 1999.
  14. You are requested to submit two electronic copies (CD/DVD and two (2) hard copies of the Environmental Impact Report (EIR) to the Department as per regulation 34(1)(b) of the EIA Regulations, 2010.
  15. Please also find attached information that must be used in the preparation of the Environmental impact Report. This will enable the Department to speedily review the EIAR and make a decision on the application.
  16. You are hereby reminded of Section 24F of the National Environmental Management Act, Act No 107 of 1998, as amended, that no activity may commence prior to an environmental authorisation being granted by the Department.

Yours sincerely



**Mr Ishaam Abader**  
 Deputy Director-General: Environmental Quality and Protection  
 Department of Environmental Affairs  
 Letter signed by: Ms Millicent Solomons  
 Designation: Acting Director: Environmental Impact Evaluation  
 Date: 24/02/2012

CC	Mr Z Jessa	Plan 8 (Pty) Ltd	Tel: 072-692-2786	Fax: Zuben.jessa@plan-8.co.za
	Mr. L Els	Eastern Cape DEDET	Tel: 014-508-5815	Fax: 041-585-1958
	Ms. N Baart	Makana Local Municipality	Tel: 046-603-6131	Email: Ntombi.baart@makana.gov.za

**A. EIA INFORMATION REQUIRED FOR WIND FARM APPLICATIONS**

**1. General site information**

The following general site information is required:

- Descriptions of all affected farm portions
- 21 digit Surveyor General codes of all affected farm portions
- Copies of deeds of all affected farm portions
- Photos of areas that give a visual perspective of all parts of the site
- Photographs from sensitive visual receptors (tourism routes, tourism facilities, etc.)
- Turbine design specifications including:
  - Nacelle height
  - Blade length
  - Turbine shaft dimensions
  - Foundation dimensions
  - Laydown area dimensions (construction period and thereafter)
  - Blade rotation direction
  - Generation capacity
- Onsite measured wind parameters (speed, variability, etc.)
- Generation capacity of the facility as a whole at delivery points

This information must be indicated on the first page of any Scoping or EIA document. It is also advised that it be double checked as there are too many mistakes in the applications that have been received that take too much time from authorities to correct.

**2. Site maps and GIS information**

Site maps and GIS information should include at least the following:

- All maps/information layers must also be provided in ESRI Shapefile format
- All affected farm portions must be indicated
- The exact site of the application must be indicated (the areas that will be occupied by the application)
- A status quo map/layer must be provided that includes the following:
  - Current use of land on the site including:
    - Buildings and other structures
    - Agricultural fields
    - Grazing areas
    - Natural vegetation areas (natural veld not cultivated for the preceding 10 years) with an indication of the vegetation quality as well as fine scale mapping in respect of Critical Biodiversity Areas and Ecological Support Areas
    - Critically endangered and endangered vegetation areas that occur on the site
    - Bare areas which may be susceptible to soil erosion
    - Cultural historical sites and elements
  - Rivers, streams and water courses
  - Ridgelines and 20m continuous contours with height references in the GIS database
  - Fountains, boreholes, dams (in-stream as well as off-stream) and reservoirs
  - High potential agricultural areas as defined by the Department of Agriculture, Forestry and Fisheries
  - Buffer zones (also where it is dictated by elements outside the site):
    - 500m from any irrigated agricultural land



- 1km from residential areas
  - Indicate isolated residential, tourism facilities on or within 1km of the site
- A slope analysis map/layer that include the following slope ranges:
  - Less than 8% slope (preferred areas for turbines and infrastructure)
  - between 8% and 12% slope (potentially sensitive to turbines and infrastructure)
  - between 12% and 14% slope (highly sensitive to turbines and infrastructure)
  - steeper than 18 % slope (unsuitable for turbines and infrastructure)
- A map/layer that indicate locations of birds and bats including roosting and foraging areas (specialist input required)
- A site development proposal map(s)/layer(s) that indicate:
  - Turbine positions
  - Foundation footprint
  - Permanent laydown area footprint
  - Construction period laydown footprint
  - Internal roads indicating width (construction period width and operation period width) and with numbered sections between the other site elements which they serve (to make commenting on sections possible)
  - River, stream and water crossing of roads and cables indicating the type of bridging structures that will be used
  - Substation(s) and/or transformer(s) sites including their entire footprint.
  - Cable routes and trench dimensions (where they are not along internal roads)
  - Connection routes to the distribution/transmission network (the connection must form part of the EIA even if the construction and maintenance thereof will be done by another entity such as ESKOM)
  - Cut and fill areas at turbine sites along roads and at substation/transformer sites indicating the expected volume of each cut and fill
  - Borrow pits
  - Spoil heaps (temporary for topsoil and subsoil and permanently for excess material)
  - Buildings including accommodation

With the above information authorities will be able to assess the strategic and site impacts of the application.

### 3. Regional map and GIS information

The regional map and GIS information should include at least the following:

- All maps/information layers must also be provided in ESRI Shapefile format
- The map/layer must cover an area of 20km around the site
- Indicate the following:
  - roads including their types (tared or gravel) and category (national, provincial, local or private)
  - Railway lines and stations
  - Industrial areas
  - Harbours and airports
  - Electricity transmission and distribution lines and substations
  - Pipelines
  - A visibility assessment of the areas from where the facility will be visible
  - Critical Biodiversity Areas and Ecological Support Areas
  - Critically Endangered and Endangered vegetation areas
  - Agricultural fields
  - Irrigated areas

- An indication of new road or changes and upgrades that must be done to existing roads in order to get equipment onto the site including cut and fill areas and crossings of rivers and streams.

#### 4. Important stakeholders

Amongst other important stakeholders, comments from the National Department of Agriculture, Forestry and Fisheries must be obtained and submitted to the Department. Request for comment must be submitted to:

Mrs. Anneliza Collett  
Directorate: Land Use & Soil Management  
Department of Agriculture, Forestry & Fisheries  
Tel: 012 - 319 7508  
Fax: 012 - 329 5938  
e-mail: AnnelizaC@nda.agric.za  
www.agis.agric.za

In addition, comments must be requested from Eskom (Mr Kevin Leask or Mr Ronald Marais (011) 8008111) regarding grid connectivity and capacity.

### **B. AGRICULTURE STUDY REQUIREMENTS**

- Detailed soil assessment of the site in question, incorporating a radius of 50 m surrounding the site, on a scale of 1:10 000 or finer. The soil assessment should include the following:
  - Identification of the soil forms present on site
  - The size of the area where a particular soil form is found
  - GPS readings of soil survey points
  - The depth of the soil at each survey point
  - Soil colour
  - Limiting factors
  - Clay content
  - Slope of the site
  - A detailed map indicating the locality of the soil forms within the specified area,
  - Size of the site
- Exact locality of the site
- Current activities on the site, developments, buildings
- Surrounding developments / land uses and activities in a radius of 500 m of the site
- Access routes and the condition thereof
- Current status of the land (including erosion, vegetation and a degradation assessment)
- Possible land use options for the site
- Water availability, source and quality (if available)
- Detailed descriptions of why agriculture should or should not be the land use of choice
- Impact of the change of land use on the surrounding area
- A shape file containing the soil forms and relevant attribute data as depicted on the map

## Agricultural study

- Detailed soil assessment of the site in question, incorporating a radius of 50 m surrounding the site, on a scale of 1:10 000 or finer. The soil assessment should include the following:
  - Identification of the soil forms present on site
  - The size of the area where a particular soil form is found
  - GPS readings of soil survey points
  - The depth of the soil at each survey point
  - Soil colour
  - Limiting factors
  - Clay content
  - Slope of the site
  - A detailed map indicating the locality of the soil forms within the specified area,
  - Size of the site
- Exact locality of the site
- Current activities on the site, developments, buildings
- Surrounding developments / land uses and activities in a radius of 500 m of the site
- Access routes and the condition thereof
- Current status of the land (including erosion, vegetation and a degradation assessment)
- Possible land use options for the site
- Water availability, source and quality (if available)
- Detailed descriptions of why agriculture should or should not be the land use of choice
- Impact of the change of land use on the surrounding area
- A shape file containing the soil forms and relevant attribute data as depicted on the map



## APPENDIX D: PUBLIC PARTICIPATION

In terms of section 31 (2) of the EIA regulations (2010), an environmental impact assessment report must include:-

(e) Details of the public participation process conducted in terms of subregulation (1), including:

- (i) Steps undertaken in accordance with the plan of study;
- (ii) A list of persons, organisations and organs of state that were registered as interested and affected parties;
- (iii) A summary of comments received from, and a summary of issues raised by registered interested and affected parties, the date of receipt of these comments and the response of the EAP to those comments; and
- (iv) Copies of any representations, objections and comments received from registered interested and affected parties.

In line with the above-mentioned legislative requirement, this appendix of the EIR provides the details of the public participation process conducted for the proposed Plan 8 Grahamstown Wind Farm Project.

The EIA provides for the involvement of Interested and Affected Parties (I&APs), in forums that allow them to voice their opinions and concerns, at an early stage of the proposed project. Such engagement is critical in the EIA, as it contributes to a better understanding of the proposed project among I&APs, and raises important issues that need to be assessed in the EIA process. There are four key steps within the overall public participation process. These include -

- Notifying I&APs of the EIA;
- Holding public meetings;
- Making provision for I&APs to review and comment on all reports before they are finalised and submitted to the competent authority; and
- Making a record of responses to comments and concerns available to I&APs.

Each of the above mentioned steps, which comprised the public participation process of the proposed development, are discussed in detail.

### Notifying Interested and Affected Parties of the EIA

As stipulated in Section 54 (2) of the EIA Regulations (GNR 543) which states that, “*the person conducting a public participation process .....must give notice to all potential interested and affected parties of the application which is subjected to public participation.....*”, I&APs must be informed of the EIA process. In this regard, the following means of notification which took into consideration the requirements under Section 54 of the EIA Regulations were adopted:

#### Background information document

A four-page Background Information Document (BID) that provided basic information on the proposed project, the EIA process and contact details for registration as an I&AP was prepared. The BID was sent to all persons responding to the inception advertising and organisations identified as potential I&APs identified in previous EIA processes conducted in the area by CES. The BID is reproduced in Appendix D-1.

#### Written notices

##### Initial notification of the Plan 8 Grahamstown Wind Farm Project

Written notices were sent by registered mail to the owners and/or occupants of land immediately surrounding and within 100m of the proposed Plan 8 Grahamstown Wind Energy Project site. Copies of these letters are included in Appendix D2-D4.

Letters were also sent to:

- Makana Municipality
- Department of Agriculture, Rural Development and Land Administration (Mpumalanga)
- Wildlife and Environment Society of Southern Africa (WESSA)
- Department of Agriculture
- Civil Aviation Authority
- Department of Environmental Affairs (DEA)
- Department of Energy
- South African Heritage Resources Agency

Copies of these letters as well as the contact details of these stakeholders are included in Appendix D2-D4.

### **Advertisements**

Regional and local advertisements were placed in *The Herald* and *Grocotts Mail* on the 19<sup>th</sup> and 16<sup>th</sup> of September 2011 respectively in order to:-

- Advise readers of the intention to undertake an EIA for the proposed Plan 8 Grahamstown Wind Energy Project.
- Inform them of the dates, times and venues for public meetings (see section 4.2 below), and;
- Invite them to register as I&APs.

A copy of the advertisement(s) is included in Appendix B-7. A second advertisement was placed in *Grocott's Mail* newspaper in order to:-

- Advise I&APs of the release of the Draft Scoping Report for the proposed Plan 8 Grahamstown Wind Energy Project; and
- Inform them of where they can access the Draft Scoping Report for review
- Inform them of the date, time and venue for the public meeting.

A third round of advertisements (copy included in D-7 ) were placed in *Grocott's Mail* and *The Herald* newspapers on the in order to:-

- Advise I&APs of the release of the Draft EIA Report for the proposed Plan 8 Grahamstown Wind Energy Project; and
- Inform them of where they can access the Draft EIA Report for review;
- Inform them of the date, time and venue for the public meeting.

### **Site notices**

The NEMA regulations require the erection of “*a notice board at a place conspicuous to the public at the boundary or on the fence of the site where the activity to which the application relates is or is to be undertaken; and any alternative site mentioned in the application*”. A site notice was placed at the main entrances to the Farms Gilead, Tower Hill and Peynes Kraal. The text of the site notice and photographs of the fixed notices are provided in Appendix D8 and D9. In addition, Appendix D10 provides a locality map indicating the positions where the site notices were placed.

### **Registration of Interested and Affected Parties**

A register of I&APs has been compiled, containing all available contact details of those who responded to the advertisements, registered as I&APs, attended the public meetings or submitted comments on the draft reports. This has been included in Appendix D12. Please note that I&APs (excluding government, key stakeholders and immediate landowners) have had their personal details blacked out in an effort to protect their privacy.



## **Issues and Response Trail**

A detailed record of all comments and observations made at the public meeting or via written correspondence has been recorded in Issues and Response Trail. This document also provides a record of the response to each issue. Where issues were raised at a public meeting, the verbal response given at the time has been noted.

The document also contains responses prepared by the EAP to issues or questions raised after review of the draft documents.

## **Public review of the draft reports**

### ***Draft Scoping Report***

In line with the second advertisements mentioned above, hard copies of the Draft Scoping report were placed at the Grahamstown Main Public Library so as to be easily accessible by the public. An electronic copy of the Draft Scoping report was also displayed on the EAP's (CES) website - [www.cesnet.co.za](http://www.cesnet.co.za) - via the Public Documents link.

During the public review period (3rd November 2011 – 13th December 2011) for the Draft Environmental Scoping Report (ESR) a public meeting was held at the Graham Hotel's conference venue (14th November 2011) as advertised in the *Grocott's Mail on the 4<sup>th</sup> November 2011* prior to the meeting

All comments received following the review period were considered and necessary changes made to the Draft Scoping Report before submitting the Final Scoping Report to the competent authority, refer to: Coastal & Environmental Services, January 2012: *Final Environmental Scoping Report: Proposed Plan 8 Grahamstown Wind Energy Project, Makana Municipality, Eastern Cape*. CES, Grahamstown.

### ***Issues and concerns arising from the Scoping phase***

All issues and concerns raised by IAP's with regard to the Proposed Plan 8 Grahamstown Wind Energy Project (Coastal & Environmental Services, January 2012: *Final Environmental Scoping Report: Proposed Plan 8 Grahamstown Wind Energy Project, Makana Municipality, Eastern Cape*. CES, Grahamstown), have been addressed in this DEIR report.

An additional stakeholder engagement meeting was held on the 23<sup>rd</sup> January 2012 to address the queries of interested and affected parties. No new or different issues and concerns were raised and are adequately captured in the initial scoping phase issues and response table.

### ***Draft EIR***

In line with the second advertisements mentioned above, hard copies of the Draft Scoping report were placed at the Grahamstown Main Public Library so as to be easily accessible by the public. An electronic copy of the Draft Scoping report was also displayed on the EAP's (CES) website - [www.cesnet.co.za](http://www.cesnet.co.za) - via the Public Documents link.

During the public review period (3rd November 2011 – 13th December 2011) for the Draft Environmental Scoping Report (ESR) a public meeting was held at the Graham Hotel's conference venue (14th November 2011) as advertised in the *Grocott's Mail on the 4<sup>th</sup> November 2011* prior to the meeting.

## **SUBMISSION OF FINAL EIR**

The Final EIR will be submitted to the competent authority once the public review period has been completed.

All comments received following the review period will be considered and necessary changes made to the Draft EIA Report before submitting the Final EIR to the competent authority (DEA) for decision-making.

APPENDIX D-1: BACKGROUND INFORMATION DOCUMENT

**BACKGROUND INFORMATION DOCUMENT & INVITATION TO COMMENT**

**PLAN 8 GRAHAMSTOWN WIND ENERGY PROJECT**

**Background to the project:** Plan 8 (Pty) Ltd, a renewable energy company, plans to develop a wind powered electricity generation facility (known as a 'wind farm') 30km outside of Grahamstown along the N2 in an easterly direction toward East London, in the Eastern Cape Province of South Africa (refer to Figure 1). The proposed site is on the farms Gilead, Tower Hill and Peynes Kraal situated approximately 30km east of Grahamstown. Coastal & Environmental Services (CES) has been appointed by Plan 8 (Pty) Ltd to undertake the necessary environmental investigations for the wind farm, and to apply for approval from the Department of Environmental Affairs (DEA), for its construction and operation, as required by South Africa's environmental legislation. Details of the relevant laws, and an overview of the environmental impact assessment process, are provided on the next page.

**Project description:** The wind farm (refer to Figure 2 for relevant farm portions) is planned to host up to a maximum of 32 turbines, each with a nominal power output ranging between 2-3MW (Mega Watts). The total potential output of the wind farm would be 80MW, and will feed into the national grid.

**Dimensions:** The ultimate size of the wind turbines will depend on further technical assessments but will typically consist of rotor turbines with rotor diameters around 80 meters mounted atop an 80 to 100 meter steel tower. The tower and turbine design and colour have been optimized to minimize visual impact.

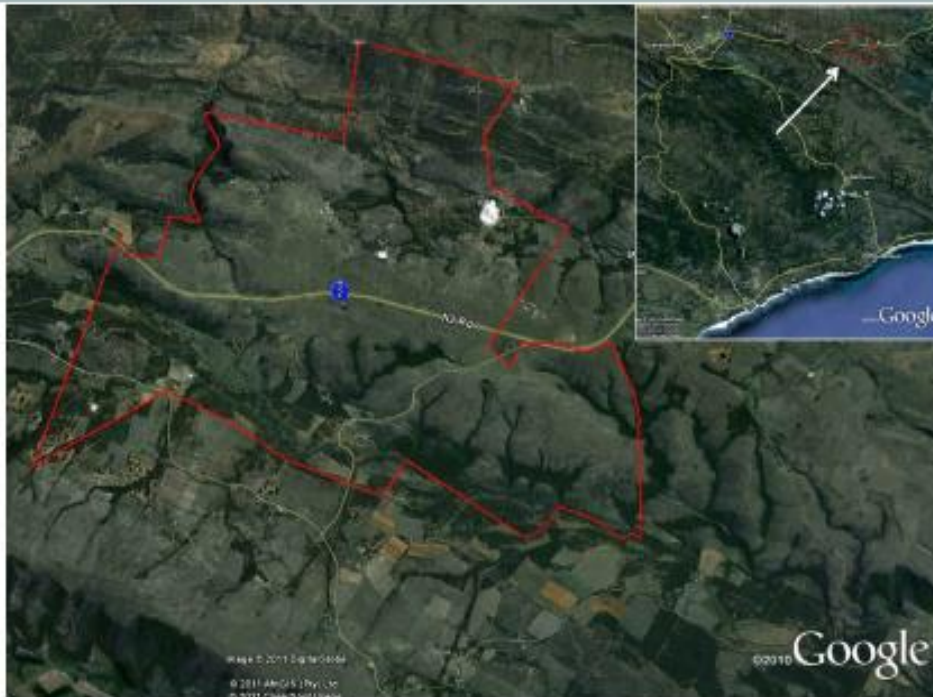


Figure 1: Locality map of the proposed Grahamstown wind farm site, Eastern Cape

**AIM OF THIS DOCUMENT**

The aim of this Background Information Document (BID) is to provide people affected by and interested in the proposed project with information about this project, the process being followed and to provide them with an opportunity to be involved in the Environmental Impact Assessment (EIA) process.



Return address for comments:

Mr Hylton Newcombe

P.O. Box 934  
Grahamstown, 6140

Tel: (046) 622 2364

Fax: (046) 622 6564

Email:  
h.newcombe@cesnet.co.za

**Relevant Legislation**

The Environmental Impact Assessment (EIA) regulations, made in terms of Section 24 of Chapter 5 of the National Environmental Management Act (Act No 107 of 1998), and the related Lists of Activities (Government Notices (GN) R.544, R.545 and R.546 of 18<sup>th</sup> June 2010) specify the activities that require either a Basic Assessment, or a full Scoping and EIA respectively. The activities triggered by the proposed development include:

Number and date of the relevant notice	Activity No(s)	Describe each listed activity
Listing Notice 1 R544	(10)	(10) 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;  (ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.
Listing Notice 1 R544	(38)	(38) The expansion of facilities for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.
Listing Notice 2 R545	(1)	(1) The construction of facilities or infrastructure for the generation of electricity where the electricity is 20 megawatts or more.
Listing Notice 2 R545	(8)	(8) The construction of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.
Listing Notice 2 R545	(15)	(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;  Except where such physical alteration takes place for:  (i) linear development activities; or (ii) agriculture or afforestation where activity 16 in this Schedule will apply.
Listing Notice 3 R546	(4)	(4) The construction of road wider than 4 metres with a reserve less than 13,5metres.
Listing Notice 3 R546	(19)	(19) The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.  (see GNR 546 for specific thresholds)



**The Scoping phase**

The Scoping Phase is important for informing the public and relevant authorities about the nature and size of the proposed project. A critical component of the Scoping Phase is the Public Participation Process, in which Interested and Affected Parties (I&APs) are given an opportunity to raise any issues or concerns they may have about the project. The process is outlined in "Approach to this EIA Process" below. The Draft Scoping Report will be made available for review by the authorities and all I&APs. This report will set the scope for the Environmental Impact Assessment Phase.

**The Environmental Impact Assessment phase**

This phase is more complex and more detailed than the Scoping phase, because it focuses on undertaking a number of specialist studies that have been identified as being necessary during the Scoping phase. These studies provide expert input into the EIA process based on scientific information. I&APs will be consulted again during this phase, and will be given an opportunity to comment on the Draft Environmental Impact Report (EIR) that will contain the specialist reports. During this phase an Environmental Management Plan must also be prepared for the project.

**Environmental Authorisation phase**

The final EIR is submitted to the Department of Water and Environment formerly the Department of Environmental Affairs and Tourism (DEAT) who, after considering the report, will issue an Environmental Authorisation either allowing the project to continue under certain conditions, or requiring additional work to be undertaken.

**Potential issues for investigation**

The following specialist studies will be conducted within the proposed wind farm site, to ascertain any potential impacts, positive and negative, that may occur as a result of pre-construction, construction and operational phases.

- **Visual and aesthetic impacts**

A wind farm will normally have a high visibility due mainly to the height of the turbines.

- **Noise impacts**

The Noise Impact Investigation will be conducted in accordance with the South African National Standard (SANS) 10328 "Methods for environmental noise impact assessments"

- **Ecological impacts**

The location of any species of special concern will be identified, and the location noted in order to inform the mitigation and management measures.

- **Avifaunal impacts**

Potential impacts to birds

- **Bat (Chiroptera) impacts**

Potential impacts to bats

- **Heritage and/or palaeontological impacts**

Potential impacts on heritage, cultural resources and/or fossils etc.

**APPROACH TO THIS ENVIRONMENTAL IMPACT ASSESSMENT**

The process required for the proposed Plan 8 Grahamstown Windfarm Project is an Environmental Impact Assessment. The Process serves primarily to inform the public and relevant authorities about the proposed project and to determine any impact(s). Should all impacts and issues be adequately addressed in the Environmental Impact Report, it will serve as the final document. The EIA process is as follows:



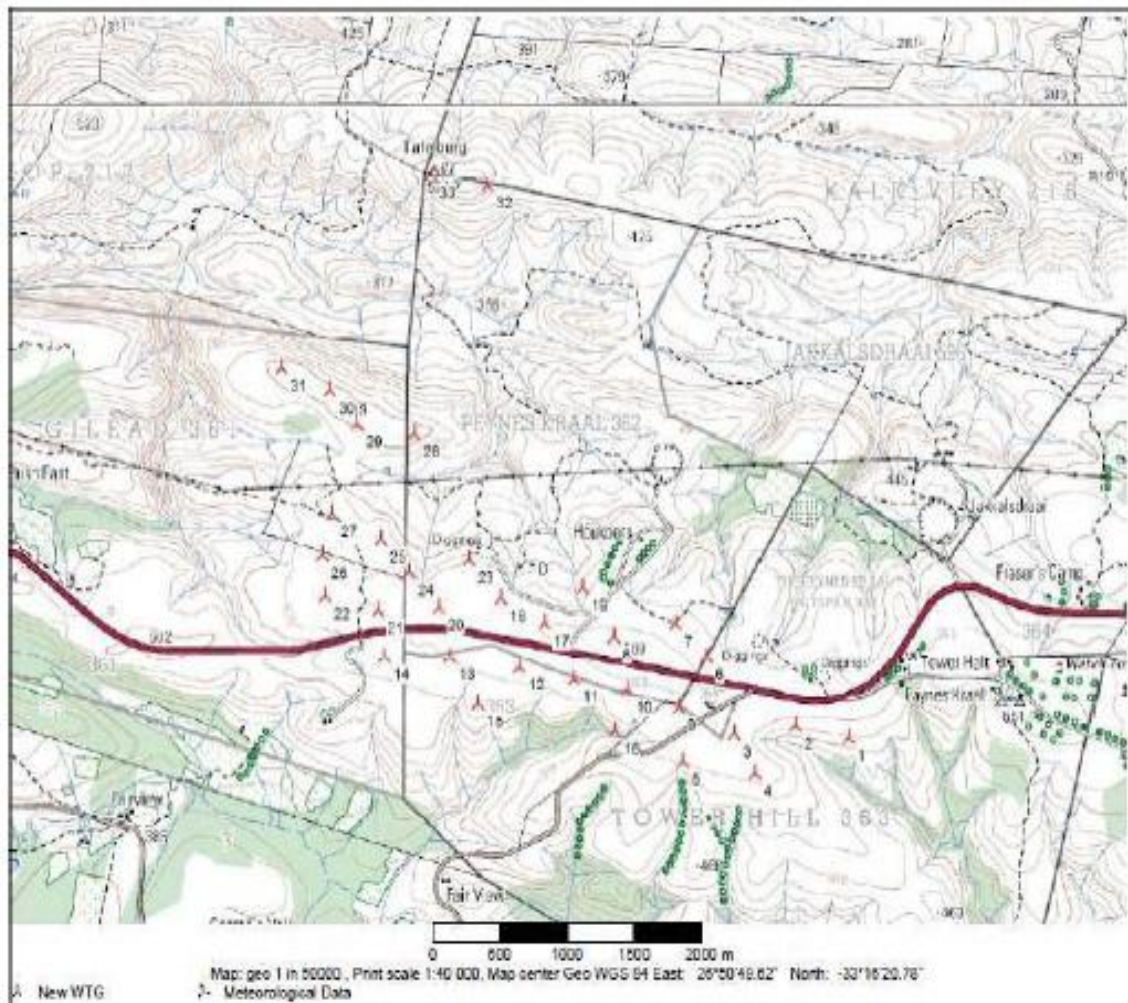


Figure 2: Locality map showing the location of the proposed wind farm and turbine layout

**I hereby wish to register as an Interested and Affected Party (IAP) for the Plan 8 Grahamstown Wind Farm EIA process**

Name: \_\_\_\_\_

Postal address: \_\_\_\_\_

Email: \_\_\_\_\_

Organization: \_\_\_\_\_

Phone #: \_\_\_\_\_

Fax #: \_\_\_\_\_

Please return details to: **Mr Hylton Newcombe**: P.O. Box 934, Grahamstown, 6140  
 Telephone: (046) 622 2364; Fax: (046) 622 6564  
 Email: h.newcombe@cesnet.co.za



**APPENDIX D-2: CONTACT DETAILS AND COPY OF LETTER SENT TO LAND OWNERS AND OCCUPIERS OF LAND IMMEDIATELY SURROUNDING AND WITHIN 100m OF THE PROPOSED PLAN 8GRAHAMSTOWN WIND ENERGY PROJECT DEVELOPMENT SITE**

NAME	OCCUPATION/AFFILIATION	CONTACT				PHYSICAL/POSTAL ADDRESS
		Telephone	Mobile	Fax	Email	
<i>Immediate Landowners</i>						
Gavin Dixon	Farmer. Gilead Farm	46622 7758	84767509 7	86697 5204	<a href="mailto:gbd@geenet.co.za">gbd@geenet.co.za</a>	POBox 6292 Grahamstown, Market Square 6141 (owns farm but does not reside there)
Morne and MarteErwee	Tower Hill Farm		08230077 30 (Morne)		no email address	Fairview farm, Koondesvalley, Grahamstown
Wayne Nortier	Peynes Kraal Farm	466 361 810	82319320 7 (Wayne) 07952743 35 (Felicity)		<a href="mailto:waynenortier@gmail.com">waynenortier@gmail.com</a> <a href="mailto:felicity@dekerk-devilliers.co.za">felicity@dekerk-devilliers.co.za</a>	POBOX 19 Grahamstown 6139 / Hourkers farm Albany District Grahamstown
<i>Surrounding Landowners</i>						
Glyn Dixon	Chairman - Coomb Farmers Association	466 227 776	727 641 303	866 204 765	<a href="mailto:claypits@geenet.co.za">claypits@geenet.co.za</a>	
OrgieCrous	Farmer - Honeykop No361	46622 8474	82660997 4	46622 8474	no email address	PO BOX 362, Grahamstown, 6140
Jeremy Allan			82784680 5		<a href="mailto:jjrallan@yahoo.com">jjrallan@yahoo.com</a>	17 Milner strGrahamstown
Gilbert Coetzee	Coombesvale		82808596 1		<a href="mailto:gmd@geenet.co.za">gmd@geenet.co.za</a>	POBOX 2204 Grahamstown 6140
James Williamson	Glenvoid		82441205 5		<a href="mailto:james@geenet.co.za">james@geenet.co.za</a>	45 Kingsview Estate Miles rdGrahamstown
Andre Coetzee			82659271 0		no email address	POBOX 267 GHT
Fred Pittaway	Valleyview and Kaasvlei (sp.?)	46622 3663	83479276 2		<a href="mailto:valleyview@xfinet.co.za">valleyview@xfinet.co.za</a>	POBOX 2225 GHT
DyobaniByaneyi			82637863 2			262B Grahamstown

## COASTAL & ENVIRONMENTAL SERVICES

Environmental Management and Impact Assessment



67 African Street  
P O Box 934  
Grahamstown 6139  
SOUTH AFRICA  
Tel: 046 622 2364  
Fax: 046 622 6564  
Email: info@cesnet.co.za  
Website: www.cesnet.co.za

13 October 2011

**ATTENTION: OWNERS AND/OR OCCUPIERS OF LAND IMMEDIATELY SURROUNDING OR WITHIN 100m OF PLAN 8 GRAHAMSTOWN WIND FARM NEAR GRAHAMSTOWN IN THE EASTERN CAPE**

**NOTIFICATION OF ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF A WIND ENERGY PROJECT AT GRAHAMSTOWN IN THE EASTERN CAPE PROVINCE OF SOUTH AFRICA**

In accordance with the requirements of the National Environmental Management Act 1998 (Act No. 107 of 1998) and relevant Environmental Impact Assessment (EIA) regulations made in terms of this Act (Government Notice No R.543) dated 18 June 2010, notification is hereby given in terms of Regulation 15: "Activity on land owned by person other than applicant". In accordance with this requirement, please find here-with a letter of notification for an environmental impact assessment being carried out by Coastal and Environmental Services in respect of the above-mentioned project.

Plan 8 (Pty) Ltd - a renewable energy company, plans to develop a wind power generation facility (known as a 'wind farm') 30km outside Grahamstown, toward East London, along the N2 located in the Makana Municipality in the Eastern Cape Province of South Africa. The proposed project is planned to host up to 32 turbines, each with a nominal power output ranging between 2-3 Mega Watts (MW). The total potential output of the wind farm would be 80MW. The wind farm will cover an area of approximately 2 550 hectares.

- Coastal & Environmental Services (CES) of Grahamstown have been appointed by Plan 8 (Pty) Limited, to conduct an environmental impact assessment for the proposed development. The activities that we believe will be triggered by the proposed development are listed in the application and the Background Information Document (BID) that is attached to this letter.
- A public meeting will be held to present the project and to give the public an opportunity to comment on the proposed development. You will be notified of the date, time and venue for the public meeting accordingly.
- CES would highly appreciate it if you could please send us a letter confirming your receipt of this notification. For more information, please feel free to contact Mr. Hylton Newcombe at the CES Grahamstown office numbers shown above.

Yours sincerely,

**Hylton Newcombe**  
Environmental Consultant

East London: Tel: 043 742 3302 Fax: 043 742 3306 Email: cesel@cesnet.co.za

Henque 1018 t/a Coastal and Environmental Services • Reg no. CK 1997/061914/23 • Vat No. 4380172835

Members: Dr AM Avis (PhD Rhodes) • Prof RA Lubke (PhD Western Ontario)

Mrs CE Avis (MA Rhodes, CAIB) • Dr AR Carter (PhD Rhodes, CPA USA) • Mr WSJ Rowston (Bsc Hons CivEng)

Mrs J Gopal (B.Optom, Hons) • Dr KJ Whittington-Jones (PhD Rhodes) • Mr M Gopal • Mrs BK Emslie (B.Comm Accounting Rhodes)

## COASTAL & ENVIRONMENTAL SERVICES

Environmental Management and Impact Assessment



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Email: info@cesnet.co.za  
Website: www.cesnet.co.za

18 October 2011

**ATTENTION: OWNERS AND/OR OCCUPIERS OF LAND IMMEDIATELY SURROUNDING OR WITHIN 100m OF PLAN 8 GRAHAMSTOWN WIND FARM NEAR GRAHAMSTOWN IN THE EASTERN CAPE**

**NOTIFICATION OF ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF A WIND ENERGY PROJECT AT GRAHAMSTOWN IN THE EASTERN CAPE PROVINCE OF SOUTH AFRICA**

In accordance with the requirements of section 56 (2) (b) (v) of the Environmental Impact Assessment Regulations (2010) made in terms of section 24(5) of the National Environmental Management Act (Act No 107 of 1998) as amended, we are required to, "give written notice to the owners and occupiers of land adjacent to the site where a proposed development activity is or is to be undertaken or to any alternative site". In accordance with this requirement, please find here-with a letter of notification for a basic environmental assessment being carried out by Coastal and Environmental Services in respect of the above-mentioned project.

Plan 8 (Pty) Ltd - a renewable energy company, plans to develop a wind power generation facility (known as a 'wind farm') 30km outside Grahamstown, toward East London, along the N2 located in the Makana Municipality in the Eastern Cape Province of South Africa. The proposed project is planned to host up to 32 turbines, each with a nominal power output ranging between 2-3 Mega Watts (MW). The total potential output of the wind farm would be 80MW. The wind farm will cover an area of approximately 2 550 hectares.

- Coastal & Environmental Services (CES) of Grahamstown have been appointed by Plan 8 (Pty) Limited, to conduct an environmental impact assessment for the proposed development. The activities that we believe will be triggered by the proposed development are listed in the application and the Background Information Document (BID) that is attached to this letter.
- A public meeting will be held to present the project and to give the public an opportunity to comment on the proposed development. You will be notified of the date, time and venue for the public meeting accordingly.
- CES would highly appreciate it if you could please send us a letter confirming your receipt of this notification. For more information, please feel free to contact Mr. Hylton Newcombe at the CES Grahamstown office numbers shown above.

Yours sincerely,

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Mrs J Gopal (B.Optom, Hons) • Dr KJ Whittington-Jones (PhD Rhodes) • Mr M Gopal • Mrs BK Emslie (B.Comm Accounting Rhodes)

**APPENDIX D-3: CONTACT DETAILS AND COPIES OF THE LETTERS SENT TO GOVERNMENT DEPARTMENTS, MUNICIPALITIES AND OTHER KEY STAKEHOLDERS AND PROOF OF REGISTERD LETTERS SENT TO THE ABOVE MENTIONED AND IMMEDIATE LANDOWNERS**

NAME	OCCUPATION/ AFFILIATION	CONTACT				PHYSICAL/POSTAL ADDRESS
		Telephone	Mobile	Fax	Email	
<i>Government</i>						
Mr Briant Noncembu	DEDEA (Amathole)				<a href="mailto:Briant.Noncembu@deaet.ecaape.gov.za">Briant.Noncembu@deaet.ecaape.gov.za</a>	Private Bag X5029 Mthatha 5099
Carin Swart	DEDEA				<a href="mailto:Carin.Swart@deaet.ecaape.gov.za">Carin.Swart@deaet.ecaape.gov.za</a>	
Dan Malgas	DAFF Forestry				<a href="mailto:MalgasM@dwaf.gov.za">MalgasM@dwaf.gov.za</a>	
S. Gwen	DAFF Forestry	(043) 604 5301			<a href="mailto:gwendolines@daff.gov.za">gwendolines@daff.gov.za</a>	
Anneliza Collott	DAFF Agri				<a href="mailto:annelizac@nda.agric.za">annelizac@nda.agric.za</a>	
M Mathekgana	Dept of Energy	(012) 444-4261			mokgadi.mathekgana@energy.gov.za	
<i>Municipality</i>						
Ntonek Ncweka	Makana Municipality			072 8195472	<a href="mailto:ntontela@makana.gov.za">ntontela@makana.gov.za</a>	
Anele Kwayimani	Makana Municipality	046 622 9186	046 603 6062	083 6955 406	<a href="mailto:anele.kwayimani@webmail.co.za">anele.kwayimani@webmail.co.za</a>	
Xhanli Bokue	Makana Municipality			083 335 4843		
Casa Yonela	Makana Municipality			072 13302 92	<a href="mailto:casayo@webmail.co.za">casayo@webmail.co.za</a>	
<i>Key Stakeholders</i>						
Nanna Gouws	SANRAL				<a href="mailto:GouwsJ@nra.co.za">GouwsJ@nra.co.za</a>	
Mariagrazia Galamberti	SAHRA				<a href="mailto:mgalimberti@sahra.org.za">mgalimberti@sahra.org.za</a>	
Xolani Wana	ESKOM				<a href="mailto:Xolani.Wana@eskom.co.za">Xolani.Wana@eskom.co.za</a>	
Lizelle Stroh	SACAA				<a href="mailto:strohl@caa.co.za">strohl@caa.co.za</a>	
Irene de Moor	WESSA				<a href="mailto:irenedemoor@imagineet.co.za">irenedemoor@imagineet.co.za</a>	
Jenny Gon	WESSA				<a href="mailto:j-gon@intekom.co.za">j-gon@intekom.co.za</a>	PO Box 73, Grahamstown, 6140



**COASTAL & ENVIRONMENTAL SERVICES**  
Environmental Management and Impact Assessment



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Tel: 046 622 2364  
Fax: 046 622 6564  
Email: info@cesnet.co.za  
Website: www.cesnet.co.za

13 October 2011

Department of Environmental Affairs  
Private Bag X447  
Pretoria  
0001

**Attention:** Administration Officer

**NOTIFICATION OF ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF A WIND ENERGY PROJECT AT GRAHAMSTOWN IN THE EASTERN CAPE PROVINCE OF SOUTH AFRICA**

In accordance with the requirements of section 54 (2) (b) (vi) of the Environmental Impact Assessment Regulations (2010) made in terms of section 24(5) of the National Environmental Management Act (Act No 107 of 1998) as amended, we are required to, "give written notice to any organ of state having jurisdiction in respect of any aspect of the activity". In accordance with this requirement, please find here-with a letter of notification for an environmental impact assessment being carried out by Coastal and Environmental Services in respect of the above-mentioned project.

Plan 8 (Pty) Ltd - a renewable energy company, plans to develop a wind power generation facility (known as a 'wind farm') 30km outside Grahamstown, toward East London, along the N2 located in the Makana Municipality in the Eastern Cape Province of South Africa. The proposed project is planned to host up to 32 turbines, each with a nominal power output ranging between 2-3 Mega Watts (MW). The total potential output of the wind farm would be 80MW. The wind farm will cover an area of approximately 2 550 hectares.

- Coastal & Environmental Services (CES) of Grahamstown have been appointed by Plan 8 (Pty) Limited, to conduct an environmental impact assessment for the proposed development. The activities that we believe will be triggered by the proposed development are listed in the application and the Background Information Document (BID) that is attached to this letter.
- A public meeting will be held to present the project and to give the public an opportunity to comment on the proposed development. You will be notified of the date, time and venue for the public meeting accordingly.
- CES would highly appreciate it if you could please send us a letter confirming your receipt of this notification. For more information, please feel free to contact Mr. Hylton Newcombe at the CES Grahamstown office numbers shown above.

Yours sincerely,

**Hylton Newcombe**  
Environmental Consultant

East London: Tel: 043 742 3302 Fax: 043 742 3306 Email: cesel@cesnet.co.za

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Members: Dr AM Avis (PhD Rhodes) • Prof RA Lubke (PhD Western Ontario)  
Mrs CE Avis (MA Rhodes, CAIB) • Dr AR Carter (PhD Rhodes, CPA USA) • Mr WSJ Rowiston (Bsc Hons CivEng)  
Mrs J Gopal (B.Optom, Hons) • Dr KJ Whittington-Jones (PhD Rhodes) • Mr M Gopal • Mrs BK Emslie (B.Comm Accounting Rhodes)

**COASTAL & ENVIRONMENTAL SERVICES**  
Environmental Management and Impact Assessment



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Grahamstown 6139  
SOUTH AFRICA  
Tel: 046 622 2364  
Fax: 046 622 6564  
Email: info@cesnet.co.za  
Website: www.cesnet.co.za

13 October 2011

Department of Economic Development and Environmental Affairs  
Private Bag X5001  
Greenacres,  
Port Elizabeth  
6057

**Attention:** Mr Leon Els

**NOTIFICATION OF ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF A WIND ENERGY PROJECT AT GRAHAMSTOWN IN THE EASTERN CAPE PROVINCE OF SOUTH AFRICA**

In accordance with the requirements of section 54 (2) (b) (vi) of the Environmental Impact Assessment Regulations (2010) made in terms of section 24(5) of the National Environmental Management Act (Act No 107 of 1998) as amended, we are required to, "give written notice to any organ of state having jurisdiction in respect of any aspect of the activity". In accordance with this requirement, please find here-with a letter of notification for an environmental impact assessment being carried out by Coastal and Environmental Services in respect of the above-mentioned project.

Plan 8 (Pty) Ltd - a renewable energy company, plans to develop a wind power generation facility (known as a 'wind farm') 30km outside Grahamstown, toward East London, along the N2 located in the Makana Municipality in the Eastern Cape Province of South Africa. The proposed project is planned to host up to 32 turbines, each with a nominal power output ranging between 2-3 Mega Watts (MW). The total potential output of the wind farm would be 80MW. The wind farm will cover an area of approximately 2 550 hectares.

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Yours sincerely,

**Hylton Newcombe**  
Environmental Consultant

East London: Tel: 043 742 3302 Fax: 043 742 3306 Email: oesel@oesnet.co.za

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Members: Dr AM Avis (PhD Rhodes) • Prof RA Lubke (PhD Western Ontario)  
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Mrs J Gopal (B. Optom, Hons) • Dr KJ Whittington-Jones (PhD Rhodes) • Mr M Gopal • Mrs BK Emslie (B.Comm Accounting Rhodes)



## COASTAL & ENVIRONMENTAL SERVICES

Environmental Management and Impact Assessment



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Email: [info@cesnet.co.za](mailto:info@cesnet.co.za)  
Website: [www.cesnet.co.za](http://www.cesnet.co.za)

13 October 2011

Mr Ntomebekhaya Baart  
Makana Local Municipality  
City Hall,  
High Street,  
Grahamstown,  
6140

**ATTENTION: Mr Ntomebekhaya Baart**

**NOTIFICATION OF ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF A WIND ENERGY PROJECT AT GRAHAMSTOWN IN THE EASTERN CAPE PROVINCE OF SOUTH AFRICA**

In accordance with the requirements of section 54 (2) (b) (v) of the Environmental Impact Assessment Regulations (2010) made in terms of section 24(5) of the National Environmental Management Act (Act No 107 of 1998) as amended, we are required to, "give written notice to the municipality which has jurisdiction in the area". In accordance with this requirement, please find here-with a letter of notification for an environmental impact assessment being carried out by Coastal and Environmental Services in respect of the above-mentioned project.

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Yours sincerely,

**Hylton Newcombe**  
Environmental Consultant

East London: Tel: 043 742 3302 Fax: 043 742 3306 Email: [cesel@cesnet.co.za](mailto:cesel@cesnet.co.za)

Henque 1018 t/a Coastal and Environmental Services • Reg no. CK 1997/061914/23 • Vat No. 4380172835

Members: Dr AM Avis (PhD Rhodes) • Prof RA Lubke (PhD Western Ontario)

Mrs CE Avis (MA Rhodes, CAIB) • Dr AR Carter (PhD Rhodes, CPA USA) • Mr WSJ Rowiston (Bsc Hons CivEng)

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**COASTAL & ENVIRONMENTAL SERVICES**  
Environmental Management and Impact Assessment



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SOUTH AFRICA  
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Email: info@cesnet.co.za  
Website: www.cesnet.co.za

13 October 2011

South African Civil Aviation Authority  
Private Bag X73  
Halfway House  
1685

**To Whom It May Concern**

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Website: [www.cesnet.co.za](http://www.cesnet.co.za)

13 October 2011

Mrs Anneliza Collett,  
Directorate: Land Use and Soil Management,  
Department of Agriculture, Forestry and Fisheries  
Private Bag X250,  
Pretoria,  
0001

**ATTENTION: Mrs Anneliza Collett**

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Environmental Consultant

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13 October 2011

Department of Energy  
Private Bag X59  
Pretoria  
0001

**ATTENTION:** Ms M Mathekgana

CC: Mr A. Otto; Ms N. Qase

**NOTIFICATION OF ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF A WIND ENERGY PROJECT AT GRAHAMSTOWN IN THE EASTERN CAPE PROVINCE OF SOUTH AFRICA**

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13 October 2011

Department of Water Affairs  
P.O. Box 7019  
EAST LONDON  
5200

ATTENTION: Ms Lizna Fourie

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13 October 2011

ESKOM Holdings Limited  
Private Bag X1  
Beacon Bay  
5205

**ATTENTION: Mr. Tom Smith,**

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Website: www.cesnet.co.za

13 October 2011

South African Heritage Resources Agency  
P.O. Box 759  
EAST LONDON  
5200

**ATTENTION:** The Provincial Manager

CC: The Provincial Manager Western Cape Provincial Office

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19 October 2011

Pumzo Mdleleni  
Vodacom  
Vodacom SA Eastern Region  
P.O. Box 27504  
Greenacres  
Port Elizabeth,  
6004

**ATTENTION: Pumzo Mdleleni,**

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Website: www.cesnet.co.za

13 October 2011

Wildlife and Environment Society of Southern Africa  
PO Box 73,  
Grahamstown,  
6140,  
Eastern Cape, South Africa

**ATTENTION: Mrs. Jennifer Gon,**

**NOTIFICATION OF ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF A WIND ENERGY PROJECT AT GRAHAMSTOWN IN THE EASTERN CAPE PROVINCE OF SOUTH AFRICA**

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Environmental Consultant

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Website: www.cesnet.co.za

13 April 2012

Adv. Rolly Dumezweni  
Ndlambe Local Municipality  
P.O. Box 13  
Port Alfred  
6170

**ATTENTION: Municipal Manager-Adv. Rolly Dumezweni**

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Yours sincerely,

**Jadon Schmidt**  
Senior Environmental Consultant

East London: Tel: 043 742 3302 Fax: 043 742 3306 Email: cesel@cesnet.co.za

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Proof of invoice for the mailing of the registered letters

**List of REGISTERED LETTERS**  
**Lys van GEREGISTREERDE BRIEWE** (B2)  
 (with an insurance option/met 'n versekeringsopsie)



Full tracking and tracing/Volledige volg en spoor

Name and address of sender:  
 Naam en adres van afsender: AMBER JACKSON - C. E. S  
67 AFRICAN STREET  
GRAHAMSTOWN 6140

Enquiries/Navrae  
 Toll-free number  
 Toevy nommer  
**0800 111 502**

No	Name and address of addressee Naam en adres van geadresseerde	Insured amount Versekerde bedrag	Insurance fee Versekeringsgeld	Postage Posgeld	Service fee Diensgeld	Affix Track and Trace customer copy Plak Volg-en-Spoor- KLEEF 'N VOLG-EN-SPOOR- REGISTERED LETTER (with a domestic insurance option) ShareCall 0800 111 502 www.sags.co.za RD 665 761 577 ZA CUSTOMER COPY 381028R	
1	MS LERNA FOURIE - DEPT OF WATER AFFAIRS PO BOX 7019 EAST LONDON 5200					REGISTERED LETTER (with a domestic insurance option) ShareCall 0800 111 502 www.sags.co.za RD 665 761 585 ZA CUSTOMER COPY 381028R	
2	MS. M MATHEKGANA - DEPT. OF ENERGY PIBAKI 159 PRETORIA 0021					REGISTERED LETTER (with a domestic insurance option) ShareCall 0800 111 502 www.sags.co.za RD 665 761 550 ZA CUSTOMER COPY 381028R	
3	DYOBANI BYANEH 262 B GRAHAMSTOWN 6140					REGISTERED LETTER (with a domestic insurance option) ShareCall 0800 111 502 www.sags.co.za RD 665 761 563 ZA CUSTOMER COPY 381028R	
4	FRED BITTANAY - VALLEVIEW 1 KAASVEL PO BOX 2225 GRAHAMSTOWN 6140					REGISTERED LETTER (with a domestic insurance option) ShareCall 0800 111 502 www.sags.co.za RD 665 761 546 ZA CUSTOMER COPY 381028R	
5	ANDRE CRETZEE PO BOX 267 GRAHAMSTOWN 6140					REGISTERED LETTER (with a domestic insurance option) ShareCall 0800 111 502 www.sags.co.za RD 665 761 532 ZA CUSTOMER COPY 381028R	
6	JAMES WILLADSON - GLENVOID 45 KINGSDOWN ESTATE MILES ROAD GHT 6140					REGISTERED LETTER (with a domestic insurance option) ShareCall 0800 111 502 www.sags.co.za RD 665 761 648 ZA CUSTOMER COPY 381028R	
7	GILBERT CRETZEE - COMBUSTVALE PO BOX 2204 GHT 6140					REGISTERED LETTER (with a domestic insurance option) ShareCall 0800 111 502 www.sags.co.za RD 665 761 634 ZA CUSTOMER COPY 381028R	
8	JEREMY ALLAN 17 MILNER STREET GHT 6140					REGISTERED LETTER (with a domestic insurance option) ShareCall 0800 111 502 www.sags.co.za RD 665 761 625 ZA CUSTOMER COPY 381028R	
9	ORGIE COULS - HONEYKOP N°301 PO BOX 362, GRAHAMSTOWN 6140					REGISTERED LETTER (with a domestic insurance option) ShareCall 0800 111 502 www.sags.co.za RD 665 761 617 ZA CUSTOMER COPY 381028R	
10	NYNE NOETHER - PEINES KRAAL FARM GRAHAMSTOWN 6140						
		Total Totaal	R	R	R	R	

Number of letters posted  
 Getal briewe gepos 10/TEN

Signature of client  
 Handtekening van kliënt *[Signature]*

Signature of accepting officer  
 Handtekening van aanneembeampte *[Signature]*

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance of up to R2 000,00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100,00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering van tot R2 000,00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.



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**List of REGISTERED LETTERS**  
**Lys van GEREGISTREERDE BRIEWE**  
*(with an insurance option/met 'n versekeringsopsie)*

(B2)



**Full tracking and tracing/Volledige volg en spoor**

Name and address of sender:  
 Naam en adres van afsender: A JACKSON - C.E.S  
67 AFRICAN STREET  
GRAHAMSTOWN

Enquiries/Nawrae  
 Toll-free number  
 Tolvry nommer  
**0800 111 502**

No	Name and address of addressee Naam en adres van geadresseerde	Insured amount Versekerde bedrag	Insurance fee Versekeringsgeld	Postage Posgeld	Service fee Diensgeld	Affix Track and Trace customer copy Plak Volg-en-Spoor-kliantafskrif
1	MORNE & MARTE ELWEE - TOWER HALL FARM FAIRVIEW FARM KOOXESTADLEY GFT 6140					REGISTERED LETTER (with a domestic insurance option) RD 665 761 603 ZA CUSTOMER COPY 301028R
2	GAYN DIXON - GILEAD FARM PO BOX 6242 G.H.T. 6140					REGISTERED LETTER (with a domestic insurance option) RD 665 761 594 ZA CUSTOMER COPY 301028R
3	MRS ANJELIZA CALET - DEPT OF AGIC, FORESTRY & FISHERIES P/BAG X250 PRETORIA 0001					REGISTERED LETTER (with a domestic insurance option) RD 665 761 696 ZA CUSTOMER COPY 301028R
4	MR TOM SMITH - ESCROW HOLDINGS LTD P/BAG X1 BEACH BAY EAST LONDON 6205					REGISTERED LETTER (with a domestic insurance option) RD 665 761 705 ZA CUSTOMER COPY 301028R
5	TO MEMORIAL WAY GARDEN - SA CAA P/BAG X73 HAPPY HOUSE 1685					REGISTERED LETTER (with a domestic insurance option) RD 665 761 682 ZA CUSTOMER COPY 301028R
6	MRS JENNIFER GOW - NESSA PO BOX 73 GRAHAMSTOWN 6140					REGISTERED LETTER (with a domestic insurance option) RD 665 761 679 ZA CUSTOMER COPY 301028R
7	THE PROVINCIAL MANAGER - SAHRA PO BOX 759, EAST LONDON 5200					REGISTERED LETTER (with a domestic insurance option) RD 665 761 651 ZA CUSTOMER COPY 301028R
8	MRS NDIYERHAYA BAAET - MAKANA L.M CITY HALL HIGH STREET GHT 6140					REGISTERED LETTER (with a domestic insurance option) RD 665 761 665 ZA CUSTOMER COPY 301028R
9	MR. LEON ELS - DEDEA P/BAG X504 GREENACRES PE 6057					REGISTERED LETTER (with a domestic insurance option) RD 665 761 722 ZA CUSTOMER COPY 301028R
10	ADMIN OFFICER - DEPT OF ENV AFFAIRS P/BAG X447 PRETORIA 0001					REGISTERED LETTER (with a domestic insurance option) RD 665 761 719 ZA CUSTOMER COPY 301028R
Number of letters posted Getal briewe gepos <u>10/ten</u>		Total Totaal	R	R	R	R

Signature of client  
 Handtekening van klient [Signature]

Signature of accepting officer  
 Handtekening van aanneembeampte [Signature]

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance of up to R2 000,00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100,00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering van tot R2 000,00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.





**APPENDIX D-4: COPIES OF NEWSPAPER ADVERTISEMENTS NOTIFYING I&APS OF THE PROPOSED PLAN 8 GRAHAMSTOWN WIND ENERGY PROJECT (Inception Phase), RELEASE OF DRAFT SCOPING REPORT & NOTIFICATION OF PUBLIC MEETING AND RELEASE OF DRAFT ENVIRONMENTAL IMPACT REPORT & NOTIFICATION OF PUBLIC MEETING**

**THE HERALD (Provincial) – 19 September 2011**

**The Herald CLASSIFIEDS** Friday September 16, 2011 **19**

**11030 Estate Notices**

In the Estate of the late MEYER HERSHMAN, identity no. 183107-5029-08-1, born on 7 November 1918, a widower of 17 - 15<sup>th</sup> Avenue, Wilmer, who died at Port Elizabeth on 4 July 2011. Estate no. 4960/2011

Debtors and Creditors in the above Estate are hereby called upon to lodge their claims with and pay their debts to the undersigned within a period of thirty (30) days as from the date of publication hereof.

PKF (PE) INC.  
PO Box 7806  
Newton Park  
6055  
Phone (041) 398-8800

In the Estate of the late XOLA TANSANDA ANTONIE, date of birth 31 August 1960, of 13 Ngqoko, Kwanqozo, Port Elizabeth, date of death 14 March 2011. Surviving spouse MAGDALENE RUDWINE ANTONIE, date of birth 22 April 1965, identity no. 690422-3884-08-5. Estate no. 1761/2011

All persons having claims against the above mentioned estate must lodge it with the Executor concerned within 30 days from date of publication hereof.

CHS ATTORNEYS  
Suite No. 2  
Second Floor  
Africa House  
Graham Street  
North End  
Port Elizabeth.  
Phone (041) 484-0222  
Ref: C H Spence/ RA/A-30

In the Estate of the late NOMACHINA PRISCILLA NGQOLENI, date of birth 8 September 1964, identity no. 640808-0780-08-6, of 39 Makhelela Street, Zwick, Port Elizabeth, date of death 6 June 2008. Estate no. 2611/2008

All persons having claims against the abovementioned estate must lodge it with the Executor concerned within 30 days from date of publication hereof.

TANIA KIDEN ATTORNEYS  
29 Mount Road  
Mount Crook  
Port Elizabeth  
Phone (041) 373-2844

**11030 Estate Notices**

In the Estate of the late DAMON DANRICK KERSPUY, identity no. 400810-5081-08-7, born on 10 August 1945, of 20 Colman Street, Getzendale, Port Elizabeth, who died at Port Elizabeth on 29 November 2008, married in community of property to MAUREEN KERSPUY, identity no. 576217-0141-08-5. Estate no. 6313/2008 (PE)

The First and Final Liquidation and Distribution Account in the above Estate will be for inspection at the office of the Master of the High Court, Port Elizabeth for a period of twenty-one (21) days from the date of publication hereof.

RUSHMERE NOACH INCORPORATED  
Agent for the Executor  
5 Ascot Office Park  
Coryngham Road  
Greenacres  
PO Box 100  
Port Elizabeth.  
Phone (041) 2956711  
Ref: JD Storer

**11030 Appointments**

In the Estate of the late ANDILE ERIC MDLELENI, died on 28 April 2008, identity no. 670505-5823-08-0, of 8 Amalinda Street, Bridgemead, Port Elizabeth, married to THOKOZILE THERESSA MDLELENI, born on 13 October 1977, identity no. 771013-0472-08-4. Estate no. 3170/2008

The First and Final Liquidation and Distribution Account in the above Estate will be for inspection at the office of the Master of the High Court, Port Elizabeth for 21 days from 18 September 2011.

FNB TRUST SERVICES  
PO Box 27521  
Greenacres  
Port Elizabeth  
6057

**ENVIRONMENTAL IMPACT ASSESSMENT PROCESS**



**PROPOSED DEVELOPMENT OF THE PLAN 8 GRAHAMSTOWN WIND ENERGY PROJECT**

Notice is given in terms of regulation 54(2) as published in the Government Gazette No 543 Environmental Impact Assessment (EIA) regulations of the National Environmental Management Act (Act No 107 of 1998) for intent to undertake an EIA

Plan 8 (Pty) Ltd is proposing to construct a Wind Energy Project to be developed outside of Grahamstown, along the N2 freeway, in the Eastern Cape Province of South Africa. The proposed project will entail the construction and operation of up to 33 turbines each generating 2-3 MW of power with a total capacity of 80MW. The proposed development will cover an area of approximately 2,550 hectares.

**You are invited to register as an Interested and Affected Party (I&AP).**

Please contact: Mr Hylton Newcombe,  
P.O. Box 934, Grahamstown.  
Tel: 046-622 2364; Fax: 046-622 6564  
Email: h.newcombe@cesnet.co.za.

1609-152015/AND



Grocott's Mail Friday, 16 September 2011

NEWS

19

## ENVIRONMENTAL IMPACT ASSESSMENT PROCESS



### PROPOSED DEVELOPMENT OF THE PLAN 8 GRAHAMSTOWN WIND ENERGY PROJECT

Notice is given in terms of regulation 54(2) as published in the Government Gazette No 543 Environmental Impact Assessment (EIA) regulations of the National Environmental Management Act (Act No 107 of 1998) for intent to undertake an EIA.


Plan 8 (Pty) Ltd is proposing to construct a Wind Energy Project to be developed outside of Grahamstown, along the N2 freeway, in the Eastern Cape Province of South Africa. The proposed project will entail the construction and operation of up to 33 turbines each generating 2-3 MW of power with a total capacity of 80MW. The proposed development will cover an area of approximately 2,550 hectares.

**You are invited to register as an Interested and Affected Party (I&AP).** Please contact: Mr Hylton Newcombe, P.O. Box 934, Grahamstown. Tel: 046-622 2364; Fax: 046-622 6564 Email: [h.newcombe@cesnet.co.za](mailto:h.newcombe@cesnet.co.za).

**COPY OF NEWSPAPER ADVERTISEMENT NOTIFYING I&APS OF THE PROPOSED DRAFT SCOPING REPORT WHEREABOUTS AND THE TIME, DATE AND VENUE FOR THE PUBLIC MEETING AND THE DURATION OF THE REVIEW PERIOD FOR THE PLAN 8 GRAHAMSTOWN WIND ENERGY PROJECT**

**THE EP HERALD(Provincial) – 2<sup>nd</sup> November 2011**

**Wednesday**  
November 2, 2011 **17**



**ENVIRONMENTAL IMPACT ASSESSMENT  
PROCESS**

**PUBLIC REVIEW OF DRAFT SCOPING REPORT**  
**PROPOSED PLAN 8 GRAHAMSTOWN WIND  
ENERGY PROJECT,**  
**EASTERN CAPE, SOUTH AFRICA**

**DEA REFERENCE NUMBER: 12/12/20/2523**

Notice is given in terms of regulation 54(2) as published in the Government Gazette No 543 Environmental Impact Assessment (EIA) regulations of the National Environmental Management Act (Act No 107 of 1998) for intent to undertake an Environmental Impact Assessment, as governed by GN 545.

Plan 8 (Pty) Ltd – a renewable energy company, plans to develop a wind power generation facility (known as a “windfarm”) 30km outside of Grahamstown, towards East London, along the N2 located in the Makana Municipality in the Eastern Cape Province of South Africa. The proposed project is planned to host up to 32 turbines, each with a nominal output ranging between 2-3MW. The total potential output of the windfarm would be 80MW.

All Interested and Affected Parties are hereby notified of the availability of the Draft Scoping Report (DSR) for public review and comment. The required 40 day review period is from **2 November 2011 to 12 December 2011**. Copies of the DSR are available for review and comment at the following locations:

- Grahamstown Main Public Library
- The CES website ([www.cesnet.co.za](http://www.cesnet.co.za)) – click on the “Public Documents”.

All Interested and Affected Parties and members of the public are invited to attend the public meeting on **14 November 2011 at 18h00 at The Graham Hotel conference venue, Grahamstown**. The findings of the DSR report will be presented to attendees, followed by a general discussion.

For further information and submission of comments, please do not hesitate to contact: Mr Thomas King, P.O. Box 934, Grahamstown 6140. Tel: 046-622 2364; Fax: 046-6226564 Email: [t.king@cesnet.co.za](mailto:t.king@cesnet.co.za).

0211152294/W0



GROCOTT'S MAIL (Local) – – 4<sup>th</sup> November 2011

Grocott's Mail Friday, 4 November 2011

INTERFAITH

Thought for the week

# Great is your love towards us

KING David was overwhelmed by God's love and deliverance of his life; a love and deliverance every born-again child of God knows.

A love that has called, set free, forgiven, a love that perseveres, comforts and strengthens. A love and deliverance that stirs in our hearts a desire to walk in the ways of our God, to fear His name, to stand in awe of and to revere His name. To bring Him praise with all our hearts, not just a lip service, and to glorify His name forever. Such is the nature of God's love and deliverance.

It's these deep desires stirred by the love of God that brought David to his knees, crying out to God: "Teach me your way, O Lord, and I will walk in your truth; give me an undivided heart, that I may fear your name," (Psalm 86:11).

Christian friends, consider the depth and riches of His love for you and as you do so may you too be brought to that

glorious place of complete and utter devotion to God. May your heart desire to exercise reverence and honour to God,

to be single in its purpose to enjoy and please God.

How wonderful it is to know that God's love for us is

personal and eternal in Jesus Christ. Amen.

*Dirk Coetzee, Pastor of the Grahamstown*



## ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

### PUBLIC REVIEW OF DRAFT SCOPING REPORT PROPOSED PLAN 8 GRAHAMSTOWN WIND ENERGY PROJECT, EASTERN CAPE, SOUTH AFRICA

DEA REFERENCE NUMBER: 12/12/20/2523

Notice is given in terms of regulation 54(2) as published in the Government Gazette No 543 Environmental Impact Assessment (EIA) regulations of the National Environmental Management Act (Act No 107 of 1998) for intent to undertake an Environmental Impact Assessment, as governed by GN 545.

Plan 8 (Pty) Ltd □ a renewable energy company, plans to develop a wind power generation facility (known as a □windfarm□) 30km outside of Grahamstown, towards East London, along the N2 located in the Makana Municipality in the Eastern Cape Province of South Africa. The proposed project is planned to host up to 32 turbines, each with a nominal output ranging between 2-3MW. The total potential output of the windfarm would be 80MW.

All Interested and Affected Parties are hereby notified of the availability of the Draft Scoping Report (DSR) for public review and comment. The required 40 day review period is from 3 November 2011 to 13 December 2011. Copies of the DSR are available for review and comment at the following locations:

- Grahamstown Main Public Library
- The CES website ([www.cesnet.co.za](http://www.cesnet.co.za)) □ click on the □Public Documents□


All Interested and Affected Parties and members of the public are invited to attend the public meeting on **14 November 2011 at 18h00 at the Graham Hotel Conference Venue, Grahamstown**. The findings of the DSR report will be presented to attendees, followed by a general discussion.

For further information and submission of comments, please do not hesitate to contact: Mr Thomas King, P.O. Box 934, Grahamstown 6140. Tel: 046-822 2384; Fax: 046-8228564 Email: [t.king@cesnet.co.za](mailto:t.king@cesnet.co.za).

Visit  
[www.grocotts.co.za](http://www.grocotts.co.za)

**18 Thursday April 26, 2012**

**ENVIRONMENTAL IMPACT ASSESSMENT PROCESS**



**PROPOSED DEVELOPMENT OF THE PLAN 8 GRAHAMSTOWN WIND ENERGY PROJECT**

Notice is given in terms of regulation 54(2) as published in the Government Gazette No 543 Environmental Impact Assessment (EIA) Regulations of the National Environmental Management Act (Act No 107 of 1998) for intent to undertake an EIA.

Plan 8 (Pty) Ltd is proposing to construct a Wind Energy Project to be developed outside of Grahamstown, along the N2 freeway, in the Eastern Cape Province of South Africa. The proposed project will entail the construction and operation of up to 33 turbines each generating 2-3 MW of power with a total capacity of 80MW. The proposed development will cover an area of approximately 2,550 hectares.

All Interested and Affected Parties (I&APs) are hereby notified of the availability of the Draft Environmental Impact Report for public review and comment. The 40 day review period is from **26 April 2012 to 6 June 2012**.

Copies of the **Draft Environmental Impact Report (DEIR)** are available for review and comment at the following locations:

- > Grahamstown Library
- > The CES website ([www.cesnet.co.za](http://www.cesnet.co.za)) – click on the public documents.

**A public meeting will be held at the Graham Hotel on 17 May 2012 at 6pm for release of the DEIR and for IAPs to raise any issues and/or concerns**

For further information and submission of comments, please do not hesitate to contact: Mr. Anton Hough, P. O. Box 934, Grahamstown, 6140.  
Tel: 046-622 2364; Fax: 046-622 6564 Email: [a.hough@cesnet.co.za](mailto:a.hough@cesnet.co.za).

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...less they are drunk and then they talk about it badly."

## ENVIRONMENTAL IMPACT ASSESSMENT PROCESS



### PROPOSED DEVELOPMENT OF THE PLAN 8 GRAHAMSTOWN WIND ENERGY PROJECT

Notice is given in terms of regulation 54(2) as published in the Government Gazette No 543 Environmental Impact Assessment (EIA) regulations of the National Environmental Management Act (Act No 107 of 1998) for intent to undertake an EIA

Plan 8 (Pty) Ltd is proposing to construct a Wind Energy Project to be developed outside of Grahamstown, along the N2 freeway, in the Eastern Cape Province of South Africa. The proposed project will entail the construction and operation of up to 33 turbines each generating 2-3 MW of power with a total capacity of 80MW. The proposed development will cover an area of approximately 2,550 hectares.

All Interested and Affected Parties (I&APs) are hereby notified of the availability of the Draft Environmental Impact Report for public review and comment. The 40 day review period is from **26 April 2012 to 6 June 2012**.

Copies of the **Draft Environmental Impact Report (DEIR)** are available for review and comment at the following locations:

- Grahamstown Library
- The CES website ([www.cesnet.co.za](http://www.cesnet.co.za)) – click on the public documents.

**A public meeting will be held at the Graham Hotel on 17 May 2012 at 6pm for release of the DEIR and for IAPs to raise any issues and/or concerns**

For further information and submission of comments, please do not hesitate to contact: Mr. Anton Hough, P. O. Box 934, Grahamstown, 6140.  
Tel: 046-622 2364; Fax: 046-622 6564 Email: [a.hough@cesnet.co.za](mailto:a.hough@cesnet.co.za).



**MAKANA**  
MUNICIPALITY | EASTERN CAPE  
...a great place to be



**200 YEARS**  
reflect and imagine  
...the making of a great place to be

### CORRECTION OF NOTICE NUMBER 37/2012

#### REZONING APPLICATION: WAAINEK WIND ENERGY FACILITY, GRAHAMSTOWN

Notice is hereby given that Makana Municipality has received an application in terms of the Land Use Planning Ordinance, 15 of 1985 for the rezoning of wind turbine tower footprints to Special Zone: Wind Turbine; for building line relaxations; for temporary departure to permit project construction and matters incidental thereto and for the creation of lease and servitude areas to permit the construction and operation of the proposed Waainek Wind Energy Facility near Grahamstown, Eastern Cape Province.

The application was received from Fridlaender, Burger and Volkmann, Professional Land Surveyors on behalf of Innowind (Pty) in respect of **PORTION 1 (STROWAN) OF THE FARM ZYFER FONTEIN, NO. 249, PORTION 15 (STROWAN) OF FARM NO. 253, PORTION 8 (FANCUTTRS) OF FARM NO. 253, PORTION 17 (COLDSPRING ANNEXE) OF FARM NO. 253 AND PORTION 21 OF FARM NO. 253** situated near Grahamstown in the Makana Municipality, Administrative District Albany, Province of Eastern Cape.

Further particulars of this application may be obtained during office hours from the **DIRECTORATE: TECHNICAL AND INFRASTRUCTURAL SERVICES, MAKANA MUNICIPALITY, GRAHAMSTOWN**.

Any person wishing to submit comment or objection in respect of the application must do so in writing to the **MUNICIPAL MANAGER, P.O. BOX 176, GRAHAMSTOWN, 6140** on or before **04 May 2012**.

**MS. N.L. BAART**  
**MUNICIPAL MANAGER**

REFERENCE NUMBER: C/PTNS1/8/15/17/21 Albany

**APPENDIX D-5: COPY OF SITE NOTICE TEXT AND PHOTOGRAPHS PLACED AT THE ENTRANCE TO EACH FARM (THE FARMS GILEAD, TOWER HILL AND PEYNES) NOTIFYING I&APS OF THE PROPOSED PLAN 8 GRAHAMSTOWN WIND ENERGY PROJECT**

**PROPOSED DEVELOPMENT OF THE PLAN 8 GRAHAMSTOWN WIND ENERGY PROJECT IN THE EASTERN CAPE PROVINCE**

**NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT PROCESS**

Notice is given in terms of Regulation 54 of the Environmental Impact Assessment (EIA) Regulations published in Government Notice R543 in Government Gazette No 33306 of 02 August 2010, under Section 24(5) of the National Environmental Management Act 1998 (Act No 107 of 1998), as amended, that a wind energy project is proposed for construction at Farms Gilead, Tower Hill and Peynes Kraal, Grahamstown in the Makana Municipality in the Eastern Cape Province.

The proposed project will entail the construction and operation of up to 32 turbines each generating 2.5MW of power with a total generation capacity of ~ 80MW.

In terms of the EIA regulations, the proposed development will require a full scoping and Environmental Impact Assessment (EIA). Plan 8 (Pty) Limited has appointed Coastal and Environmental Services (CES) to undertake the EIA. The application has been submitted to the Department of Environmental Affairs (DEA).

If you have any comments or queries, or if you require further information, please contact  
Mr. Hylton Newcombe at:-  
Tel: 046 622 2364; or Fax: 046 622 6564; or Email:  
h.newcombe@cesnet.co.za





Plate D5 – 1: Site notice erected at the entrance to the Farm Gilead. GPS co-ordinates (33.282154 S; 26.83058 E)



Plate D5 – 2: Site notice erected at the entrance to the Farm Tower Hill. GPS co-ordinates (33.285775 S; 26.862073 E)





Plate D5 – 3: Site notice erected at the entrance to the Farm Peynes. GPS co-ordinates (33.283142 S; 26.847159 E)

APPENDIX D-6: ATTENDANCE REGISTER FROM THE PUBLIC MEETING HELD AT THE GRAHAM HOTEL, GRAHAMSTOWN



ATTENDANCE REGISTER

Plan 8 Grahamstown Wind Energy Project (Environmental Impact Assessment – Scoping Phase): Public Meeting, Grahamstown, Graham Hotel  
 Conference Venue - 14 November 2011, 18h00.

NAME	POSTAL ADDRESS	TELEPHONE	FAX	CONTACT	
				CELL PHONE	EMAIL
P. de Klerk	Box 160 6447	0828095425	046-6223118		ponie@chubb-b-dewillies.co.za
K. McCrows	P.O. Box 362 GHT	046 6228171	046 6228171		
O. CROUSE	Box 362 GHT	0826609974	046 6228474		
G.L. DIXON	P.O. Box 6272	046 6227776 0727641303		0727641303	claypits@geenet.co.za
G.B. DIXON	P.O. Box 6292	046 6227758 0847675097	0866975204	0847675097	gbd@geenet.co.za
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M.S. Enwee	P.O. Box 621	0823007730	046 6360011	0823007730	jmicheaux@zazu.co.za
MS Miller				0825921664	
P. MINI	40 HIGH STREET	046 622 7222	-	-	p.mini@grocotts.co.za
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R. COOPER		046 622 5153 082747188			robert@terra-power.co.za
Z. JESSA	105 NEW CHURCH ST. - CAPE TOWN				Zuber.Jessa@Harv-B.co.za



**ATTENDANCE REGISTER**

Plan 8 Grahamstown Wind Energy Project (Environmental Impact Assessment – Scoping Phase): Public Meeting, Grahamstown, Graham Hotel  
 Conference Venue - 14 November 2011, 18h00.

NAME	POSTAL ADDRESS	TELEPHONE	CONTACT		
			FAX	CELL PHONE	EMAIL
Elbrecht Oswald		086637063			elbrechtoswald@gmail.com oswald@northerncoastline.com
Jason Core	Box 3804 C.T. 8000	cell 8117272		4-	jason.copelplan@ec.co.za

**APPENDIX D-6: PHOTOGRAPHS OF THE PUBLIC MEETING HELD AT THE GRAHAM HOTEL, GRAHAMSTOWN**



**APPENDIX D-7: MINUTES OF THE PUBLIC MEETING HELD AT THE GRAHAM HOTEL, GRAHAMSTOWN**

**Infinite Plan 8 Grahamstown Windfarm  
Public meeting, Graham Hotel, Grahamstown, Monday 14th November 2011  
Comments & responses**

Mr P de Klerk	
Ms KM Crous	Neighbouring farmer
Mr O Crous	
Mr GL Dixon	Chair of the Coombes Agricultural Association
Mr GB Dixon	
Mr WL Nortje	
Mr MJ Erwee	
Mr MS Miller	
Ms P Mini	Grocotts Mail
Ms J Gon	
Mr R Cooper	
Mr Z Jessa	Infinite Plan 8 (IP8)
Mr J Cope	Infinite Plan 8 (IP8)
Mr A Oswald	Nordex
Mr H Newcombe	Coastal & Environmental Services, Ght (CES)
Mr W Rowlston	Coastal & Environmental Services, Ght

<b>Comment: Ms P Mini</b>
I've heard there is a wind farm planned for the Grahamstown industrial area: is this the one we're discussing.
<b>Response: CES</b>
No: the one we're discussing here is planned for a site about 30km east of Grahamstown, near the N@ towards Peddie and East London
<b>Comment: Mr O Crous</b>
There is a group of three turbines at the north side of the project area, and these will have a bigger visual impact than the others. How certain is it that these turbines will be constructed?
<b>Response: IP8</b>
All the turbine locations are preliminary at the moment, but these three sites are more difficult to access than the others. Although the modelling showed that the turbine positions make best use of the wind energy on the site, there are many factors that influence the siting of the turbines, including topography, contours, the distance between each turbine, as well as environmental and social considerations such as visual impacts..
<b>Comment: Mr O Crous</b>
Is it correct that the distance of a turbine from a property boundary should be 1.5 times the height to the hub?
<b>Response: IP8</b>
Guidelines have been developed only recently, and are region specific. Turbines cannot be on a property boundary, and 200m seems to be a reasonable distance.
<b>Comment: Mr O Crous</b>
How far is the nearest turbine from the nearest occupied dwelling?
<b>Response: IP8</b>
It is not possible to tell whether a property is occupied or not from maps, and this will have to be confirmed on site. A distance of 500m between a turbine and an occupied property is commonly adopted to reduce the visual impacts and the effects of noise and flicker.
<b>Comment: Mr O Crous</b>
The site seems to have been chosen from the developer's point of view. Surely there are better sites from a wind point of view.
<b>Response: IP8</b>
This is a fair point, but this site has many advantages, including good wind resources, relatively low wind turbulence, access to turbine sites, low density of habitation and proximity of a 132kV power line, There are other good sites closer to Grahamstown, but the density of structures and population is higher.
<b>Comment: Mr O Crous</b>
What does the data from the meteorological mast tell you so far?
<b>Response: IP8</b>



Only a few weeks' data have been collected thus far, but the average wind speed appears to be more than 8m/sec. We have to collect one year's data in order to submit our bid.
<b>Comment: Mr O Crous</b>
At my house the prevailing wind direction is south west.
<b>Response: IP8</b>
The meteorological mast has been set up to obtain more detail on the wind regime on the site, as the grid used in the modelling is quite coarse. Thus far insufficient wind data has been collected to determine the prevailing wind direction or to detect seasonal variations
<b>Comment: Mr O Crous</b>
There is a possibility that the N2 may be realigned in this area.
<b>Response: CES</b>
Thank you: we will investigate this with SANRAL
<b>Comment: Mr GL Dixon</b>
If the wind farm goes ahead the surrounding community must get used to its presence, and they will in time. However, some farmers will benefit directly from the wind farm, while others won't. How will the others be compensated, on properties where ecotourism or hunting lodges either operate or might in the future, for instance?
<b>Response: IP8</b>
One of the conditions attached to the bid for a wind farm is that 2% ownership of the project to belong to the community, but how this is to be achieved is not specified in detail. Job opportunities must also be available to local people. We will be talking to community representatives to determine how best to satisfy this condition, and also to find out where game and ecotourism lodges are situated in the site and the surrounding areas, and other operations that might be affected by the wind farm. We will be very happy if you, your association, and neighbouring property owners can provide us with information of this sort.
<b>Comment: Mr GL Dixon</b>
How will this 2% ownership work?
<b>Response: IP8</b>
As we mentioned previously, we will work out the details in discussion with all affected communities and individuals. We must also get inputs from our bidding partners, including the turbine suppliers and the construction contractor.
<b>Comment: Mr O Crous</b>
What does 2% mean? 2% of what, and when will this be clarified.
<b>Response: IP8</b>
We believe it's 2% of turnover, but this isn't very clear in the bid documentation. We will make it as clear as we are able when we liaise with the local communities, and we have a better idea of what form it should take.
<b>Comment: Mr GL Dixon</b>
Mr Krous owns a game lodge, and I don't understand why he hasn't said as much.
<b>Response: Mr O Crous</b>
The occupant of the lodge was unable to be here, and I don't want to speak on his behalf.
<b>Comment: Mr O Crous</b>
Will the turbines be lit in any way? The warning light on the cellphone tower is visible from my property, which is just west of the boundary of the site.
<b>Response: IP8, Nordex, CES</b>
Yes: each tower must display a red flashing warning light on the nacelle at night. Illumination is horizontal and upwards, and not downwards to minimise light pollution at ground level. The extent of visibility, during the day and the night, will be determined by the visual impact study that will be undertaken as part of the EIA phase of the environmental assessment.
<b>Comment: Mr GL Dixon</b>
I'm speaking on behalf of the Coombes Agricultural Association, and i will inform the members what has been discussed this evening. We have no problem with the financial benefits that the farmers on whose land the turbines will be sited, but others might be disadvantaged. We don't know what effect the windfarm will have on property values, and we don't know what effect it will have on visitors to farms that might go to game farming.
<b>Response: CES</b>
The socio-economic impacts of windfarms are very difficult to determine, because some people think they are attractive and indicate a commitment to renewable energy, while others think they are unattractive. Nevertheless, all comments on the proposed Infinite Plan 8 Wind Farm will be communicated to the regulatory authority as completely and as accurately as possible.
<b>Comment: Mr GL Dixon</b>
So as to spread the benefits wider I suggest that consideration be given to moving turbines sited near to farm boundaries into the next farm. Will Eskom consider giving neighbouring farmers a discount on their electricity

accounts?
<b>Response: IP8, CES</b>
These are interesting proposal, and we will consider them, but it is doubtful if Eskom will agree to such a proposal.
<b>Comment: Ms P Mini</b>
The planned output from the windfarm is 80MW. But what does this mean?
<b>Response: IP8, Nordex</b>
In very rough terms 80MW is sufficient to provide power to about 6 000 middle-class homes.
<b>Comment: Mr P de Klerk</b>
Do the turbines pose a fire hazard?
<b>Response: Nordex</b>
The turbines are fitted with many safety features, including automatic control equipment and fire extinguishers, to safeguard against fires and other malfunctions. The risk of fire is very slight, and Nordex has never experienced a fire in any of its turbines.
<b>Comment: Mr O Crous</b>
Could you explain the bid process in more detail? Is it competitive?
<b>Response: IP8</b>
The bid process is competitive. It is adjudicated by the Department of Energy (DoE). The success of a bid depends, among other things, on the feed in tariff offered by the bidder – the unit price of electricity to be supplied into the national grid, but there are many other factors considered in reviewing bids. The ceiling tariff prescribed by DoE is currently R 1.15 per kilowatt hour. We will try to make further information available to all interested persons on the subject.

**APPENDIX D-8: COMMENTS REPORT (ISSUES AND RESPONSE TRAIL) AS IT STANDS ON 25 JULY 2012 INCORPORATING COMMENTS SINCE THE START OF THE SCOPING PHASE AND FOLLOWING RELEASE OF THE DRAFT SCOPING REPORT –COPIES OF ALL COMMENTS RECEIVED FOLLOWING RELEASE OF THE DRAFT SCOPING REPORT HAVE ALSO BEEN INCLUDED IN THIS APPENDIX.**

NAME	ISSUE	DATE	RESPONSE
<b>1. GENERAL</b>			
O. Crous: (Neighbouring Landowner, Mr Pumzo Mdleleni: Vodacom)	The project must not negatively affect television, cell phone, and Telkom landline or internet reception.	12/12/2011 Email	The turbines don't have any effect on cellular phone signal and reception; however there may be minimal interference with other electronic devices if turbines are placed too closely to the Vodacom Mast.
Fred Pittaway (Cattle and game farmer and project neighbour)	Wind power not only has the advantage of being a clean energy source but another added bonus is that the energy source is free and inexhaustible	22/05/2012 Written	Noted.
O. Crous Neighbouring Landowner	Specialist report – Diagram 7.1 – Table 15 – Figure 2, locality. Are the tables not supposed to be turned around?	17/05/2012 Via Public Meeting	This has been corrected.
Gavin Dixon	The layout of the boundaries is incorrect	17/05/2012 Via Public meeting	These boundaries are demarcated by the surveyor general on a nationwide scale. This is the most accurate available to us. Please provide additional information if possible.
Dave Young	Concerned that he wasn't informed of the project  Wants a specialist report done on the devaluation of the property as a result of the wind farm and raised concerns that the assessment is flawed as it didn't include a specialist report on the impact on the property price	06/06/2012 Via Public meeting	We would sincerely like to apologise for this oversight, however the EAP is only required by law to inform, in writing, all immediate surrounding landowners and landowners within 100m of the project site (GNR 543 (54)). Furthermore, the project and details of the public meetings were advertised in a regional and local newspaper, inviting I&AP's to register. Site notices were also placed on the borders of the properties involved.  In addition to this the proposed wind farm was on the

NAME	ISSUE	DATE	RESPONSE
			<p>agenda of the Coombs Agricultural Association meetings on January the 23<sup>rd</sup> and April the 25<sup>th</sup>. You were sent the agenda for these meetings, indicating that this would be discussed, prior to the public meeting being held. Therefore it can be said that every attempt was made to notify potential I&amp;APs and no one person was excluded intentionally.</p> <p>It is difficult to measure the impact of wind farm developments on property prices in an objective manner, since there is currently very few of these developments in South Africa and therefore no one actually knows what the impact will be. It was felt that without sufficient information available for such a study it would be frivolous.</p>
Peter Moll and Adri Timm	Concerned that they did not have copies of the EIR.	06/06/2012 Via Public meeting	These can be viewed on the CES website, or viewed in hard copy at the Grahamstown public library. The EAP will happily email you a link to the EIR should this be asked for. Should you be unable to obtain the EIR from these various locations please let us know which will be the easiest way for you to obtain the document.
<b>2. PROCEDURAL</b>			
Murray Crous Settlers Safaris/Honeykop Lodge	<p>The developers did not approach the affected neighbours of the project in order to reduce the negative impacts of this project.</p> <p>From our lodge the proposed wind turbines will be in view, which will put off many hunters and thus we will suffer financially.</p>	14/12/2011 Email	It is difficult to measure the impact of wind farm developments on property prices in an objective manner, since there is currently very few of these developments in South Africa and therefore no one actually knows what the impact will be.
Murray Crous Settlers Safaris/Honeykop Lodge	Letters were sent to farms closer than 1 km to the site, since then the amount of turbines and their numbering have changed. No follow up has taken	04/06/2012 Email	CES guarantees that all reports we produce will display the most up-to-date turbine and infrastructure layout. The draft EIR displayed a turbine layout that

NAME	ISSUE	DATE	RESPONSE
	<p>place causing the affected parties not to be up to date as to the extent of the effects to their property. See graphs in Noise impact assessment.</p>		<p>was subject to specialist assessment. Some of the turbines in this layout infringed on sensitive areas. On the 11<sup>th</sup> of July 2012, a new layout was developed that took account for these sensitive areas.</p> <p>This layout will be shown in the Final EIR. This will be available for review on the CES website. I&amp;APs can then submit their concerns on that layout directly to the DEA case officer.</p>
<p>Murray Crous Settlers Safaris/Honeykop Lodge</p>	<p>Adverts were placed in Grocotts mail. I think it is unfair to affected parties that don't read Grocotts mail or live outside the distribution area of this local newspaper. These notifications were vague mentioning a site along the N2, which could be anywhere and were most likely mistaken for the 'Waainek' site.</p>	<p>04/06/2012 Email</p>	<p>This is regrettable. The name of the developer, Plan 8, would have been displayed on the advert. The Waainek Wind Farm is being developed by InnoWind. The output of the two projects is different, and the output of the proposed Plan 8 Wind Farm would have been displayed on the advert..</p>
<p>Dave De La Harpe Director of Amaraka Investments No. 6 (Pty) Limited</p>	<p>Notwithstanding the fact that I am a regular reader of all local newspapers this proposal had not come to my attention.</p>	<p>14/12/2011 via email</p>	<p>The proposed wind farm was on the agenda of the Coombs Agricultural Association meetings on January the 23<sup>rd</sup> and April the 25<sup>th</sup>. You were sent the agenda for these meetings, indicating that this would be discussed, prior to these meeting being held. We regret that this was not the case. A copy of these adverts that appeared in these newspapers can be viewed in the final EIR.</p>
<p>Mr Pieter de Villiers Moll Landowner (Trumpeters Drift Farm 612)</p>	<p>Some of the farmers do not have access to newspapers such as the Grocotts and EP Herald, and are therefore not informed about the proposed project. According to Mr de Villiers Moll, no solitary farmer or game rancher in the Fish River Valley was aware of the proposed project</p>	<p>10/06/2012 Written</p>	<p>We regret this, but the best reasonable effort was made. Site notices were erected, the project was advertised, and we also rely to a certain extent on word of mouth. To facilitate this, the proposed wind farm was on the agenda of the Coombs Agricultural Association meetings on January the 23<sup>rd</sup> and April the 25<sup>th</sup>. You were sent the agenda for these meetings, indicating that this would be discussed, prior to these meeting being held.</p>



NAME	ISSUE	DATE	RESPONSE
			A public participation process, including newspaper advertisements, letters of notification and public meetings, were held in line with GNR 543 of the National Environmental Management Act.
Mr Pieter de Villiers Moll Landowner (Trumpeters Drift Farm 612)	No notification board was erected at the junction of the N2 and the Committees Drift Road or the Fort Beaufort and Committees Drift Road.	10/06/2012 Written	That junction is very far from the site. Erecting a notice there will have been misleading as to the location of the project. The notices were erected along the borders of the property, in line with regulation 54 (2) of NEMA.
<b>3. TOURISM AND BUSINESS OPERATIONS</b>			
Murray Crous, Petra Schutrops (Neighbouring Landowner - Bushmans Gorge Lodge and Settlers Safaris hunting outfit)	The area will be spoiled for hunting purposes.	12/12/2011	It is likely that some of your clients will find these structures unpleasant, but we have no knowledge of how many may not be bothered by them. It is a matter of people's opinions and perceptions. Without a detailed, nationwide study, this concern cannot be adequately addressed. We regret that this is the case. There is currently no evidence to suggest this due to the fact that there are currently very few wind farms in South Africa.  A viewshed analysis conducted during the visual specialist study shows all the areas from which turbines will be visible. This is displayed as figure 6.1 in the report.
O. Crous (Neighbouring Landowner)	Has any research been done on the long-term breeding patterns of wild game within a distance of one kilometre of a forest of wind turbines? We are breeders of rare and expensive species of game.  I feel strongly that it should not be just the landowners on whose property the turbines are going to be erected to gain financially from the	12/12/2011 via email	These comments have been noted and incorporated in to the EIR. CES has motivated to the national Department of Environmental Affairs that an SEA be undertaken to better guide and manage wind farm EIA's in the country.

NAME	ISSUE	DATE	RESPONSE
	<p>project, but the surrounding landowners who have got to suffer the effects of the wind turbines. Spoiling landscape, noise, lights, loss of business from hunting lodge, decreased property value etc.</p> <p>Regarding above point, I want to see the Coombs Agricultural Association being involved. This association being for the benefit of the farmers in this area as well as the farm workers and their families</p>		
<p>Dave De La Harpe A director of Amaraka Investments No. 6 (Pty) Limited (the owner of the farm properties Stoneyvale, Governor's Kop, Uniondale and the Orchards)</p>	<p>The construction of a substantial Windfarm on the high lying ridge above Coombes Valley will impact negatively on all eco-tourism and hunting concerns in the vicinity and in particular to Amaraka Investments No. 6 (Pty) Limited.</p>	<p>14/12/2011 via email</p>	<p>CES has motivated to the national Department of Environmental Affairs that an SEA be undertaken to better guide and manage wind farm EIA's in the country.</p> <p>See above response in terms of hunting and tourism</p>
<p>Murray Crous , Petra Schutrops (Neighbouring Landowner of Bushmans Gorge Lodge and Settlers Safaris hunting outfit)</p>	<p>We breed expensive and rare animals such as Black Impala, Golden Wildebeest, Copper Blesbuck and we are worried that the disturbance of this project will affect there breeding behaviour and the game populations greatly.</p> <p>This plan as it is will only benefit the farmers that supply the land and the companies involved in erecting the turbines and all the other neighbours will have to suffer the negative environmental as well as financial consequences of this plan.</p> <p>Our outfit caters for foreign hunters and non-hunters who wish to spend their holidays in a natural untouched environment. From our lodge the proposed wind turbines will be in view, which will put off many hunters and thus we will suffer financially.</p>	<p>14/12/2011 via email</p>	<p>These comments have been noted and incorporated in to the EIR. CES has motivated to the national Department of Environmental Affairs that an SEA be undertaken to better guide and manage wind farm EIA's in the country.</p>
		<p>14/12/2011</p>	

NAME	ISSUE	DATE	RESPONSE
<p>Dave De La Harpe Director of Amaraka Investments No. 6 (Pty) Limited (the owner of the farm properties Stoneyvale, Governor's Kop, Uniondale and the Orchards)</p>	<p>A development of a Windfarm on this particular site, no matter how attractive it may be to the Developer and the Landowners will adversely impact upon other legitimate land-users and in particular Amaraka Investments No. 6 (Pty) Limited in that the visual pollution will be considerable and will in all probability make it more difficult if not impossible to sell eco tourism and safari operations on its property and will most certainly reduce the value of its considerable investment in land.</p>	<p>via email</p>	<p>It is likely that some of your clients will find these structures unpleasant, but we have no knowledge of how many may not be bothered by them. It is a matter of people's opinions and perceptions. Without a detailed, nationwide study, this concern cannot be adequately addressed. We regret that this is the case. There is currently no evidence to suggest this due to the fact that there are currently very few wind farms in South Africa.</p> <p>A viewshed analysis conducted during the visual specialist study shows all the areas from which turbines will be visible. This is displayed as figure 6.1 in the report.</p>
<p>A Timm Huntshoek Lodge cc Edcot Trust t/a Huntshoek Safaris</p>	<p>The impact on game farms and tourism most definitely would be a negative one, as we rely extensively on the pristine beauty and untouched landscapes to attract visitors to our area and should these wind turbines mar this picture, which it will, visitors to most of the game farms and lodges in this area will drastically decline as no one wants to sit and watch noisy wind turbines whilst they paid to come and experience nature.</p>	<p>04/06/2012 Written</p>	<p>These comments are noted.</p> <p>A person cannot hear a wind turbine beyond a distance of 500 meters, unless the turbine is functioning incorrectly. Plans will be in place to ensure that these situations are dealt with timeously.</p> <p>To try and better understand the impacts of wind turbine developments on tourism, CES has motivated to the national Department of Environmental Affairs that an SEA be undertaken to better guide and manage wind farm EIA's in the country.</p>
<p>Murray Crous Settlers Safaris/Honeykop Lodge</p>	<p>I reside and conduct my business Settlers Safaris from the farm Honeykop directly adjacent to the proposed site with the closest proposed turbine at 532 meters.</p>	<p>10/06/2012 Email</p>	<p>This concern is noted.</p>
<p>Murray Crous Settlers Safaris/Honeykop Lodge</p>	<p>My main concern is the loss of income I am expecting to incur. It makes me very concerned for my livelihood as well as the livelihood of my workers.</p>	<p>10/06/2012 Written</p>	<p>This concern is noted. The impacts, positive or negative, of wind turbine developments on tourism in South Africa remains untested.</p>

NAME	ISSUE	DATE	RESPONSE
K. Rawson, N. Rudy, O. Crous Owners of The Hills Game Estate	It will not only affect our business negatively, but the future land value of the property negatively. This area is mostly game farming orientated, of great historical background around the Great Fish River and must not be intruded upon by landscape changing turbines.	10/06/2012 Email	This concern is noted.
Gavin Dixon	Some farmers will benefit directly from the wind farm, while others won't. How will the others be compensated, on properties where ecotourism or hunting lodges either operate or might in the future, for instance?	14/11/2011 Public Meeting	As part of the IPP procurement programme, under the authority of the Department of Energy, 2% of the project must belong to the community, but how this is to be achieved is not specified in detail. Job opportunities must also be available to local people. We will be talking to community representatives to determine how best to satisfy this condition, and also to find out where game and ecotourism lodges are situated in the site and the surrounding areas, and other operations that might be affected by the wind farm. We will be very happy if you, your association, and neighbouring property owners can provide us with information of this sort.
<b>4. VISUAL</b>			
Mr O. Crous Neighbouring Landowner	Any lights on structures must shine up into the sky and not sideways or downwards.  Painting of structures to blend in with sky and surrounding countryside, not plain white colour.  What is the distance from the nearest turbine to my homestead or boundary and how many would be erected?	12/12/2011 via email	Noted. A visual specialist study has been undertaken during the EIR phase of the project.
Murray Crous, Petra Schutrops (Neighbouring Landowner of Bushmans Gorge Lodge and	The N2 between Grahamstown and Peddie is already a very dangerous stretch of road, this can	14/12/2011	

NAME	ISSUE	DATE	RESPONSE
Settlers Safaris hunting outfit)	be seen in the amount of accidents and fatalities. Erecting turbines visible from the N2 will distract the drivers' attention and cause even more accidents along this road. I presume the turbines will have signal lights on top, this will be light pollution and an eyesore in the evenings as a big part of our advertising is to be away from man made things and to be out in the bush.		
G.B.Dixon	<p>Secondly; the girl; was it Lee-Anne who did the study on vegetation; took pictures and I recognize a few of them on my farm and she speaks of over grazing and how that has affected the vegetation of the area. From my farm Gilead's perspective in the last 33 years or so I have been farming it post my father, overgrazing has not occurred.</p> <p>The recommended stocking rate to my knowledge is 1LSU to 7 ha and not 6 as was stated there.....never the less I have been running about1 LSU to 10ha which does not make cattle farming too profitable here, hence the need to make these farms more profitable by wind farming and making them more viable economically.</p>	7/5/2012 Email	Noted.
O. Crous Neighbouring Landowner	<p>Specialist visual impact report – 26km away has been scanned, but not the farm next door?</p> <p>Other farms have been included but not the farm right next door.</p>	17/05/2012 Via Public Meeting	We have submitted visual montages. We can arrange to get those to you. Whatever you need, we will do our best to get that to you.
Dave Young Director: George Building Supplies (Pty) Ltd	<p>The significance of the adverse effects of these wind turbines from a visual impact and intrusion point of view are as follows:</p> <ol style="list-style-type: none"> <li>1. The current and future value of the surrounding farms will be significantly reduced as a consequence of having to</li> </ol>	21/05/2012 Email	<ol style="list-style-type: none"> <li>1. The impact turbines will have on property values is subjective and no studies can confirm that this is the case.</li> <li>2. This is noted.</li> <li>3. This is noted.</li> </ol>



NAME	ISSUE	DATE	RESPONSE
	<p>look at these huge turbines. If anyone has any doubt as to the size of these behemoths then drive to Port Elizabeth and have a look at how just one of these monsters dominates the surrounding area. Who wants to buy or own a property looking onto this proposed scheme vs. the current bush covered rolling hills.</p> <ol style="list-style-type: none"> <li>2. Those operations dependant on hunting as a source of income will be negatively affected. Hunters, especially foreigners whom many of the farmers depend on for an income, will certainly not choose an African bush experience staring at a landscape dominated by large spinning turbines. These clients will go elsewhere.</li> <li>3. Eco tourists would far prefer to look at scenic hills rather than spinning turbines and they will also take their business elsewhere.</li> </ol>		
<p>Murray Crous Settlers Safaris/Honeykop Lodge</p>	<p>Visual pollution will be considerable and will in all probability make it more difficult if not impossible to sell eco -tourism and safari operations on its property and will most certainly reduce the value of its considerable investment in land</p>	<p>04/06/2012 Email</p>	<p>This is noted.</p>
<p>Murray Crous (Settlers Safaris/Honeykop Lodge)</p>	<p>Which buildings will experience shadow flicker? What will the shadow flicker on Honeykop lodge be like</p>	<p>10/06/2012 Email</p>	<p>This was assessed in the visual impact study, section 6.1.6. Only one farmstead, that occupied by Morne Erwee, is at risk of experiencing more than 30 hours per year or 30 minutes on the worst day. The turbine layout has been revised to prevent this.</p>
<p>Murray Crous (Settlers Safaris/Honeykop Lodge)</p>	<p>Chapter 8 Page 1 “The wind farm will be highly intrusive on the views of a number of highly sensitive viewers” What lights will be on the turbines? First meeting at</p>	<p>10/06/2012 Written</p>	<p>The lighting requirements, as required in terms of the Aviation Act, is explained in detail in section 3.2.12 of the final Scoping Report.</p>

NAME	ISSUE	DATE	RESPONSE
	Coombs hall we were told that there would be sensor lights that only come on when an aircraft is a certain distance away and at the last meeting when the question was asked, the developers couldn't answer which lights are going to used!		
XXL Game Reserve (Pty Ltd)	A concern was raised with regard to the visual impact and how this will affect the hunting industry of the area	18/06/2012	This concern is noted.
Dave Young	Raised concerns about the size and colour of the turbines and the negative visual impact.	06/06/2012 Via Public meeting	The colour and markings of turbines are determined by the Aviation Act. Please refer to section 3.2.12 of the final Scoping Report produced for this project.
<b>5. LAND USE</b>			
Fred Pittaway (Cattle and game farmer and project neighbour)	I personally feel the area on which your proposed Wind Energy Project is planned for is ideally suited for the purpose. My reason for this statement is that the natural veldt is very stony and grazing is generally of poor nature, so the economic viability of the area will be enhanced and it is perfectly situated from a wind perspective.	22/05/2012 Written	Noted.
A Timm (Huntshoek Lodge cc Edcot Trust t/a Huntshoek Safaris)	Would a project of this nature guarantee NO decrease in the value of land, or can it guarantee the increase in value of land? We fear none of the above is possible. The negative impact on investment return is great, as future investors would not want to purchase land that overlooks an "industrial area" or a farm that would not be able to benefit from tourism and hunting. Tourist and hunters would be scared off by the visual impact these monsters will have on their "African safari" and most certainly start looking at alternatives.	04/06/2012 Written	No guarantees can be made, as no similar wind farm developments exist to determine what the impact will be.

NAME	ISSUE	DATE	RESPONSE
<b>6. NOISE</b>			
O. Crous (Neighbouring Landowner)	I want to know what the noise level would be if the wind blows in the direction of my homestead	12/12/2011 via email	Noted. A noise specialist study has been undertaken during the EIR phase of the project.
Murray Crous Petra Schutrops Neighbouring Landowner of Bushmans Gorge Lodge and Settlers Safaris hunting outfit	Our lodge is only 200 meters from the boundary fence with Gillead and so the noise pollution of this project is also really bothering us, especially as the lodge is also serves as our home	14/12/2011 via email	
Dave Young Director: George Building Supplies (Pty) Ltd	<p>I am not satisfied that any studies have been undertaken as regards the noise that these turbines emit and the specific effect that that this noise has on the naturally occurring game species on Chertsey as well as the other farms in the area.</p> <p>Furthermore I have no indication as to what effect this noise will have on my introduced herds of Kudu, Eland, Nyala and Wildebeest, and whether this will affect the areas that they inhabit as well as their breeding and feeding patterns.</p> <p>I also have no indication as to what noise levels we and our guests will be exposed to on the various areas of our farm as we have not been consulted or given any information whatsoever</p>	21/05/2012 via email	The noise specialist study has identified noise sensitive areas, and has set buffers from these areas that need to be adhered to. Beyond these buffers, no noise impacts will be experienced. In terms of the impact noise levels will have on the breeding of game species, no study has assessed this.
<b>7. AVIFAUNAL</b>			
O. Crous (Neighbouring Landowner)	Has any studies been done on the affect or disruption of birds in particular protected birds of prey such as black eagles, crown eagles and martial eagles which breed around and on the properties effected by the project.	12/12/2011 via email	Avifaunal issues have been dealt with extensively during the EIR phase by an avifaunal specialist.

NAME	ISSUE	DATE	RESPONSE
Murray Crous, Petra Schutrops (Neighbouring Landowner of Bushmans Gorge Lodge and Settlers Safaris hunting outfit)	Will these turbines affect the bird life and bats in our area? A lot of our clients are bird watching enthusiasts. Protected species such as Black Eagle and Crowned Eagle nest and rear young on Gillead, one of the proposed properties for this project.	14/12/2011 via email	
Dave Young Director: George Building Supplies (Pty) Ltd	For information purposes I would be interested to hear what effects, if any, that these turbines will have on the night owls, Bustards, fledgling raptors and slow flying Knysna Louries that are common in the forested areas which occur in the immediate vicinity of some of the proposed turbines.	21/05/2012 via email	The avifaunal and bat studies have demarcated bird and bat sensitive areas that need to be excluded from development. In addition to this, a twelve month long monitoring program is under way that will make more recommendations that will reduce the impact on these species.
<b>8. SOCIAL</b>			
O. Crous Neighbouring Landowner	Regarding the 2% benefit to the community, I feel it should be benefiting the surrounding community who are affected by the project and not some distant urban community who are not affected by the project.	12/12/2011 via email	These comments have been noted and incorporated in to the EIR. CES has motivated to the national Department of Environmental Affairs that an SEA be undertaken to better guide and manage wind farm EIA's in the country.

APPENDIX D-9: COMMENTS REPORT

Windfarm : N2 - Message (HTML)

File Message

Ignore X Delete Reply Reply All Forward More Meeting Move OneNote Mark Unread Categorize Follow Up Translate Find Related Select Zoom

Delete Respond Move Actions Tags Editing Zoom

NB

From: Group Of Advocates <groupofadvocates@roundbar.co.za> Sent: Wed 2011/12/14 10:19 AM  
 To: h.newcombe@cesnet.co.za  
 Cc:  
 Subject: Windfarm : N2

Dear Sirs

I was advised by Mr Crous of a proposal to establish a Windfarm adjacent to the N2 upon properties owned by Messrs Dixon and Nortier.

Notwithstanding the fact that I am a regular reader of all local newspapers this proposal had not come to my attention.

I now write in my capacity as a Director of Amaraka Investments No. 6 (Pty) Limited which is the owner of the farm properties Stoneyvale, Governor's Kop, Uniondale and The Orchards and which trades under the name and style of fort Governor's Estate adjacent to the N2.

The Company objects to the proposal firstly on the basis that the proposal has not been adequately advertised so as to attract the attention of interested and affected parties and secondly on the basis that such information as is available (and which I have obtained from Mr Crous) is inadequate to inform interested and affected persons of what is proposed.

In general terms, however, that which is proposed, the construction of a substantial Windfarm on the high lying ridge above Coombes Valley will impact negatively on all eco tourism and hunting concerns in the vicinity and in particular to Amaraka Investments No. 6 (Pty) Limited.

The immediate area has in recent years attracted investment and development for eco tourism and hunting. The viability of all of these concerns is dependant upon the re-establishment and exploitation of a natural environment.

The Developers of the proposed Windfarm undoubtedly are motivated principally by the fact that they obtain access to land in a pristine rural environment cheaper than they obtain access to land equally suitable in areas already polluted by man.

Group Of Advocates

Connect to social networks to show profile photos and activity updates of your colleagues in Outlook. Click here to add networks.

All Items There are no items to show in this view.

12:10 PM 2012/01/13

Windfarm : N2 - Message (HTML)

File Message

Ignore X Delete Reply Reply All Forward More Meeting Move OneNote Mark Unread Categorize Follow Up Translate Find Related Select Zoom

Delete Respond Move Actions Tags Editing Zoom

NB

From: Group Of Advocates <groupofadvocates@roundbar.co.za> Sent: Wed 2011/12/14 10:19 AM  
 To: h.newcombe@cesnet.co.za  
 Cc:  
 Subject: Windfarm : N2

The Developers of the proposed Windfarm undoubtedly are motivated principally by the fact that they obtain access to land in a pristine rural environment cheaper than they obtain access to land equally suitable in areas already polluted by man.

Their commercial advantage ignores the commercial disadvantage that they visit upon all neighbours and is fundamentally inappropriate in our view.

A development of a Windfarm on this particular site, no matter how attractive it may be to the Developer and the Landowners will adversely impact upon other legitimate land-users and in particular Amaraka Investments No. 6 (Pty) Limited in that the visual pollution will be considerable and will in all probability make it more difficult if not impossible to sell eco tourism and safari operations on its property and will most certainly reduce the value of its considerable investment in land.

Would you, at your earliest convenience, provide us with a copy of the entire proposal together with all environmental impact assessments and the like that we may consider our position further and in respect whereof our rights are fully reserved?

Yours faithfully

**DAVE DE LA HARPE**

Group Of Advocates

Connect to social networks to show profile photos and activity updates of your colleagues in Outlook. Click here to add networks.

All Items There are no items to show in this view.

12:10 PM 2012/01/13



O. Crous  
Honeykop Farm  
Grahamstown  
6140  
Fax 046 6228474  
cell 0826609974  
12/12/2011

Hylton Newcombe  
CES  
67 African Street, Grahamstown  
6140

Concerns Re: Plan 8 Wind Energy Project Ref 12/12/20/2523

As a neighbouring landowner (farm no. 361 and 362) of the above wind energy project, I wish to make my concerns known and taken note of.

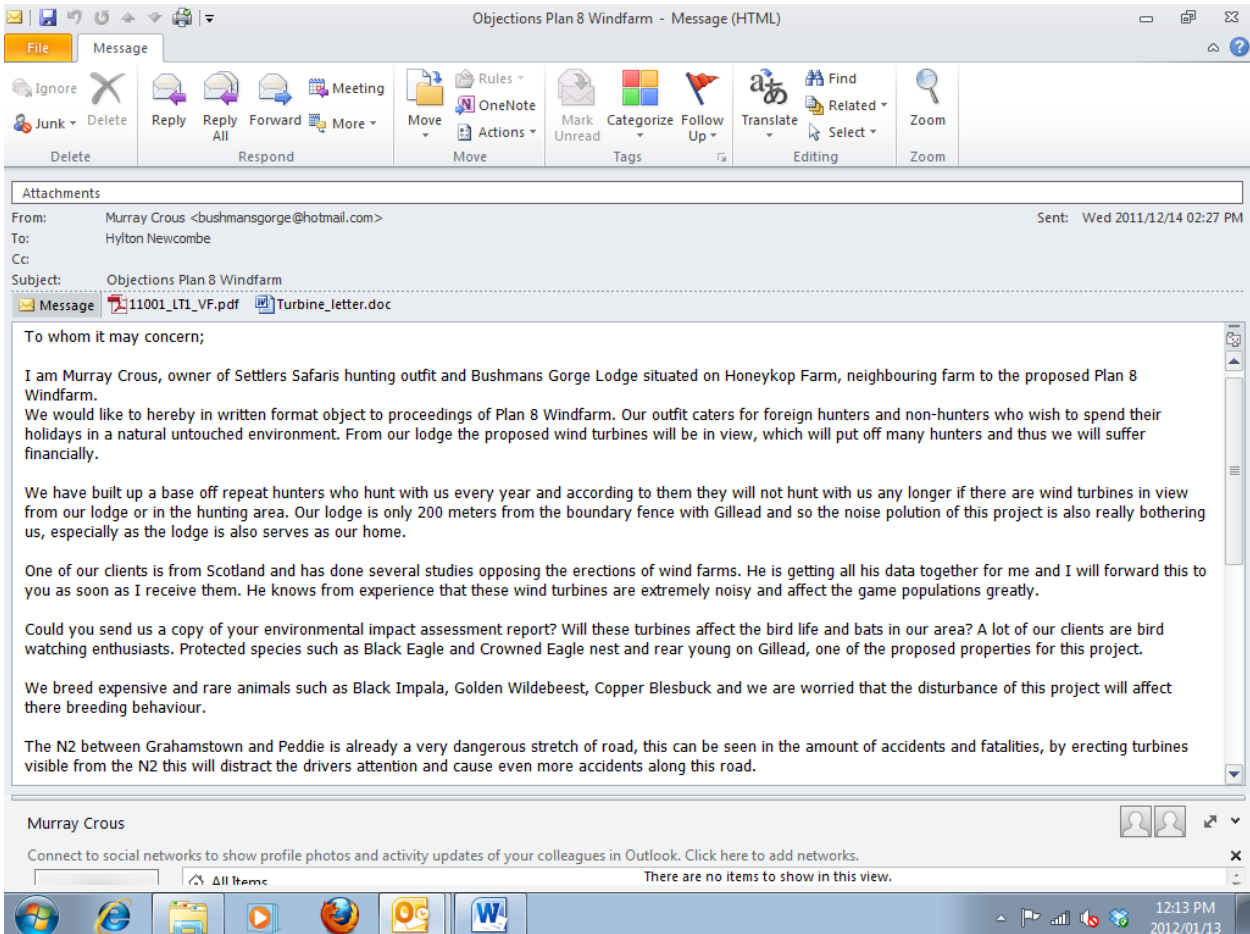
1. Any lights on structures to shine up into the sky and not sideways or downwards
2. Painting of structures to blend in with sky and surrounding countryside, not plain white colour.
3. I want to know what the noise level would be if the wind blows in the direction of my homestead.
4. What is the distance from the nearest turbine to my homestead or boundary and how many would be seen from the homestead?
5. The project must not negatively affect television, cell phone, Telkom landline or internet reception.
6. Has any research been done on the long-term breeding patterns of wild game within a distance of one kilometre of a forest of wind turbines? We are breeders of rare and expensive species of game.
7. Has any studies been done on the affect or disruption of birds in particular protected birds of prey such as black eagles, crown eagles and martial eagles which breed around and on the properties effected by the project.
8. I feel strongly that it should not be just the landowners on whose property the turbines are going to be erected to gain financially from the project, but the surrounding landowners who have got to suffer the effects of the wind turbines. Spoiling landscape, noise, lights, loss of business from hunting lodge, decreased property value etc.

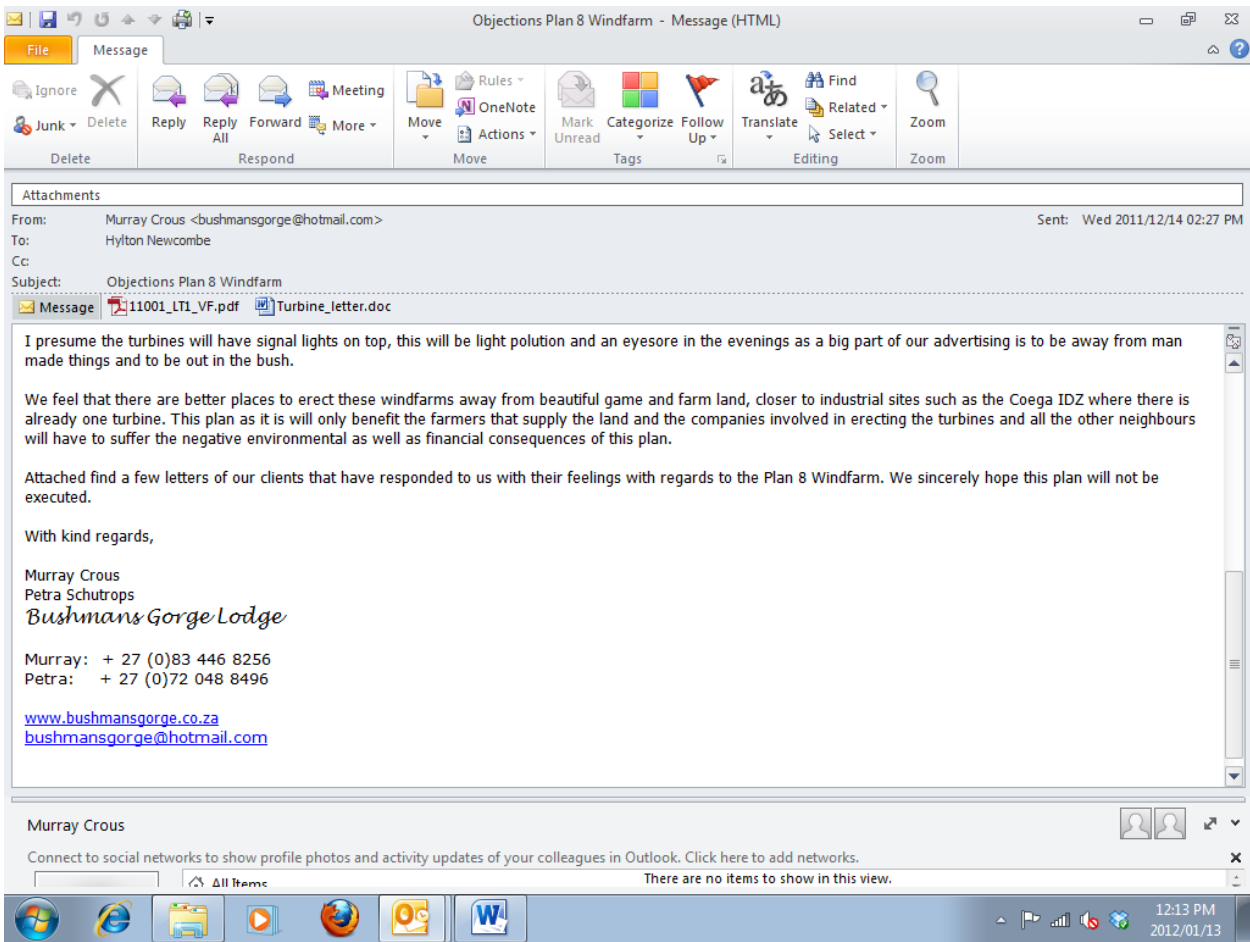
- 9. Regarding the 2% benefit to the community, I feel it should be benefiting the surrounding community who are affected by the project and not some distant urban community who are not affected by the project.
- 10. Regarding above point 8, I want to see the Coombs Agricultural Association being involved. This association being for the benefit of the farmers in this area as well as the farm workers and their families.

I wish to be kept informed of meetings and discussions where my concerns would be addressed and discussed.

Yours Faithfully

.....  
O.Crous







SETTLERS  
SAFARIS

Ultimate African Hunting

MURRAY CROUS

P.O. BOX 562  
GRAHAMSTOWN, 6140  
SOUTH AFRICA  
Tel: +27 (0) 85 446 8236  
info@settlerssafaris.com  
www.settlerssafaris.com

Grahamstown, 10<sup>th</sup> of June 2012

**ATTN:** The Project Manager  
CES  
Grahamstown

**RE:** Objections to Plan 8 Wind farm Coombs

Dear Sir,

Hereby I wish to put forward my concerns and objections against your proposed wind farm. I reside and conduct my business Settlers Safaris from the farm Honeykop directly adjacent to the proposed site with the closest proposed turbine at 532 meters. Our lodge called "Bushmans Gorge Lodge" where we accommodate groups of up to 12 people, mainly foreign hunters, but also local hunters as well as tourists visiting Grahamstown, is situated on Honeykop farm. Besides the hunting I breed expensive species of game on Honeykop farm, such as Black Impala, Copper Blesbuck, Golden Wildebeest just to name a few.

My main concern is the loss of income I am expecting to incur. I have consulted with my return clients and their comments have been handed in to your company. They are all negative with regards to your project and since a lot of them come from countries where wind farms are common I value their comments. None of them show interest in travelling great distances to come and stay within sight of wind turbines let alone hunt in their shadows. One of them Mr. Arthur Newton has experienced personal loss by the erection of a wind farm directly next to his property in Scotland. Their comments in combination with a study I found, A PROBLEM WITH WIND POWER by Eric Rosenbloom 2006 which states that in surveys conducted by wind farm promoters, tourists indicate that 25 to 30% would no longer come if wind turbines would be installed, makes me very concerned for my livelihood as well as the livelihood of my workers. We have raised these concerns at your various information meetings and so far no literature has been provided that proves otherwise.

My second concern is the negative impact the project will have on property values. Even though no data is available locally, I find the outcome of a study conducted by a firm called Appraisal One with funding from the Calumet County Citizens for Responsible Energy (CCCCE) (Calumet County, Wisconsin) a good indicator. They found that land values decreased between 24 and 43% depending on the type of property. I personally as well as my neighbours have invested great amounts of money in our properties, to say that no studies have been performed locally and thus this impact cannot be proven I find naïve.

Bushmans Gorge Lodge, Honeykop Farm, P.O. Box 562, Grahamstown, 6140



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MURRAYCROUS

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The visual impact of your project is enormous, a photomontage of the project shows that 14 of the 27 turbines will be visual from my lodge. I am highly concerned with regards to your visual impact assessment, I find it incomplete and biased. The photomontage is very limited to sites that are ranging between 6 and 12 km away which show minimal impact of the project. I find it strange that legal requirements towards the notification process dictate that only direct neighbours need to be notified, but when it comes to the visual impact assessment it is accepted to ignore the neighbouring farms which are most affected by this project.

The conclusion of the report states that the area is not pristine or scenic, I find very offensive and a personal opinion of the specialist, which should not be included in a scientific report. The paragraph that suggests that the traffic along the N2 will not have high visibility of the turbines due to tall alien trees, is nonsense, the traffic will have clear views of the turbines 10 kilometres each way from the turbines. Alien trees only cover a small section along the N2 about 10 kilometres away from the wind farm. The way it is describes in your report it is made to believe that most of the N2 is covered by alien trees.

A fourth concern is the noise factor, again I find your report very ill prepared. Not only is it only limited to 2 receptor points of which one is further away from the turbines than our lodge, it also shows that a night noise test was never completed due to rain. Seen the time frame that was available for completing this report, surely another day could have been scheduled in to do this important report. The fact that your turbine expert from Nordex is not willing to put in writing that I will not suffer negative noise impact from this project shows me that this is actually a possibility. We breed expensive game species and as we all know animals have more sensitive hearing than humans. I am concerned that the noise level and so called infra-sounds may have a negative effect on the breeding behaviour of my animals and thus on my income. Can you prove that this wind farm will have no negative effect on our animals?

I cannot understand why no alternative locations have been identified. In my opinion there are other more suitable locations that will have less impact on the environment like state land or industrial areas which also have good consistent wind speed, if not better. Our area is mostly a game farming and conservation orientated environment of which the Great Fishriver Bushveld is of great historical value.

Another concern is due to the wind farm, my income will be considerably reduced, thus I will have to retrench staff. If this wind farm goes ahead as you plan, local game farmers will have no option but to retrench a number of staff due to loss of income! This wind farm will cause almost no job creation for people in the immediate local area, especially for the long term.

Bushmans Gorge Lodge, Honeykop Farm, P.O. Box 562, Grahamstown, 6140





SETTLERS  
SAFARIS

Ultimate African Hunting

MURRAYCROUS

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www.settlerssafaris.com

This wind farm is causing major anti- social behaviour in our local community, people that have been friends for a long time and even family have turned on each other as only 3 farmers benefit from this project while all the surrounding farmers feel that the wind farm is detrimental to them.

- Please can you make sure that the noise test can be done from our lodge.
- I requested the minutes from our meeting at the Graham hotel, date 6th May 2012, could please make sure that I am emailed these minutes as soon as possible, as well as our latest meeting dated the 4<sup>th</sup> June 2012.
- Have you taken the airstrip on Stoneyvale farm into consideration?
- Can you guarantee that the wind turbines will not exceed above 7db above the ambient noise from our lodge?
- If it is not accepted that wind turbines be allowed in areas such as Kruger National Park, then this proves that there are negative effects on tourism from these turbines, so why should we accept them on our doorstep when we depend on tourism for our and our staff's livelihood? The hunting industry in South Africa generates around R 606 million rand per year and the Eastern Cape is number three in most visited province by foreign hunters, according to Professional Hunters Association South Africa.
- What is the carbon footprint from these 27 wind turbines going to be once erected, taking into consideration all aspects, i.e foundation, manufacturing mast etc?
- Has a geological study of the soil composition been done, as there are clay mines in the area and this might affect the foundations of the turbines?

Please could you address my questions and requests accordingly?

With kind regards

Murray Crous

Petra Crous

Bushmans Gorge Lodge, Honeykop Farm, P.O. Box 362, Grahamstown, 6140



Karball Trading 99 CC t/a  
The Hills Game Estate  
P.O. Box 362  
Grahamstown, 6140  
Phone/Fax: 046 622 8474  
VAT number 401 024 0523

Grahamstown, 10th of June 2012

The Project Manager  
CES  
Grahamstown

### Proposed Plan 8 Wind farm – Frasers Camp

As a game farmer, one of many in the immediate vicinity of the proposed wind farm and reliant on the custom of the mostly foreign hunters and tourists, we are vehemently opposed to the project.

It will not only affect our business negatively, but the future land value of the property negatively. This area is mostly game farming orientated, of great historical background around the Great Fish River and must not be intruded upon by landscape changing turbines.

In our opinion there are other more suitable areas for the erection of these visual impacting structures such as on state land, where they will have less impact than on mostly conservation orientated environment.

Yours faithfully,

K. Rawstron  
N.Rudy  
O.Crous

Owners of The Hills Game Estate, Farm number 206

To: j.schmidt@cesnet.co.za

From: Mr Fred Pittaway  
BOX 2225

Grahamstown 6140..... Phone 0466223663

Date: Tuesday, 22 May 2012

Subject: **PROPOSED PLAN 8 GRAHAMSTOWN WIND ENERGY PROJECT,  
GRAHAMSTOWN AREA, MAKANA MUNICIPALITY, EASTERN  
CAPE PROVINCE OF SOUTH AFRICA.**

Dear Sir,

With reference to an email I read yesterday, 20 May 2012, which was submitted by Mr Dave Young, I would like to introduce myself and respond.

I am Fred Pittaway, a cattle and game farmer and neighbour to the above wind project. I am, owner of the farms Kalkvlei and Valleyview on which I have been farming cattle and game for more than 50 years.

I am astounded that the above project has received so much opposition. The generation of electricity by means of harnessing the wind is one of the older alternative means of generating power and I am convinced that renewable energy is the answer to our dependence on fossil fuel energy.

Wind power not only has the advantage of being a clean energy source but another added bonus is that the energy source is free and inexhaustible!

In addition to all the benefits of wind power I personally do not find the visual aspect of the turbines to be unsightly. They will enhance our skyline, reminding all that we are tapping into a clean and non polluting power source. Showing foreigners that we care about the environment. I am amazed that many of the people claiming to want to "protect" our environment are actually opposed to wind power, specifically if the wind turbines are in their view and in their "space" yet, no environmental pollution is created through the generation of electricity this way.

Surely Eco-Tourists will appreciate the sight of wind generators knowing that they are providing for a cleaner and less polluted environment.

It begs the question as to what the real reason for the opposition is ? Surely the benefits of "green energy", job creation and benefit to the surrounding community cannot be overlooked simply because it might slightly affect someones personal income potential?

It is unfortunately the natural response of humans to envy that which is beneficial to others but does not seem to advantage them.

I personally feel the area on which your proposed Wind Energy Project is planned for is ideally suited for the purpose. My reason for this statement is that the natural veldt is very stony and grazing is generally of poor nature, so the economic viability of the area will be enhanced and it is perfectly situated from a wind perspective. I am dead against the building of Nuclear Power Stations with the potential disastrous and deadly health implications for people and animals in their vicinity and coal fired power stations that belch out their filthy

gases and smoke into the atmosphere. I cannot understand why the South African Government is not accepting more Wind Projects and making provision for more Wind and solar Energy Power to the national grid.

In my experience of game, they will only be concerned for a very short time and only those on the property that the turbines are actually on .Even they will get used to them and not be affected in the least. I am sure that even erecting a normal windmill will initially have the same effect. One can just look at how animals adjust being close to a road or national highway, after a while it does not bother them in the least. In fact I am sure that hunting and culling using helicopters create more stress in animals than any wind turbine could ever do.

It is also my opinion that it will not have any negative affect on the price of adjacent properties. My own being immediately adjacent to Houkoers.

To close I would like to state that I completely support the proposed scheme as it is currently envisaged and I have no doubt in my mind that should this proposal become a reality that not only will it be beneficial to those directly involved in the project but also better utilise the area and create an upliftment in the area due to the financial input.

It will create more job opportunities, especially on the manufacturing side, provide cleaner, sustainable and most needed electricity to the benefit of all South Africans .

There arises a new business opportunity for Mr.Dave Young to modify, produce, and sell blinkers such as those used on horses and donkeys to his esteemed foreign clients so that they may protect their hypersensitive eyes from the horrific sight of the wind turbines while enabling them to concentrate better on their telescopic sights.

Yours Sincerely,

Fred Pittaway.

**WITHOUT PREJUDICE**

Monday, 21 May 2012

Mr Jadon Schmidt,

Coastal and Environmental Services,

PO Box 934,

Grahamstown.

6140.

**PER E MAIL: j.schmidt@cesnet.co.za**

Dear Sir

**PROPOSED PLAN 8 GRAHAMSTOWN WIND ENERGY PROJECT, GRAHAMSTOWN AREA, MAKANA MUNICIPALITY, EASTERN CAPE PROVINCE OF SOUTH AFRICA.**

I am unsure as to whom I should address this letter of comment. For reasons stated later on I have not attended any meetings, registered as an interested party or interacted with any of your people. Could I please therefore request that you hand a copy to the relevant person concerned in order to ensure that my comments and objections are noted?

I address this letter to you, as a director and, on behalf of George Building Supplies (Pty) Ltd a company duly registered and incorporated within the Republic of South Africa. I am mandated via a resolution of the directors to act on behalf of George Building Supplies (Pty) Ltd who are the registered owners of Chertsey Game Farm which is registered as Portion 4 of the farm Chertsey in the Bathurst district, in extent 947 hectares.

The business of the farm includes, but is not limited to

1. The breeding of game for resale
2. Hunting
3. Letting and accommodation
4. Eco tourism

The farm is bordered on the South by the Kap River, on the North by the Coombs River, on the East by the farm Elephant Park and on the West by Mr Glyn Dixon. The farm is game fenced and we have various game species which include Kudu, Nyala, Zebra, Hartebeest, Impala, Eland, Blesbuck, Mountain Reed Buck, Blue Wildebeest and Black Wildebeest. Species that also occur naturally and in abundance include Bushbuck, Duiker, Blue Duiker, Warthog as well as a vast number of other species that are too varied to list. In addition we have a large population of birds which include most of the



Raptor species as well as a healthy population of Owls and Knysna Louries, all of which reside in our pristine forested areas.

On Thursday 17 May 2012 I received an e mail from Glyn Dixon giving me late notice of a meeting to be held at the Graham Hotel that evening at 6pm. The purpose of the meeting was to discuss a proposed wind tower plan. Unfortunately I could not attend as I had a prior meeting of the Port Alfred Benevolent Society. Later that evening I got an opportunity to open the e mail and have a look at what is contained within the proposal and the draft EIA that was enclosed. This is the first time that I and my fellow shareholders and directors became aware of the scheme which is now in an advanced stage of planning.

At the outset I wish to vehemently place on record my objection to the fact that we have been informed of this project in this manner, and at such a late stage. Whilst it would appear from the report that your firm went to a reasonable degree of trouble to inform and involve most of the stakeholders we somehow were never informed. I reside in Port Alfred and I read The Talk of The Town. Not one of the parties involved, including your company, questioned why we, with a substantial investment in the game farming industry, were not concerned with a scheme of this nature and magnitude on our doorstep, and furthermore why we never attended any meetings.

I have conducted some enquiries and it would appear that some other major role players who are directly involved as stakeholders in the Game Farming Industry are also not aware of the danger that this scheme presents to us. I am thus now attempting to ensure that this proposal is fully understood by all parties concerned. As an example Elephant Park has expressed surprise when I informed them of the magnitude of this proposal. The foreign owner of this large reserve (at the date of this letter) is still not aware of this scheme as well as the significant impact that this proposal will have on his investments.

Like me I suspect that it will come to him as a horrible surprise.

The draft report that I have received is, as I understand it, now open for public comment until 6 June 2012. Kindly correct me if this is not the case. The report is lengthy and has been comprehensively prepared. It is indeed difficult, as a layman, to be able to fully absorb all that has been said but herewith my comments and observations.

#### **VISUAL IMPACT ASSESMENT**

I am not satisfied that this report deals with this item honestly and in an unbiased manner. My assertion is based on the wholly inadequate photomontage that accompanies this report. Not a single photo comparison was taken at Chertsey Game Farm, and others, where the impact will be significant. Most of the photos taken and included were from far away distances in order to show minimal impact (6.726km, 5.686km and 11.819km) and I find this disturbing.

From your report I have no idea as to the actual visual impact on Chertsey Game Farm as I have not been consulted and no photos were presented or included for comment.

My understanding however is that we will be significantly affected, as will other parties, and this is not fully or properly addressed in the report.

The significance of the adverse affects of these wind turbines from a visual impact and intrusion point of view are as follows:

1. The current and future value of the surrounding farms will be significantly reduced as a consequence of having to look at these huge turbines. If anyone has any doubt as to the size of these behemoths then drive to Port Elizabeth and have a look at how just one of these monsters dominates the surrounding area. Who wants to buy or own a property looking onto this proposed scheme vs. the current bush covered rolling hills.
2. Those operations dependant on hunting as a source of income will be negatively affected. Hunters, especially foreigners whom many of the farmers depend on for an income, will certainly not choose an African bush experience staring at a landscape dominated by large spinning turbines. These clients will go elsewhere.
3. Eco tourists would far prefer to look at scenic hills rather than spinning turbines and they will also take their business elsewhere.

At night instead of looking at the stars we will all be presented with a plethora of the statutory blinking red lights covering the hills and horizons. During the daytime they will be highly intrusive due to their size and Civil Aviation rules stating that they must be brightly painted.

The myth of believing that the scheme will in all perpetuity be limited to the proposed number of turbines is naive and a pipe dream. Once the infrastructure is allowed to take hold you can be assured that more will follow and once this phase is off the ground it will be difficult to stop or object to future phases.

Furthermore it is difficult for me to comprehend how we can rely on data from England and Wales in order to determine how the values of our properties are to be affected by the siting of these wind turbines. One can appreciate that the concept of wind farms is new to Southern Africa and few if any studies are available. I would suggest that instead of relying on vague data that a comprehensive study is undertaken as millions are at stake and people's livelihoods can be affected.

#### **LOW SENSITIVE AREA**

I naturally strongly disagree with the view expressed and your generalisation that the landscape character is not pristine and low sensitive to a development of this nature. With respect this is less than the truth and should you care I will take be happy to take you on a tour in order to show you pristine forested areas.

#### **NOISE**

I am not satisfied that any studies have been undertaken as regards the noise that these turbines emit and the specific effect that that this noise has on the naturally occurring game species on Chertsey as well as the other farms in the area.

Furthermore I have no indication as to what effect this noise will have on my introduced herds of Kudu, Eland, Nyala and Wildebeest, and whether this will affect the areas that they inhabit as well as their breeding and feeding patterns.

You are well aware that these animals have hearing capabilities far greater than humans.

I also have no indication as to what noise levels we and our guests will be exposed to on the various areas of our farm as we have not been consulted or given any information whatsoever.

## BIRDS

For information purposes I would be interested to hear what effects, if any, that these turbines will have on the night owls, Bustards, fledgling raptors and slow flying Knysna Louries that are common in the forested areas which occur in the immediate vicinity of some of the proposed turbines.

## CONCLUSIONS AND RECOMENDATIONS

Your report acknowledges that a high number of game farms occur within the study area. You also conclude that they will be subjected to very high levels of visual intrusion from this development.

You further conclude that the area is not scenic or pristine. My simple question to you is that if this beautiful area of ours is so unattractive then why have so many game farms been established and why have so many people invested huge sums of money in this area? To label the Kap, Coombs and Fish River areas as not being scenic and furthermore as low sensitive areas is in my opinion biased in favour of the developers, subjective and irresponsible.

In order to substantiate your conclusion the report then introduces the subject of wind energy being clean and sustainable. This is not in question and is accepted by all. Clean and sustainable power is however irrelevant in terms of the argument as to whether this is the best site.

In my view the glaring contradictions contained within the reports conclusions and recommendations render the argument in favour of these turbines fatally flawed.

The report is silent on the future extension of such a scheme and the suitability of neighbouring terrain. This to me is more of a threat than the current proposal, as once established it will be hard to stop more from being erected. There is no indication that by accepting this proposal that it will be the end. Conversely my view is that we will open the floodgates.

There are indeed far better places to site wind farms other than in the middle of a scenic area with an established game farm, tourism and hunting industry. Those properties that will be subjected to the proposed and future visual intrusion represent a material amount of capital and employ a large number of people. What this scheme proposes is to severely impact on the visual beauty of this area and negatively affect its existing potential as well as the viability of many of its stakeholders.

In conclusion I am left in no doubt that should this proposal, in its current form, become reality and I am forced to look at the proposed turbines, then the value of my property and lifestyle will be compromised. This in itself is unacceptable to me. Together with others, we are not prepared to accept that our rights be compromised by this scheme which will only benefit a few individuals. I am sure they are well meaning and only acting in their own best interests, but unfortunately this is to the detriment of other stakeholders with severe financial implications.

George Building Supplies (Pty) Ltd hereby gives notice that we reject the scheme, as it is currently envisaged, in its entirety. In this regard we reserve all of our rights under law.

Yours faithfully

DC Young

Director

E Mail [davey@datimbers.co.za](mailto:davey@datimbers.co.za)

Tel 082 7791372



G.B.Dixon  
Coombsvale  
7/5/2012

CES  
Grahamstown

Dear Anton

I have read through the specialist reports as well as EMPr Draft. A few issues came out of them for me.

The first issue is the finding of the old ox drawn plough on Gilead which was photographed and the specialist suggested placing it in area to be fenced off around two graves I showed him. That plough belongs to me and I put it there having come from my other farm. I was using it as a lever to open and close my neck clamp I made at the end of my cattle race! It is not something that has been there for hundreds of years and left there by our ancestors!

Secondly; the girl; was it Lee-Anne who did the study on vegetation; took pictures and I recognize a few of them on my farm and she speaks of over grazing and how that has affected the vegetation of the area. From my farm Gilead's perspective in the last 33 years or so I have been farming it post my father, overgrazing has not occurred. The recommended stocking rate to my knowledge is 1LSU to 7 ha and not 6 as was stated there.....never the less I have been running about 1 LSU to 10ha which does not make cattle farming too profitable here, hence the need to make these farms more profitable by wind farming and making them more viable economically.

In the Visual Specialists report, I see the Kapp River Reserve as being in close proximity to project and marked in red from a visual perspective. I would like to point out that NOTHING ever happens here. It does not even have game guards staying there let alone visitors or sightseers, because there is just virgin bush here and fynbos and scrub on the top of the Coombs ridge.

In my opinion there should be more effort throughout South Africa to have as many as possible of these renewable energy projects and less obstacles thrown before them. Coal driven electricity plants must be killing thousands of people indirectly everyday from all that soot and smoke and ruining the atmosphere and ozone layer. To me regardless of whether or not I benefit from this project, I find these turbines attractive and serene, utilizing GREEN, renewable energy.

Kind Regards.

Gavin Dixon



# Moll Property Trust

IT 689/96

## RESIDENTIAL ADDRESS:

Trumpeters Drift Farm 612  
Albany District  
GRAHAMSTOWN  
RSA

TEL: +27 (46)6225731  
CELL: +27 0828041669  
FAX: +27 (46)6368901  
E-mail: aaacm@intekom.co.za

## POSTAL ADDRESS:

P O Box 6105  
Market Square  
GRAHAMSTOWN  
6141  
RSA

Coastal & Environmental Services  
P O Box 934  
Grahamstown  
6140

10<sup>th</sup> June 2012

For Attention: Mr. Jadon Schmidt

Dear Mr. Schmidt

### Re: PLAN 8 / GRAHAMSTOWN WIND ENERGY PROJECT

I refer to our meeting held on Monday 4<sup>th</sup> June 2012 held at your premises at 11:00am as well as to your email dated 5<sup>th</sup> June 2012 at 03:53pm.

As brought to your attention, I have been completely unaware of the PROPOSED INFINITE PLAN 8 GRAHAMSTOWN WIND FARM.

Those of us who attended the meeting were informed that you had complied with your legal requirements when publishing the matter in the Grocott and EP Herald, the placement of your notice boards and informing the immediate neighbors to the proposed site.

At the outset I'd like to point out, that we as farmers do not have access to the newspapers you refer to on a daily basis and hence the chances are slim that we would have seen such a notice. No notice board was erected at the junction of the N2 and the Committees Drift Road or the Fort Beaufort and Committees Drift Road, which constitutes the only road running through the Fish River Valley from the N2 in the East to the Fort Beaufort Road in the South West and which happens to be the road along which all the large game farms in this valley are situated. To my knowledge none of the farmers in this region belong to the Coombs Farmers Association and would not have been aware of any discussions held at this forum. It was by a pure chance meeting in town, with Mr. Murray Crouse that this matter was brought to my attention.

Page | 1

Since receiving your email, setting the deadline for our input as being Monday 11<sup>th</sup> June 2012, which constitutes only 3 working days, it has been a mad rush to download all your documentation, try to read and assimilate the contents thereof and to contact the various farmers in the Fish River Valley to discuss the matter. As of today I have managed to contact 16 land owners, which comprises of 33 farms and together with those owners who have already registered as affected and interested parties with yourselves, comprise in excess of 90% of the total land ownership between the N2, Committees Drift turn off and the Fort Brown, Echo Pass Fort Beaufort Road junctions as well as the affected area in the Coombs Valley. The only people who do not want to be represented are those who will benefit financially from the wind turbines on their farms and a few of their immediate family members. There are four farms which have been recently purchased by the government and I do not know who to contact with respect to these farms.

I would like to state for the record that not a solitary farmer or game rancher in the Fish River Valley was aware of the proposed wind farm. We are of the opinion that for a project with such far reaching implications to so many of us, you should have gone beyond the mere legislative requirements that you followed.

Each and every one of them has asked me to reflect in this letter that they wish to be recorded as affected parties and their concerns are primarily those that will be set out below but are not limited thereto. These affected parties who wish to be noted as affected parties will be set out on an attached schedule "A".

Please note that we are still endeavoring to contact foreign land owners for their comment.

It is also an impossible task in such a short period for any of us as lay-men to read and understand the full meaning/impact of the opinions reflected in your study. The affected parties have therefore decided to obtain the services of an Environmental Specialist to study your findings in more detail to assist us to what we believe will result in the eventual legal actions.

A number of concerns which you asked me to document and which we believe will have a devastating impact on us are listed below and not necessary in order of severity and will obviously not include additional factors as established by the affected persons appointed specialist.

### PROPERTY DEVALUATION

We as game farmers/tourism operators have invested hundreds of millions of Rand's into the Fish River Valley and the Coombs Valley. Our properties in many instances are our greatest assets and we have spent years building up our properties and our business operations which we conduct from these premises. The hunting, photographic and tourism industry as well as the breeding and relocation of game is one of the largest income producers in the poorest province of the our country and the Fish River Valley and the Coombs Valley, contribute significantly to Provincial and Government coffers.

There is no way that anybody who can afford to buy established game farms and/or stock farms today will do so where twenty seven 150 meter high structures are clearly visible from their properties. We believe that should we want to sell we will be unable to do so, resulting in catastrophic financial implications to the land owners who will be affected in one way or another by the proposed wind farm.

International clients do not even want to see an internal fence on the property, let alone Eskom lines, so the visual impact created by these monstrous turbines which will be visible from the coast in the East to the Croomy Mountains in the West and far North to the town of Peddie, will not result in the African experience which foreign clients demand.

Page | 2

I would like to point out that five of the 27 proposed turbines will be less than 500 meters from the South Eastern border of the largest game farm in the Fish River Valley, which has only recently brought in foreign direct investment of approximately Forty Million Rand into the area. We believe that the loss of value to this direct foreign investment will have serious consequences.

#### VISUAL IMPACT

This is a further extension to the above paragraph and we would once again stress that our investment into the Fish River Valley and the Coombs Valley was done because of the natural beauty and the indigenous valley bushveld which prevails through the area. We believe that these wind turbines (150 meters high each, equating to twenty seven 50 story buildings) will scar the landscape forever. There is no way that these monstrosities can in any way enhance the beauty of these valleys.

I do not believe that the numerous tourists' who visit the valley for one reason or another, including all the historical tours of the various battle fields and historical monuments, will be impressed by the visual effect of this wind farm project.

As you are aware the N2 National Road is being upgraded, with work having already reached the Fish River cuttings and aerial markers have already been placed along the N2 adjoining our farm and passing the proposed wind farm site. This is due to the increase traffic along this route and one only has to see the number of tourist busses passing along this route to understand that thousands of visitors and tourists will have to pass through this wonderful valley and will be able to see wind turbines from other side Peddie to the top of Green Hills, close to Grahamstown. This will most certainly detract from the natural beauty that these visitors and tourists experience whilst passing through this area at present.

I note from your specialist documentation, it is stated that the traffic on the N2 through the proposed area will be screened by high trees. This is nonsense as there are no high trees except for the few positioned immediately to the West of the main entrance of Mr. Nortje's property (proposed site). I doubt whether this expert has been to site. Further more from your report and your photographs the high impact visibility sites marked in red are only indicated around the proposed turbine sites on the proposed properties. The distances given by your specialists as to being able to view the wind milling turbines are completely inaccurate as those of the erected one at Coega can be seen to be wind milling far in excess of 10Km distance.

#### LOSS OF REVENUE

To those of us who constitute ownership of the largest part of the land in this area and who operate photographic / hunting / tourism businesses from our premises, believe that our revenue stream will severely be curtailed. Most of us have or endeavour to have a return client base of approximately 65% or greater. Our clients travel from all corners of the earth and expect an African experience whilst on our properties. Internal fences, escom lines and the likes have a negative impact on their expectations and now the addition of the proposed wind farm will result in many first time visitors not returning and we believe a number of existing clients will do the same, finding an alternative African destination.

#### GAME RESERVES

The Double Drift Game Reserve, Andries Vosloo Kudu Reserve and the Sam Knott Reserve, which combined constitutes the second biggest Government Game Reserve area in the Eastern Cape will also be directly affected by the negative visual impact, being imparted to all the tourist and nature lovers who frequent these reserves. I am unaware whether the Provincial Nature

Conservation Department and Eastern Cape Parks Board are aware of the proposed wind farm and their response to this.

#### NOISE LEVEL

We note that from the noise impact assessment which we downloaded that a wind speed of 12m/sec was used to establish certain criteria; however what would the impact be, between 12m and 18m per second? Predominantly we have South Westerly prevailing wind and we believe that twenty seven 150 meter high turbines will generate a significant noise factor when flowing down the escarpment and into the Fish River Valley. It is fact that animals are extremely skittish in windy conditions.

We are concerned not only to the noise impact on humans, but on our game and we are unaware of what effect this will have on our breeding cycles and character on the game at large. Will they remain reasonably tame or will they become wild and skittish. Will they attempt to flee our properties and get killed or injured in the game fences or worse disappear into neighboring farms from where we will be unable to retrieve them, this resulting in further financial losses. This must also be constituted as a safety hazard on the National and Secondary Roads situated around our properties.

For the record, the owners living at Coombs Vale are able to hear when traffic passes over the reflective markers on the N2 as well as music emanating from taxis passing this locality. You are now proposing to place wind turbines between the N2 and his property, this will have a huge impact on all those land owners living around the proposed site.

We however believe that the noise levels and the effects thereof have not been adequately researched in your findings as presented.

#### POLLUTION OF WATERWAYS

At present, Mr. Botha Van Niekerk's farm, Spekboomveil and my own farm in the Blue River Basin are affected by the clay mines on Mr. Nortje's farm where the proposed wind turbines will be placed. The "caolin" deposits are evident in all the steep valley waterways draining from the escarpment (proposed site) down through our properties to the Fish River. This clay seals the ground and as you are aware negates any growth where deposited.

We would like to know what effect the runoff from the new erection sites will be, specifically whether or not there will be an increase of "caolin" in our waterways.

The above are some of the concerns we as affected persons would like recorded on the environmental impact study. Further professional advice and findings will be forwarded to yourselves within the 30 day period following the 11<sup>th</sup> June 2012.

All the affected parties listed on the attached schedule have specifically asked that you record them as affected persons in this matter and that you keep them informed accordingly.

Please acknowledge receipt of this letter and we look forward to further discussions with you in due course.

Yours Faithfully



Mr. Pieter de Villiers Moll

SCHEDULE "A"

**AFFECTED PARTIES**

<u>OWNER</u>	<u>FARM NAME</u>	<u>FARM NO.</u>
1. Moll Property Trust	Buffels Drift	No. 210
2. Moll Property Trust	Koodoo Kop	No. 211
3. Moll Property Trust	Trumpeters Drift	No. 612
4. Moll Property Trust	Long Vale	No. 635
5. Richard Palmer	Bridgewater	Portion of 206
6. Richard Palmer	Ashtondale	No. 119
7. East Cape Game Properties (Pty) Ltd.	Munster	No. 614
8. East Cape Game Properties (Pty) Ltd.	Runford	Portion of 127
9. East Cape Game Properties (Pty) Ltd.	Ulster	No. 128
10. East Cape Game Properties (Pty) Ltd.	Lakeside	No. 203
11. Coetzee Investment Trust	Woodvale	No. 201
12. Coetzee Investment Trust	Glenn Dew	No. 202
13. Coetzee Investment Trust	Portsmouth	Portion of 203
14. P E Investment Trust	Southey's Hoek	No. 212
15. Botha Van Niekerk Trust	Spekboomvale	No. 216
16. Albatros Investment Trust	Sutherland	Com 4
17. B K Webber	Connaught	No. 125
18. B K Webber	Athlone	No. 119-2
19. B K Webber	Leinster	Unknown
20. Connaught Farming Trust	Portion of Glenboyd	Portion of 204
21. Munster Trust	Glenmelville	No. 197
22. Munster Trust	Glendew	No. 200
23. Munster Trust	Glenelg	No. 199
24. Munster Trust	Cotswold	No. 202
25. Munster Trust	Portion of Boskydell	No. 195
26. Munster Trust	Portion of Southerland	No. 221
27. M Coetzee	Blydemoed (Coombs)	Title Deed No. 20633/1984
28. M Coetzee	Percival (Coombs)	Title Deed No. 0205/1984
29. Percival Farm Trust	Percival (Coombs)	No. C7
30. M D Coetzee	Coombs Vale (Coombs)	To be advised
31. New Heights cc	Bakers Farm	No. 1486
32. A Smailes	Glendowan	No. 205
33. K Bates	Drivebush (Coombs)	To be advised

WITHOUT PREJUDICE

4 June 2012

Att: Jayden Schmidt

Coastal Environmental Services

P O Box 934

Grahamstown

6140

**Objection to:**

Proposed Plan 8 Grahamstown wind farm project, in the Grahamstown area, Makana Municipality, Eastern Cape, South Africa.

**Objector:**

Edcot Trust t/a Huntshoek Safaris & Huntshoek Lodge cc

**Nature of business:**

- 1) The breeding of game for resale
- 2) Exclusive trophy hunting
- 3) Luxury accommodation

The farm Huntshoek was acquired in August 2005 for the purpose of game farming, hunting and tourism.

The farm has an abundance of, kudu, nyala, impala, duiker, bushbuck, zebra, wildebeest and warthog to name but a few.

Huntshoek is also home to elusive aardvark, batear foxes and a healthy population of tortoise and home to several breeding pairs of the magnificent Fish Eagle.

Huntshoek vegetation is commonly referred to in this area as "fishriver valley bush" type vegetation, which includes euphorbia, spekboom and many other delicate flora, which lends a special splendour to this area.

This area also extremely rich in history, folk lore and African culture; is a popular destination to avid nature lovers, historians and overseas tourists that come and enjoy this rugged, diverse and beautiful area and enjoy all things African.

**Investment:**

Since August 2005 we have invested millions of rand in upgrading facilities and infrastructure on the farm and therefore contributed greatly to the land value in this area.

Our investment is large and our commitments great and we would want to continue to contribute positively to this area and its communities.

Huntshoek and other game farms, lodges, eco estates and the community all have a vested interest to make this area “the frontier country” a top tourist destination in our country and ensuring that this area remains the biggest contributor to the health, wealth and security of the communities affected.

**Information neglect:**

It was with absolute horror and surprise that we were informed of a meeting that was to be held in Grahamstown on the 17 May 2012 to discuss the proposed wind farm project, already in an advanced state of planning.

Totally floored, that we as one of the major contributors to this area’s wealth, was completely ignored in the onset stages of a project of this magnitude, we could not begin to understand why???

As a responsible landowner, we no doubt, see the bigger picture and understand the need for alternative energy as a way forward, and have; ourselves; invested in such projects elsewhere. So we are well aware of the benefits, drawbacks and processes involved in alternative energy projects.

But how do we support a project if it does not support us.

We fail to understand that a project of this magnitude is discussed with a few landowners who are in the minority and they are able to voice **their** opinions and make decisions on a project of this size, without so much as to consider the opinions of the **majority** landowners in the area.



How can a minority decide on the impact that such a project will have on game farms, hunting and tourism in this area, when they themselves are not even involved in such business. It gives the impression that deliberate steps were taken to keep this project quiet for the benefit of a mere few until a point of no return was reached.

Notifications that were placed in the Grocotts Mail and EP Herald newspapers failed to supply such important information to a large portion of landowners in the area. To take it for granted that everybody in this area reads the Grocotts Mail and EP Herald is unfortunate and we yet to see a notice board !!!

**Negative Impact:**

The area in its entirety is marketed as the “Frontier Country” an area rich in history and attracts many folk from all over the world to come and experience the true Eastern Cape flavour.

The impact on game farms and tourism most definitely would be a negative one, as we rely extensively on the pristine beauty and untouched landscapes to attract visitors to our area and should these wind turbines mar this picture, which it will, visitors to most of the game farms and lodges in this area will drastically decline as no one wants to sit and watch noisy wind turbines whilst they paid to come and experience nature.

Would a project of this nature guarantee NO decrease in the value of land, or can it guarantee the increase in value of land? We fear none of the above is possible. The negative impact on investment return is great, as future investors would not want to purchase land that overlooks an “industrial area” or a farm that would not be able to benefit from tourism and hunting. Tourist and hunters would be scared off by the visual impact these monsters will have on their “African safari” and most certainly start looking at alternatives.

Surrounding communities stand to also lose a good source of income through employment that is offered by game farms and lodges, should these enterprises cease to exist or scale down.

Huntshoek together with other game/tourism business concerns, in this area are not prepared to have our right to make a living compromised by

**this project, while it would only benefit a few individuals with almost no vested interest in this community.**

**Conclusion:**

**As mentioned before the benefits and importance of alternative energy is great and should be pursued in an effort to extend the future of our precious planet.**

**But at no time should the pursuance of such projects enforce unreasonable / uninformed sacrifices.**

**Ask the question; why am I expected to sacrifice my livelihood to someone who did not even have the decency / respect to inform me that he/she/it was going to take it away????**

**It then leaves us with no alternative but to vehemently object to this project and request that we are immediately recorded as an affected party and have the recognition we so duly deserve.**

**We reject this project in its entirety, and in this regard we reserve all our rights under law.**

**A Timm**

**Huntshoek Lodge cc**

**Edcot Trust t/a Huntshoek Safaris**

Dear Sir or Madam:

We are hunters from the United States that have repeatedly enjoyed the hospitality of Professional Hunter Murray Crous who runs Settler's Safari's and lodge manager Petra Schutrops at Honeykop farm at Bushman's Gorge Lodge. Our hunts have always proved successful due most certainly to their valiant efforts, professionalism and high ethical standards of operating such a business. We have recommended Murray and Petra to many of our friends and acquaintances and we plan to continue to hunt exclusively with them only in the future due to the high quality hunts they have always provided. However, we are quite concerned as we now understand that there is a possibility that turbines might be erected on or near this peaceful and tranquil hunting area. We believe that this will have a very profound and negative effect on what is now a very superbly managed hunting ranch. If this does happen, we will be forced to look to other area ranches to hunt on as it will obviously have a very negative effect on the animals and the hunting there. We have seen this happen here in the U.S. and sadly as it is to admit, the outcome was very negative to the natural environment as it changed so very drastically that several species of indigenous animals virtually became non-existent. We strongly suggest and highly recommend that you re-consider your thoughts on this decision as it will most definitely cause us to reconsider where we might hunt in the future. It would be shameful to see such a lovely place be wasted so. If you would like, we welcome you to contact us personally for further discussion.

Sincerely,

Jerry W. Ford  
 955 Highway 10  
 Hartsville, TN 37074 USA  
 615-374-2337 615-374-2337

Kimberly Ford Wrinkle  
 1015 Oglesby Road  
 Hartsville, TN 37074 USA  
 615-519-6917 615-519-6917

Jason Ford  
 230 Sulphur College Road  
 Hartsville, TN 37074 USA  
 615-633-3385 615-633-3385



**Preparace Pekař spol. s r. o.**  
**Taxidermy**  
**Průmyslová 1895/1, 568 02 Svitavy**  
**Czech Republic**  
**IČ: 275 52 365**

**Murray Crous**  
**P. O. Box 362**  
**Grahamstown**  
**6140**  
**South Africa**

<i>Your letter</i>	<i>Our sign</i>	<i>Person</i>	<i>Svitavy, date</i>
	11001_LT1_VF	V. Fila	12. 12. 2011

**Case: Consideration**


---

Me Vladislav Fila and my clients where hunting with Murry Crous at "Honeykop lodge" and "Bushmans Gorge Lodge" the last years. We are in hunting business "Settlers Safaris".

We are planning to hunt there also in future, but when in the close area would be wind turbines we would not come! Me and my clients would like to visit virgin nature of Africa and no view with wind turbines.

---

| Bc. Vladislav Fila  
 |  
 | Preparace Pekař spol. s r. o.  
 | Průmyslová 1895/1, 568 02 Svitavy  
 | Průmyslová 1895/1, 568 02 Svitavy, Czech Republic  
 | v.fila@seznam.cz  
 | GSM: +420 739 633 688



Preparace Pekař spol. s r. o.  
 Průmyslová 1895/1, 568 02 Svitavy  
 IČO: 275 52 365

Adrian Sailor  
14 Lawnsfield Walk  
Parkside  
Stafford  
ST16 1TS  
UK

Dear Murray

I am saddened to hear of this potential wind turbine issue. After hunting with Settlers Safaris I know a problem like this will obviously cause an issue with your business at Bushmans Gorge. This will affect the animal numbers and quality and hence my clients may think twice about rebooking. This has consequences for your business and also mine.

I am certainly against this proposal. There are plenty of other locations these can be housed, certainly not anywhere near a game reserve such as yours.

Please let me know how things progress.

Yours faithfully

Adrian

**Dear Murray and Petra at Settlers Safaris.**

**I have heard the news about the wind turbine plans nearby Honeykop...**

**I have allways enjoyed to hunt with you guys at Settlers Safaris at Buschmanns Gorge, Honeykop and have had the pleasure of doing it several times.. And the friends I have brought there has also had the best hunting time in SA ever.**

**But I'm sorry to tell you, that this project will make me and my friends consider finding an other place to hunt, because we know from Denmark that the animals don't like to live nearby turbines - and we don't wanna travel so far for hunting without result.**

**I'm sorry - I really do hope that this decision will be changed so we can go hunting again in 2012 at Buschmanns Gorge, Honeykop.**

**We will be planning next SA- hunt during the next couple of months, so please keep me informed**

**Best regards from**

**Sussie Torné Roed  
Karensvej 15  
4440 Moerkoev  
DENMARK**

Date: December 13, 2011  
From: Charles A. Krauss, Esquire  
Subject: HoneyKop Farm/Bushman's Gorge Lodge/Settler's Safaris

To whom it may concern:

My name is Charlie Krauss and I am a U.S. citizen and work as a patent attorney in the New York City, NY area of the United States. For the past six years I have visited and hunted with Settlers Safaris on HoneyKop farm and stayed at the Bushman Gorge Lodge. I have been so impressed with the quality of hunting and pristine beauty of the land that I have brought several groups of friends and family with me over the years. I estimate that me and my guests have spent almost R1,000,000,000 over the years all in or near the HoneyKop farm. One of the main reasons people visit Africa is to see that pristine beauty of the land and enjoy the outdoor wildlife.

I was horrified to learn that beauty is potentially going to be ruined by the presence of enormous wind turbines. I can only ask why? Does the community know what kind of economic impact this will have? I cannot think of too many Americans who would want to take a 20 hour flight to sit amongst wind turbines. If they wanted to do that they would not have to fly to Africa. In short, the impact on HoneyKop, Bushman's Gorge and Settlers Safaris would be devastating.

Please contact me at the address below if you would like further elaboration.

Sincerely,

Charles A. Krauss, Esquire  
2 Longview Road  
Tewksbury, NJ 08833 USA  
[charliekrauss@gmail.com](mailto:charliekrauss@gmail.com)



## Re: If you have some time please read this email!

From: **DeFord, John** (John.DeFord@crbard.com)

Sent: 17 December 2011 08:08:54 PM

To: Murray Crous (bushmansgorge@hotmail.com)

Murray:

I'm so sorry for the delay in responding to your previous email. I was very surprised and shocked to learn that your neighbor is planning to install wind mills/ turbines near Honeykop Farm and Bushmans Gorge Lodge. As you know, it's a highlight of my year to travel to Settlers Safaris to both hunt and relax. The pristine bush and beautiful habitat is a real treat and will certainly be disrupted by the installation of wind mills. If this is to continue, please advice me on other possible locations to visit and hunt as we'll have to think carefully about coming back to Honeycop.

Sincerely,

John A. DeFord, Ph.D.  
Senior Vice President, Science, Technology & Clinical Affairs  
C.R. Bard, Inc.

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Subject: FW: wind turbines what a waste of natural hillsides.  
 From: Arthur Newton (arthur1945@live.co.uk)  
 To: murraycrous@yahoo.com;  
 Date: Tuesday, December 13, 2011 8:45 PM

From: arthur1945@live.co.uk  
 To: arthur1945@live.co.uk  
 Subject: RE: wind turbines what a waste of natural hillsides.  
 Date: Tue, 13 Dec 2011 18:42:33 +0000

From: arthur1945@live.co.uk  
 To: murraycrous@yahoo.com  
 Subject: wind turbines what a waste of natural hillsides.  
 Date: Sat, 10 Dec 2011 20:17:56 +0000

Murray we have just moved from scotland where the western glens have been filled with wind turbines ,these monsters are almost twice the height of big ben clocktower in london and totaly destroyed the natural beauty of part of our national parks. Not only does most locals hate them but tourists cannot believe we have permitted it to happen. You may have seen the BBC NEWS last night showing one on fire and most closed down due to high winds they cannot produce in strong wind or little wind conditions making them a poor source of consistant electricity,there has also been cases where blades have broken off this would not be acceptable in South African bush .The dangers to birds is well documented as many have been found dead below the towers please remember the blade tips are traveling @well over 120 MPH ,I have a friend whose job it was to chase away nesting birds. You will also have to put up with noise polution as t his can be heard over a good distance ,my neighbours were always complaining. The foreign company that builds these monsters will promise jobs but it never happens once the service roads are in only specialists are employed usualy there own men and probably only 4 or 5 at the most for a wind farm of 26 .These people offer shares available to encourage locals but beware there is two companies 1 to build and supply the energy and 1 to distribute and sell it,you will not be getting rich,Europeen polititions have been talking about the sale of Green Energy certificates for profit for years but it still goes on ,These companies produce green energy and sell them to producers of black energy (COAL) in order for them to produce more,there is no reduction in carbon emmissions although it has to be said coal is cheap and a good continuous source of electricity much has been done to filter smoke and emmissions.Gas is a good source of power along with oil and nuclear all these are continuous but expensive to build and of course it takes time.However in conclusion Murray these monsters are not consistant ,spoil the natural landscape,do not create jobs and still have to be supported with other forms of continous energy ,demand time and money is always at the back of this issue ,the power companies will make any excuse to wrigle off the hook they have left it to late for to long to invest in relliable sources of energy .I will forward the e mail address of Ray&Ann Berry two good friends who moved away also to Crete after a long battle to stop the wind farm I think Ray may have the technical statistics to submit evidence. Many thanks Arthur & Jackie.

<http://us.mg4.mail.yahoo.com/neo/launch>

2012/01/23

APPENDIX D-9: Attendance register for Stakeholder engagement meeting – Coombs Community Hall 23<sup>rd</sup> January 2012

## ATTENDANCE REGISTER

Plan 8 Grahamstown Wind Energy Project (Environmental Impact Assessment – Scoping Phase): Stakeholder Engagement Meeting, Coombs Community Hall, Venue - 23 January 2012, 17h30.

NAME	POSTAL ADDRESS	CONTACT			
		TELEPHONE	FAX	CELL PHONE	EMAIL
MARZO HOCKEY	Box 2273, GHT	0829232883			m.hockey@x1.co.za
Peter Klyhi	Box 284	0828252684			rwylie@vodanet.co.za
O. CROSS	PO Box 362	0826609974			echecklo@x1.co.za
D. Dixon	Box 6292	041-6224740			
L.S. Dixon	"	"			
P. Cross	Box 362	0834168256			bushmansgorge@
M Cross	"	0720188496			hotmail.com
M. Ewee	Box 61	0823007730			
A. Sparrow	Box 506	0834060305			
F. Nortier	BOX 19	0795276335	046-622118	046-6361810	felicity@dekterk-devillers.co.za
M. Ewee	Box 621	0823007731			do
Marné Ewee	Box 621	0823007730			do



ATTENDANCE REGISTER

Plan 8 Grahamstown Wind Energy Project (Environmental Impact Assessment – Scoping Phase): Stakeholder Engagement Meeting, Coombs Community Hall. Venue - 23 January 2012, 17h30.

x2  
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NAME	POSTAL ADDRESS	CONTACT			
		TELEPHONE	FAX	CELL PHONE	EMAIL
BERNIE DIXON	P.O. Box 292	046 622 7753		074 172 3239	gbd@geenet.co.za
GAVIN DIXON	P.O. Box 6292	"		"	"
FRED PITSOPO	P.O. Box 2225 GTN	046 692 3663		0834492762	valleyview@xsinet.co.za
GILBERT COETZEE	P.O. Box 2204 GTN	0466227812		0828085961	GMD@GEENET.CO.ZA
GAVIN DIXON	Box 6292 GTN	046 622 7753		0814784947 0847615097	gbd@geenet.co.za
Gdym Dixon	Box 6272	046 622 7776	0866204765	0727641303	claypits@geenet.co.za
Sue Dixon	"	"	"	082 290 1255	claypits@geenet.co.za

**MINUTES OF COOMBS AGRICULTURAL ASSOCIATION**

**COOMBS HALL**

**23<sup>rd</sup> of January 2012**

**Present;** G.B. Dixon, G.L. Dixon, G. Coetzee, O. Crous, P. Schutrops, M. Erwee, M. Crous

**Visitors:** WO Mgoma, Sgt. Yaya, Const. Ndete, S. Dixon, D. Dixon.

**Apologies;** J. Allan, K. Baite, G. Ter Blanche, C. Timm

G.L.D opened the meeting. The previous minutes were read out loud and accepted. GLD thanked the police for their attendance.

**1. SAPS Report**

In previous meetings rezoning of the police areas was discussed. It was suggested that there should be a new boundary at Dave Young's farm and that the farms in the Coombs area should be rezoned to belong to the Grahamstown zone instead of Seafield as this would shorten response time. According to WO Mgoma this would be possible but it would mean that open dockets need to be transferred. GLD suggested we wait with our request till Yanini is prosecuted. This was accepted by the members present.

**SAPS Report Committees**

- No new cases at Committees. Very quiet period. Just 1 case of negligent driving and a case of stock theft at Paul Webber, sheep and goats were taken.

**SAPS Report Seafield**

- November: 3 cases; 1 assault and 2 house break-ins
- December: Housebreak-ins the main problem but 6 people arrested with regards to this. 1 case of stock theft.
- January: 3 cases of housebreak-ins for which an arrest was made as well as 1 assault case for which 1 suspect was apprehended.
- Perlemoen poaching was a big problem over the holiday period.
- Yanini: The DNA tests were completed and returned. The blood samples matched.
  - ME enquired after his fire arm. He was advised to contact Lt. Maleki 082 319



9255. Yanini's court case will be held on the 24<sup>th</sup> of February and the hand gun will be used as evidence. The fire arm should be released after the court case.

- There were accusations made that a generator and diesel that were stolen in the Coombs could be found at a certain person's house. These accusations were followed up and the generator was not the same as the stolen one.

## 2. FPA

- a.) JA still needs to invoice ME and Sid asap.
- b.) OC questioned the fee structure of non-members of the farmers association if fees should be paid once off or on a yearly basis. JA will be asked to clarify. GLD to follow up.

## 3. GHT Stock sale

- a.) At the GHT stock sale AGM Pierre De Klerk was voted new chairman. It was also decided upon that Spencer Hill will be a fixed staff member at sales
- b.) As for the accuracy of the scale. The association has decided to upgrade the scale with an additional monitor that measured in increments of 1 kg. This upgrade should be installed in the 1<sup>st</sup> week of February.
- c.) The Stock sale association will be organising a 'Fat Lamb, Fat Cow competition'
- d.) The Coombs has duty in June 2012 and January 2013.

## 4. Roads

- a.) GLD reported that according to Collin Purdon of the steering committee of Agri EC there is no money for maintenance on roads. They are trying to get funds available to grade roads.
- b.) OC suggested that it is possible to hire a grader as was done by the community to fix up the Highlands road. The farmers did it themselves.
- c.) GBD suggested a 'work on the road day'. Every farmer would make available some staff to trim branches and fix potholes. This idea was accepted and GBD will coordinate it.

## 5. Correspondence

- New minimum wages per 1 march: R 7,71 per hour, R 1503,90 monthly

6. AGM

- GLD read out the chairman's report.
- Finances.
  - a.) AS suggested that as the association has a substantial amount in the account we should consider investing this money somehow, i.e. 32 day notice account or market link account.
  - b.) CAA and Tennis club have not paid for the use of the Coombs Hall. Hall committee to be asked to invoice asap.
  - c.) Eskom donation not received. PC to forward banking details again to Kempie.

• Office bearers

The following bearers were chosen:

Chairman: J. Allen – not present so MC to contact to see if he will accept  
 Vice Chairman: M. Crous  
 Secretary: P. Crous  
 Treasurer: A. Sparrow

Executive committee: M. Crous, G. Coetzee, G. Ter Blanche.

The meeting was closed and followed by a presentation by CES about the proposed wind farm.

The final scoping report for 27 turbines has been handed in.

A turbine has 3 x 50 meter blades, uses 100 meter diameter and will be 80 to 100 meter high. The turbines need to be 500 meters apart and 500 meters from a home stead.

Contact details:

Jayden Schmidt – <a href="mailto:j.schmidt@cesnet.co.za">j.schmidt@cesnet.co.za</a>	CES
Bill Rowlston – <a href="mailto:b.rolston@cesnet.co.za">b.rolston@cesnet.co.za</a>	CES project leader
<a href="mailto:Zuben.jessa@plan-8.co.za">Zuben.jessa@plan-8.co.za</a>	Plan 8
<a href="mailto:Jason.cope@plan-8.co.za">Jason.cope@plan-8.co.za</a>	Plan 8

**To:** Anton Ferreira (iggy.ferreira@gmail.com); Anton (antonmaclean@telkomsa.net); Fred Pittaway; Dave de la Harpe (groupofadvocates@roundbar.co.za); Dave Young (davey@datimbers.co.za); Wayne and Felicity Nortier (felicity@deklerk-devilliers.co.za); Syd & Sandy Young; harts@hartwood.co.za; Kevin Bate (move-ited@hotmail.com); Keith Lockyear; Jano & Natasha Michau (jmichau@zazu.co.za); Gavin & Ruth Schroder (ruth.schroder@eskom.co.za); Maryna Beneke (maryna.beneke@impilo.ecprov.gov.za); Emile Fox (escapepools@gmail.com); Mario & Judy Hockly (m.hockly@ru.ac.za)

**Subject:** Coombs Agric Assoc Meeting, 23 Jan

Hello all

This is a general email to notify you of The Coombs Farmers' Association meeting to be held next Monday, 23 January. Anybody is welcome to attend, whether you are a member or not. You are welcome to attend the complete meeting, or just a part, if that suits you better.

I have attached the fee structure from Agri East Cape. This is the body whom the local Farmers/Agricultural associations fall under. The fees are based on Turnover. If there are any people interested in joining the Coombs association, these are the fees required by the Coombs Association, which we pass on to Agri EC. I have also attached a list from Agri EC, stating what they have done for the farmers this past year.

Agenda of the Coombs Agric Assoc AGM 23 January 2012 (Monday)

- 3.30 pm SA Police report
- 4.00 pm General Business & AGM
- 5.15 pm Tea/drinks break
- 5.30 pm Presentation by Hilton Newcombe of CES (Coastal & Environmental Services) on proposed wind farm on Gilead (Gavin), Houkoers (Wayne) and Towerhill (Morne) farms
- 6.30 pm Bring & Braai (Bring your own meat, drinks & salad)

The wind farm talk will also include discussion about the possibility of additional proposed sites in the area.

Thank you  
Glyn Dixon  
H – 046 6227776, C - 072 764 1303

APPENDIX D-10: Attendance register for Public meeting – Graham Hotel, Grahamstown 17<sup>th</sup> May 2012

NAME	Tel	Address	<del>Where you from</del> Email
P de Clerk	0828093425	Box 160 GHT	
P. Crow	0720488496	Box 862 GHT	bushmansgorge@
M. Crow	0834468256	Honeykop Farm	hotmail.com
Rob Cooper	0822671888	Isnek Rd, Grahamstown	roba@tempuser.co.za
K. RAWSTRON	0837031740	THE HILLS. 6 TOWN	Krawstron@Live.com
M. Self	016158263755	U.S.A	mssalect@bellsouthnet
E. Dzwilid	0215901419	246 Oovertrek Rd CT	05312, Dzwilid@lynx.com
O. CROUS	0826609974	Box 362 GHT	FAX 0416 6228474
G.L. DIXON	0727641303	P.O. Box 6272 Grahamstown <sup>6141</sup>	claypits@geeneticon.co.za
G.B. DIXON	0847675097	Box 6292 Grahamstown <sup>6141</sup>	gbd@geenet.co.za
C. Dixon	0741723239	Coombs Jate Farm	corinne@settlerscity.co.za
M Erwee	0823007730	Po 621 Grahamstown	erwee.morne@gmail.com
Maida Erwee	0823007731	Box 621 Grahamstown	erween.morne@ynwil.com
W. NORTIER	0823193207	P.O. Box 19 GHT	NortherW@saps.org.za
F. NORTIER	0807195274335	P.O. Box 19 GHT	felicity@deklek-devilliers <sup>CO. ZA</sup>



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## MEETING MINUTES

<b>CLIENT</b>	Infinite (Pty) Ltd
<b>DATE</b>	17 <sup>th</sup> May 2012
<b>VENUE</b>	Grahamstown Protea Hotel
<b>TIME OF MEETING</b>	6:30 pm
<b>MINUTES BY</b>	Justin Green
<b>CIRCULATION DATE</b>	

ATTENDED BY		
NAME	ASSOCIATION	EMAIL ADDRESS
Mr Jadon Schmidt Mr Bill Rowlston Mr Justin Green	CES	j.green@cesnet.co.za
Zuben Jason Albrecht	Infinite Plan 8	
See attached register		

Name	Question/ Comment	Response (Infinite and CES)
Glen Dixon	What are the chances of the project happening?	<b>(BR)</b> We need to get authorisation, followed by an assessment. CES has done the scoping and EIA. We do not work for the developers, but we have found no flaws or objections <b>(Zub)</b> Wind and solar are important in South Africa, with 1850MW in this section. We currently use 90% from coal burning. South Africa would like to get clean power up to 30%.
Glen Dixon	Were alternative sites identified for wind farm sites?	<b>(Zub)</b> Chose the site based on high voltage line and matching up to wind. <b>(Jason)</b> Software available to site, a computer model of wind, gathered wind information around the country and put this into the model and then used this to identify the site. Then take the wind data and match it to the voltage line.
Murray Crous	Why are they built near to the main road?	<b>(Zuben)</b> You are dealing with large trucks, and the blades are 60m in length and this creates problems for transporting off the main road. It is easier and cheaper to build



		closer to the main road.
<b>P. Crous</b>	Can we go through these (specialist studies)? In specific, the noise assessment. How did you reach 45dB?	WindPro can be used to measure the details and create a model, placing noise receptors next to houses; you can measure the noise levels. Going to the house, we will measure the background noise, and then figure out what the noise will be. 35dB is the night time legal limit.
<b>P. Crous</b>	How does distance affect the noise levels?	(Jason) Distance isn't the only factor. Topography of the landscape is important as well. Placed behind a mountain versus on top of a mountain. <ul style="list-style-type: none"> <li>• Bill suggested they place their comments in writing</li> </ul> (Zub) We haven't finalised the positioning yet. (Jason) We can put this into a 3D model, as well as the noise, and we can explain the noise methodology.
<b>Murray Crous</b>	Are you happy with the specialist studies?	(Zub) We contract CES and we have our own specialist studies. (JS) Physical on-site monitoring will be done.
<b>Murray Crous</b>	Are you a client of CES?	(JS) We are contracted to them. (BR) We remain independent contractors.
<b>Ossie Crous</b>	Specialist report – Diagram 7.1 – Table 15 – Figure 2, locality. Are the tables not supposed to be turned around?	(BR) We will have a look at it and correct it if it is incorrect.
<b>Murray Crous</b>	Should a social impact study be compulsory?	(JS) We don't have enough information in SA. (BR) There will soon be a requirement, but right now it comes down to experience. (Zub) It is difficult to talk about social without economic. Government has asked to look at economic development programmes. 2-5% of the ownership to the community and a trust fund must be set up. A yearly audit will be done to confirm this.
<b>Murray Crous</b>	How many jobs will this create?	(Zub) Very few jobs, but it will be operational for 20 years. (Jason) Our job as developers is to look at the technical aspects. It is compulsory to give that percentage away, how it is used is not up to us. Investors will say how they would like to use the money. (Zub) Construction phase will be done all over South Africa, large scale construction will be started here that will create jobs. (Jason) The decisions will be made by higher authorities. Community means within 50km of the farms. Schools etc. will be built.
<b>Murray Crous</b>	I don't want to see a squatter camp going up near my farm.	(BR) There are rules to the building construction. An EM will control this.
<b>Ossie Crous</b>	What will local farmers have to look towards questioning after the building of the turbines?	(JS) Everything has been recorded. Can test that to the real data.
<b>Murray Crous</b>	Questioned the noise impacts with referral to online forums.	(Jason) Software shows extensively that there is good data. (JS) Different makes of turbines make different noises.
<b>Murray Crous</b>	Can we get written notice to change if it is above 45dB?	(Alb) Although you may still hear it, it could still be beneath the legal limit. They model to be within the legal limit so as to not cause any medical issues. Must not cause

		physical damage. (Jason) We can send you documentation describing the noise level. We are bound by law to stick to the guidelines. The government can shut us down if we do not comply.
Ossie Crous	Will there be financial compensation for the project? It will cause a loss of farm value.	(Alb) What would bring down value more? A nuclear plant or wind turbines? (BR) If there is written data showing this, then please place it in writing.
Gavin Dixon	I know of neighbours who like the idea of having a windfarm.	
Ossie Crous	What is the prevailing wind direction? With relation to noise etc.?	(Jason) We can show you the wind model. (Alb) We are still doing the 1 year monitoring, but we can inform you after the study is completed. (Zub) From the specialist study, data was collected for the EIA.
Ossie Crous	Do you agree that wind direction affects noise?	(ALL) We agree.
P. Crous	Do we know the prevailing wind speed?	(Rub) The average in the area is 7.7km/h. It cuts out at around 25km/h. The blades turn to use the wind to slow it down, as well as a large brake inside.
Murray Crous	Have they ever braked and broken?	(Zub) Not in our history it has not.
Ossie Crous	Read an extract regarding exploding wind turbines.	(Jason) 25 years of engineering makes us believe our turbines will not explode. These are the oldest and most developed turbines that are out there. Please pass these documents on to me. (Alb) In Hamburg they are using turbines within the construction areas of a building without issues.
Ossie Crous	Any research been done on the behaviour of game? What effect will this have on game? The noise and visual effects.	(Zub) Its new to South Africa, so no studies have been done. (JS) No impact on livestock has been noticed. Electricity pylons have not shown any impact on game in the area. (Alb) I was recently in France, where there are not many fences and wild boar move around a lot. They don't seem to be affected, including breeding. They have sensitive hearing and do not run away.
Murray Crous	What was the height of turbine versus distance?	(BR) 1.5 times the height of the turbine.
Gavin Dixon	The layout of the boundaries is incorrect.	(JS) The information from you and the Surveyor general are different.
Murray Crous	If you have a game farm or lodge where overseas clients pay to hunt, being your only income, would you be happy?	(JS) It's a problem in that the Eastern Cape has game as well as wind and a good electrical grid. (Zub) Lots of people are benefitting from the windfarm. (MC) I will be opposing it, I just don't want bad feelings. (Rub) This is helping the whole of South Africa. There will always be negative effects associated. (MC) I don't believe that the wind etc will be policed. (Zub) There are CA regulations.

		<p><b>(MC)</b> Will you stick to the guidelines?  <b>(Zub)</b> Absolutely.  <b>(JS)</b> The developers have been great at dealing with issues so far.  <b>(BR)</b> We will.</p>
<b>Glen Dixon</b>	Price of land value depends on the type of business you are running. A business running with eco-tourism will be affected. The game will be affected by noise and visual. The 2-3% funding must be used in the 50km. My request is can the 2% be focussed on the surrounding neighbours to benefit from that and not anyone 50km away?	<p><b>(BR)</b> You must realise that there are schools etc. that can really use the money. If you have ideas of where to use the money, please tell us.  <b>(Jason)</b> Any help there would be appreciated. Can show you the guidelines that discuss how the amount must be spent, please approach us however.  <b>(Zub)</b> We must compete with other companies as well, but governments will look at how we spend that money. There will always be issues with people close to the windfarms.</p>
<b>Leigh (Grocotts)</b>	The trust is still being explored; have any ideas as to where to spend it?	<b>(Jason)</b> We will partner with the operators of the farms.
<b>Ossie Crous</b>	Specialist visual impact report – 26km away has been scanned, but not the farm next door?	<p><b>(JS)</b> We have submitted visual montages.  <b>(OC)</b> Other farms have been included but not the farm right next door.  <b>(JS)</b> We can arrange to get those to you.  <b>(BR)</b> Whatever you need, we will do our best to get that to you.  <b>(JS)</b> We have done our best to get back to everyone.</p>
<b>Murray Crous P.Crous</b>	Can the specialist come back and do it again? Why could he not come back when it wasn't raining? I don't think theory is always the same as practical.	<p><b>(Zub)</b> We can arrange for a study to be done.  <b>(MC)</b> So if we request that can we still get that?</p>
<b>Ossie Crous</b>	The location of the turbines are said to be located on a flat plain. It is from the visual specialist.	<p>This was then discussed.  <b>(Rub)</b> Suggested he discuss the issues with Jadon in a private meeting.  <b>(BR)</b> We need to know the context and where you have found it.  <b>(Zub)</b> There can be different meanings.  <b>(BR)</b> Protected areas can be identified as different areas.</p>
<b>Closing of Meeting (BR)</b>		



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**MEETING MINUTES**

<b>CLIENT</b>	Infinite Plan 8 (Pty) Ltd
<b>DATE</b>	4 <sup>th</sup> June 2012
<b>VENUE</b>	CES offices
<b>TIME OF MEETING</b>	11:00 am
<b>MINUTES BY</b>	Tarryn Martin
<b>CIRCULATION DATE</b>	

<b>ATTENDED BY</b>		
<b>NAME</b>	<b>ASSOCIATION</b>	<b>EMAIL ADDRESS</b>
Mr Jadon Schmidt Mr Bill Rowlston Ms Tarryn Martin	CES	
Zuben Jessa	Infinite Plan 8	
Orgie Crous Murray Crous Petra Crous Dave Young Ardrie Tim Pieter Moll		

<b>Name</b>	<b>Question/ Comment</b>	<b>Response (Infinite and CES)</b>
<b>Pieter Moll and Dave Young</b>	Concerned that he wasn't informed of the project  CES can contact FASA for a list of people belonging to the hunters association	(BR) Explained that they are only required to inform all immediate surrounding landowners. He went on to explain that the project details and public meetings are placed in a regional and local newspaper, inviting I&AP's to register as well as site notices being placed on the fence of the property portions.  (BR) Asked if it is possible to access the contact information of other game farms that could potentially be impacted on.
<b>Pieter Moll and Adri</b>	Concerned that they did not have copies of the EIR	(JS) Explained that they can be found on the CES website and in public

<b>Timm</b>		libraries (BR) Explained how the Public Participation Process Works
<b>Dave Young</b>	Raised concerns about the size and colour of the turbines and the negative visual impact.	(BR) explained that the colour was due to the Aviation Act Requirements
<b>Dave Young, Pieter Moll</b>	Dave and Peter both raised concerns about the negative impact the turbines will have on the value of their property	(BR) explained that there is no way of knowing what the impact will be as there are no wind farms currently in South Africa
<b>Pieter Moll</b>	Peter stated that the area has lots of game farms and that the hunting industry in the Eastern Cape brings a large amount of revenue into the province. He raised concerns that the negative visual impact of the turbines will result in his clients seeking other areas to hunt in, if the turbines are put up. He asked whether other areas have been investigated as an alternative location for the wind farm.	(BR) Explained that the developer selects the areas based on a desktop study using a software package that models the best regions to locate wind farms. He doesn't know if other areas were looked at and invited Peter to submit his comments in writing and he will ask the developer to comment on them.  (BR) asked Peter what he would like CES to show them in terms of the visual impact
<b>Pieter Moll</b>	Peter's two main concerns are:  <ol style="list-style-type: none"> <li>1. The devaluation of his property due to the presence of the turbines</li> <li>2. The loss of clientele to his game farm, which is his livelihood and something he has invested large amounts of money in</li> </ol>	(BR) asked Peter to put all his comments and concerns in writing so that they could be included in the report without misinterpretation
<b>Murray</b>	Asked Zubin about a comment that was made at the previous I&AP meeting where he said that "he didn't care about the farmer's view from his veranda but rather about the social upliftment such as putting in schools and hospitals"	(BR) Statement was misinterpreted and taken out of context.
<b>Pieter Moll</b>	Wants to know if the historic value of the area has been considered in the report especially since his historic tours will be impacted	(BR) asked Peter to raise this concern in writing
<b>Dave Young and Pieter Moll</b>	Suggested that the wind turbines are located elsewhere, on municipal ground, where there are	(BR) Explained again how the sites are selected using software



	existing power lines and the visual impact is not as great	
<b>Dave Young</b>	Wants a specialist report done on the devaluation of the property as a result of the wind farm and raised concerns that the assessment is flawed as it didn't include a specialist report on the impact on the property price	(BR) Asked Dave to suggest a way of doing this in an objective manner and explained that this was very difficult to do since there are no wind farms in South Africa and therefore no one actually knows what the impact will be.
<b>Dave Young</b>	Asked for another month to 6 weeks to review the EIR and send comments	(BR) CES will extend until the review period until the 11 <sup>th</sup> June 2012
<b>Orgie Crous</b>	Wants to know what the benefits are to the surrounding farms	(Zubin) <ul style="list-style-type: none"> <li>- Surrounding landowners will benefit from the financial investment in Grahamstown</li> <li>- There will be an increase in property value and job opportunities</li> <li>- Grahamstown will be seen as supporting sustainable energy</li> </ul>
<b>Pieter Moll</b>	What happens to the energy generated by the turbines?	(ZUBIN) – gets sold to Eskom
<b>Dave Young</b>	Concerned about the weight that CES has when signing the document Worried that the specialist reports are flawed	(BR) Explained that CES is an independent consulting company and that they are obliged to follow the South African legislation which they have done throughout the process. The only thing that carries weight is the quality of the report.
<b>Dave and Peter</b>	Requested a photomontage	(JS) to organise (BR) Asked Dave to identify two points where he will be visually impacted (JS) asked Peter to send GPS co-ordinates of where they want the picture taken from
<b>Murray Crous</b>	What other wind farms are going ahead in the area	(JS) listed Waainek and a few proposed wind farms that are currently on the table – Cookhouse, Riebeek East
<b>Pieter Moll</b>	Will we have access to the final EIR?	(BR) It is CES's job to record all the I&AP's comments, address them and include them in the final EIR together with the specialist reports and management plan. CES are not obliged to make the EIR available for public consultation but the report can be made available on the website and in public libraries for I&AP's to read. CES can ask Zubin if he wants another comments and response trail before the EIR is submitted.
<b>Petra Crous</b>	Asked about the monitoring of the birds, bats and wind	(BR) Each monitoring program is over a period of 12 months

<b>Murray Crous</b>	The noise assessment only deals with the impact on humans. Has a study been done on the impact on the wildlife?	(JS + BR) We don't know as there are no studies that have been done. Jadon asked Murray to specify the fauna he is concerned about.
<b>Murray Crous</b>	Are we able to get the prevailing wind direction and speed?	(BR) There is a mast in place that is gathering this information which can be made available at the end of the 12 month data collection period
<b>Murray Crous</b>	Can we have a noise reading taken from the lodge	(BR) No problem
<b>Murray Crous</b>	Can the visual impact specialist qualify his statement relating to the N2 and the trees?	(BR) No problem
<b>Orgie Crous</b>	Who does Peynes Kraal and Jakkels Draai belong to?	(Jadon) We can look into that and let you know
<b>Closing of Meeting (BR)</b>		

## APPENDIX D-11: REGISTER OF INTERESTED AND AFFECTED PARTIES

NAME	OCCUPATION/AFFILIATION	CONTACT				PHYSICAL/POSTAL ADDRESS
		Telephone	Mobile	Fax	Email	
<i>Immediate Landowners</i>						
Gavin Dixon	Farmer. Gilead Farm	466227758	847675097	866975204	<a href="mailto:gbd@geenet.co.za">gbd@geenet.co.za</a>	POBox 6292 Grahamstown, Market Square 6141 (owns farm but does not reside there)
Morne and MardaErwee	Tower Hill Farm		0823007730 (Morne)		<a href="mailto:jmichau@zazu.co.za">jmichau@zazu.co.za</a>	Fairview farm, Koondesvalley, Grahamstown
Wayne Nortier	Peynes Kraal Farm	466 361 810	823193207 (Wayne) 0795274335 (Felicity)		<a href="mailto:waynenortier@gmail.com">waynenortier@gmail.com</a> <a href="mailto:felicity@deklerk-devilliers.co.za">felicity@deklerk-devilliers.co.za</a>	POBOX 19 Grahamstown 6139 / Hourkers farm Albany District Grahamstown
<i>Surrounding Landowners</i>						
Glyn Dixon	Chairman - Coomb Farmers Association	466 227 776	727 641 303	866 204 765	<a href="mailto:claypits@geenet.co.za">claypits@geenet.co.za</a>	
Orgie Crous	Farmer - Honeykop No361	466228474	826609974	466228474	<a href="mailto:ebackloads@yahoo.com">ebackloads@yahoo.com</a>	PO BOX 362, Grahamstown, 6140
Jeremy Allan			827846805		<a href="mailto:jjrallan@yahoo.com">jjrallan@yahoo.com</a>	17 Milner str Grahamstown
Gilbert Coetzee	Coombesvale		828085961		<a href="mailto:gmd@geenet.co.za">gmd@geenet.co.za</a>	POBOX 2204 Grahamstown 6140
James Williamson	Glenvoid		824412055		<a href="mailto:james@geenet.co.za">james@geenet.co.za</a>	45 Kingsview Estate Miles rd Grahamstown
Andre Coetzee			826592710		no email address	POBOX 267 GHT
Fred Pittaway	Valleyview and Kaasvlei (sp.?)	466223663	834792762		<a href="mailto:valleyview@xsinet.co.za">valleyview@xsinet.co.za</a>	POBOX 2225 GHT
Gcobani Dyantyi	Outspan Farm		826378632		<a href="mailto:amangwevu@yahoo.com">amangwevu@yahoo.com</a>	262B Grahamstown
<i>Government</i>						
Mr Briant Noncembu	DEDEA (Amathole)				<a href="mailto:Briant.Noncembu@deaet.ecape.gov.za">Briant.Noncembu@deaet.ecape.gov.za</a>	Private Bag X5029 Mthatha 5099
Carin Swart	DEDEA				<a href="mailto:Carin.Swart@deaet.ecape.gov.za">Carin.Swart@deaet.ecape.gov.za</a>	
Dan Malgas	DAFF Forestry				<a href="mailto:MalgasM@daff.gov.za">MalgasM@daff.gov.za</a>	
S. Gwen	DAFF Forestry	(043) 604 5301			<a href="mailto:gwendolines@daff.gov.za">gwendolines@daff.gov.za</a>	
Anneliza Collett	DAFF Agri				<a href="mailto:annelizac@nda.agric.za">annelizac@nda.agric.za</a>	
M Mathekgana	Dept of Energy	(012) 444-4261			<a href="mailto:mokgadi.mathekgana@energy.gov.za">mokgadi.mathekgana@energy.gov.za</a>	
Ms Nyiko Nkosi	DEA				<a href="mailto:nkosi@environment.gov.za">nkosi@environment.gov.za</a>	Private Bag X447, Pretoria, 0001
<i>Municipality</i>						
Ntonek Nocweka	Makana Municipality		072 8195472		<a href="mailto:ntontela@makana.gov.za">ntontela@makana.gov.za</a>	
Anele Kwayimani	Makana Municipality	046 622 9186	083 6955 406	046 603 6062	<a href="mailto:anele.kwayimani@webmail.co.za">anele.kwayimani@webmail.co.za</a>	
Xhanli Bokue	Makana Municipality		083 335 4843		<a href="mailto:bokwe@makana.gov.za">bokwe@makana.gov.za</a>	
Casa Yonela	Makana Municipality		072 13302 92		<a href="mailto:casayo@webmail.co.za">casayo@webmail.co.za</a>	
Mzomhle Radu					<a href="mailto:radu@makana.gov.za">radu@makana.gov.za</a>	
<i>Key Stakeholders</i>						
NannaGouws	SANRAL				<a href="mailto:GouwsJ@nra.co.za">GouwsJ@nra.co.za</a>	
MariagraziaGalamberti	SAHRA				<a href="mailto:mgalimberti@sahra.org.za">mgalimberti@sahra.org.za</a>	
XolaniWana	ESKOM				<a href="mailto:Xolani.Wana@eskom.co.za">Xolani.Wana@eskom.co.za</a>	
Lizelle Stroh	SACAA				<a href="mailto:strohl@caa.co.za">strohl@caa.co.za</a>	
Irene de Moor	WESSA				<a href="mailto:irenedemoor@imagnet.co.za">irenedemoor@imagnet.co.za</a>	
Jenny Gon	WESSA				<a href="mailto:j-gon@intekom.co.za">j-gon@intekom.co.za</a>	PO Box 73, Grahamstown, 6140
<i>Registered IAPs</i>						
P. de Klerk			828093425	466 223 118		PO Box 160, Grahamstown, 6140
M.S Miller			825921664			
P. Mini		466 227 222			<a href="mailto:p.mini@grocotts.co.za">p.mini@grocotts.co.za</a>	40 High St, Grahamstown
Rob Cooper		466 225 753	827471888		<a href="mailto:robc@terrapower.co.za">robc@terrapower.co.za</a>	PO Box 73, Grahamstown
Dave de La Harpe	Landowner (Fort Governor's Estate)				<a href="mailto:groupofadvocates@roundbar.co.za">groupofadvocates@roundbar.co.za</a>	
Dave Young	Landowner		082 7791372		<a href="mailto:davey@datimbers.co.za">davey@datimbers.co.za</a>	

Volume 3: Environmental Impact Report

Pieter Moll	Landowner (Trumpeters Drift Farm)	466225731	0828041669	466368901	<a href="mailto:aaacm@intekom.co.za">aaacm@intekom.co.za</a>	P.O. Box 6105, Market Square, Grahamstown 6141
Adri Timm	Landowner (Huntshoek Lodge & Safari's)	466225984	0836318714	0865125234	<a href="mailto:adrit@vincemus.co.za">adrit@vincemus.co.za</a>	

## APPENDIX E: COPIES OF TITLE DEEDS

**3. REMAINDER OF THE FARM GILEAD NO. 361, Division of Albany;**

**IN EXTENT: 647,9094 (Six Hundred and Forty Seven Comma Nine Nought Nine Four) hectares**

**FIRST REGISTERED** by Deed of Grant dated 1st August 1841 (Albany Quitrents Vol. 5 No. 11) with diagram annexed held by Deed of Transfer No. T11668/1964.

**REMAINDER FARM TOWER HILL NO 363  
IN THE MAKANA MUNICIPALITY  
DIVISION OF ALBANY, EASTERN CAPE PROVINCE**

**IN EXTENT: 787,9737 (SEVEN HUNDRED AND EIGHTY SEVEN COMMA NINE SEVEN THREE SEVEN) Hectares**

**FIRST REGISTERED** by Deed of Grant No. 150/1935 with diagram No. B453/1928 relating thereto and held by Deed of Transfer No. T35192/1986

**REMAINDER OF THE FARM PEYNES KRAAL NO. 362, Division of Albany, in the Province of Eastern Cape**

**IN EXTENT: 724,6783 (Seven Hundred and Twenty Four Comma Six Seven Eight Three) hectares**

**FIRST REGISTERED** by Deed of Grant No. 62 dated 12th May 1936 with diagram annexed thereto and held by Deed of Transfer No. T25448/1977.

**APPENDIX F: COPY OF WATER AVAILABILITY FROM DWA**



**water affairs**

Department:  
Water Affairs  
**REPUBLIC OF SOUTH AFRICA**

P O BOX 7019 EAST LONDON 5200

☎ (043) 701 0376

Enquiries: B. Kama

E-mail: kamab@dwa.gov.za

FAX : (043) 722 6152

Ref: 27/2

Plan 8 Infinite Energy (Pty) Ltd  
100 New Church Street  
**CAPE TOWN**  
8001

**Attention:** Mr. Zuben Jessa

Dear Sir

**NON BINDING CONFIRMATION OF THE WATER AVAILABILITY FOR A WIND FARM IN GRAHAMSTOWN ON REMAINDER OF FARM 363 ALBANY DIVISION**

The Department of Water Affairs would like to confirm that your water demand for a planned Wind Farm in Grahamstown, for a one and a half year construction period, can be accommodated.

The total yield of 20379 m<sup>3</sup> of water for the 18 month construction phase and potable water use from the borehole can be supplied.

Your co-operation aimed at the protection of water resources will be highly appreciated

If you have any queries please do not hesitate to contact this office.

Yours faithfully

**ACTING CHIEF DIRECTOR: EASTERN CAPE**

DATE: 17/02/2012



## APPENDIX G: LETTER FROM ESKOM CONFIRMING ABILITY TO CONNECT FACILITY



**Mr Zuben Jessa**  
**Project Co-Ordinator**

Date: 12 September 2011

Plan 8 Infinite Energy (Pty) Ltd  
81 Church Street  
**CAPE TOWN**  
8001

**Enquiries:** Sanette Worthington  
**Tel :** +27 41 9948701

**Ref No :** 45299083

E-mail: [zuben.jesse@plan-8.co.za](mailto:zuben.jesse@plan-8.co.za)

Dear Mr Jessa

### **COST ESTIMATE LETTER FOR THE CONSTRUCTION OF WORKS TO CONNECT A GENERATOR TO THE DISTRIBUTION SYSTEM FOR GRAHAMSTOWN WIND FARM**

Thank you for your application dated 01 February 2011 relating to the construction of works to connect your generation Facility, situated at Wolf sub-station to the Eskom network, and/or the possible impact on Eskom's network of connecting your generator that is embedded within a plant. Eskom has assessed your requirements and herewith provides an estimate of the cost of providing the works and connection. It is based on engineering assumptions and provided in order to assist in making a decision whether or not you should proceed to request a budget quotation.

This letter is not an offer for a contract. It is purely illustrative and in anticipation of a request for a budget quotation. No information contained in this letter shall be deemed to form part of any contract between Eskom and any party.

Furthermore, if based on this letter you request a budget quotation, any information recorded in this cost estimate letter will lapse immediately (even if a budget quotation is eventually not provided or accepted) and Eskom will not be bound to perform in terms of it in any way.

Eskom will require certain documents and approvals, set out herein, and payment of a quotation fee in order to provide a budget quotation.

### **1. DEFINITIONS AND INTERPRETATION**

The words and expressions in this document shall have the meanings ascribed to them in the South African Grid Code and the Distribution Code, each as amended from time to time. These documents are obtainable from the National Energy Regulator of South Africa's website. Log onto [www.nersa.org.za](http://www.nersa.org.za) and then follow the link to 'Electricity' and then to 'Technical Standards'.

The following capitalised words and expressions shall have the meanings as assigned to them and cognate expressions shall have corresponding meanings:

Eastern Cape Operating Unit - Distribution  
Management  
Cnr. of Bonza Bay Road & Quenera Drive, Beacon Bay, 5241, Private Bag X1, Beacon Bay, 5205, SA  
Tel 043 703 2094 Fax 043 703 2412 [www.eskom.co.za](http://www.eskom.co.za)

Eskom Holdings SOC Limited Reg No 2002015527/06

- at or after providing the budget quotation, is payable by you irrespective of whether these approvals are obtained or not.
- 6.2. If you wish Eskom to proceed to provide a budget quotation you are required to complete the "Request for a Budget Quotation" letter, attached to this cost estimate letter as annexure "A" and forward the request together with the quotation fee and other required documentation, to Eskom, within 12 months of the date of signature of this letter.
  - 6.3. Before the Facility is connected to any Eskom system, you will be required to enter into a written Connection and Use-of-System Agreement with Eskom related to the connection of the generator to Eskom's Distribution System. Such agreement shall regulate the terms upon which the Facility may be connected to the system.
  - 6.4. If you intend also to consume electricity at your site, which is to be supplied by Eskom, and you do not have an electricity supply agreement or the terms and conditions of your existing electricity supply agreement will change due to your generation Facility you will be required to sign an electricity supply agreement that will regulate the supply of electricity to the premises. Please contact Sanette Worthington at telephone number (041-9948701) if this is the case.
  - 6.5. You will be liable to pay any taxes and/or levies relating to the subject matter hereof, which may be imposed in terms of any existing and/or future legislation or as approved by NERSA.
  - 6.6. The terms and conditions of this letter are subject to the provisions of the Code, the Electricity Regulation Act (No 4 of 2006) and the rules and regulations issued thereunder, including any rules and regulations pertaining to an electricity conservation or a rationing programme or -scheme, and of Eskom's licences and schedule of standard prices, as amended or re-enacted from time to time and any other applicable laws.
  - 6.7. This information should not be used for anything other than its intended purpose. Eskom accepts no liability, contractual or otherwise, as a result of any reliance on this information and you accordingly indemnify Eskom against any liability emanating from the use of this information.
  - 6.8. Eskom's bank account details for direct deposits or bank transfers are available on request.

Please attach proof of payment to this letter.

For any information, enquiries or confirmation, please contact Sanette Worthington at telephone number 041-9948701.

I thank you for the opportunity of allowing Eskom to provide this service and trust that your favourable written reply will reach this office shortly.

Yours sincerely



MJ Möller  
**GENERAL MANAGER:  
DISTRIBUTION EASTERN CAPE**

.....  
**Date:**

Cc: Customer file