



PROPOSED PLAN8 GRAHAMSTOWN WIND ENERGY PROJECT
GRAHAMSTOWN AREA, MAKANA MUNICIPALITY
EASTERN CAPE PROVINCE OF SOUTH AFRICA

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

DRAFT FOR PUBLIC REVIEW

DEA REFERENCE NUMBER: 12/12/20/2523

<p>Prepared for:</p> 	<p>Prepared by:</p> 
<p>Plan 8 (Pty) Ltd. Infinite Energy</p>	<p>Coastal & Environmental Services</p>
<p>100 New Church St Cape Town, 8001</p>	<p>P.O. Box 934 Grahamstown, 6140 <i>(also in East London)</i></p>
<p>South Africa</p>	<p>South Africa</p>

April 2012

CES Report Revision and Tracking Schedule			
Document Title	Plan 8 Grahamstown Wind Energy Environmental Impact Assessment – Volume 3: Environmental Impact Assessment Report		
Client Name & Address	100 New Church St Cape Town, 8001		
Document Reference			
Status	Draft		
Issue Date			
Lead Author	Jadon Schmidt		
Reviewer	Marc Hardy Bill Rowston		
Study Leader or Registered Environmental Assessment Practitioner Approval	Coastal and Environmental Services		
Report Distribution	Circulated to	No. of hard copies	No. electronic copies
DEA	Ms S. Dlomo	1	1
DEDEA	Mr D. Govender	1	1

This document has been prepared in accordance with the scope of Coastal & Environmental Services (CES) appointment and contains intellectual property and proprietary information that is protected by copyright in favour of CES. The document may therefore not be reproduced, used or distributed to any third party without the prior written consent of Coastal & Environmental Services. This document is prepared exclusively for use by CES's client. CES accepts no liability for any use of this document other than by its client and only for the purposes for which it was prepared. No person other than the client may copy (in whole or in part) use or rely on the contents of this document, without the prior written permission of CES. The document is subject to all confidentiality, copyright and trade secrets rules, intellectual property law and practices of South Africa.



Coastal & Environmental Services

Grahamstown
67 African Street
Grahamstown
6039
+27 46 622 2364/7
Info@cesnet.co.za
www.cesnet.co.za
Also in East London

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

This report should be cited as follows: Coastal & Environmental Services (April 2012). *Draft Environmental Impact Assessment: Proposed Plan 8 Grahamstown Wind Energy Project, Makana Municipality. Volume 3: Draft Environmental Impact Assessment Report.* CES, Grahamstown.

EXECUTIVE SUMMARY

Background

Plan8 (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, situated approximately 30km east of Grahamstown. The project areas lies in the Makana Local Municipality’s area of jurisdiction, part of the Cacadu District Municipality. 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 Plan8 (Pty) Ltd, the motivation for the proposed project arose from the following potential benefits:

- **Electricity supply**

The establishment of the proposed Plan8 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. Plan8 (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 into which the electrical cables will be connected to 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 Plan8 Grahamstown Wind Energy project study area is depicted in Figure 1 below.

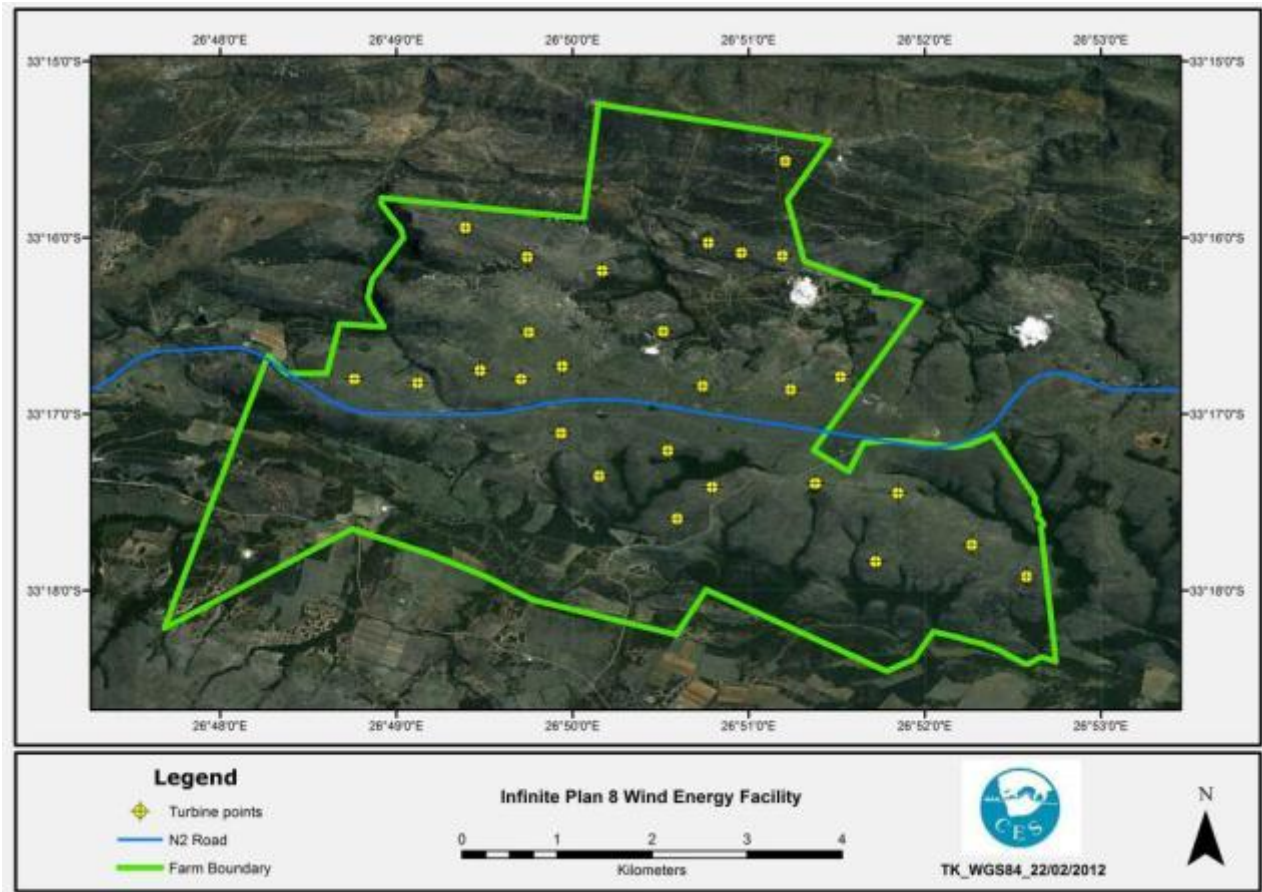


Figure 1: The proposed Plan8 Grahamstown wind energy project, 30km north-east of Grahamstown

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 Plan8 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 0m blades) with rotor diameters of 100 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 grid. Typically, the development of the wind farm is divided into various phases:-

- *Pre-feasibility:* Plan8 (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:* Plan8 (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 Plan8 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: A temporary area of 35mX25m 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 = 13 weeks (including 8 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 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 overall construction timeframes and sequencing:

- Financial close 13 Dec 2013
- Bird and Bat monitoring 13 Dec 2014
- Construction starts February 2015 and ends Dec 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 within a prescribed geographical area - province), 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 are listed in Table 1 below.

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	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	<p>The construction of:</p> <ul style="list-style-type: none"> (i) canals; (ii) channels; (iii) bridges; (iv) dams; (v) weirs; (vi) bulk storm water outlet structures; (vii) marinas; (viii) jetties exceeding 50 square metres in size; (ix) slipways exceeding 50 square metres in size; (x) buildings exceeding 50 square metres in size; or (xi) infrastructure or structures covering 50 square metres or more <p>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.</p>
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"> (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; <ul style="list-style-type: none"> (a) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or (b) occurs behind the development setback line.
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	<p>The expansion of</p> <ul style="list-style-type: none"> (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 <p>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.</p>

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 recently 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 Plan8(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 jurisdictions of the Makana Local Municipality (MLM) and the Ndlambe Local Municipality (NLM), the project will affect these municipal communities. 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) Palaeontological

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 for each of the above-mentioned specialist studies, which outline the information required from each of the specialists, are outlined in Chapter 7 of this report.

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) of the suite of documents for the proposed project.

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 Section 7.2 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
Telecommunication Interference: Vodacom Mast	The proposed development takes place near to and surrounds a Vodacom Telecommunication mast. Will the turbines have any implications and interference on the electronic broadcasting from this mast?
Socio-economic: Ecotourism	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.
Visual Intrusion	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.

Avifauna and bats	There are potential negative impacts on large bird populations via loss of useable habitat.
--------------------------	---------------------------------------------------------------------------------------------

Mr Murray Crous, owner of Settlers Safaris hunting outfit and Bushmans Gorge Lodge situated on Honeykop Farm, a neighbouring farm to the proposed Plan8 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 Appendices B-8 and 9 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.

In addition, issues raised during the public meeting are provided in Appendix B-7 as meeting minutes.

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 tops of slopes of 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. 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 50 metre 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.

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.

Palaeontological 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

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 000m of the nearest wind turbine (according to the most recent development layout) and shadow flicker may affect residents of these buildings for more than 30 hours per annum. 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.

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 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 Noise produces 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. 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.

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 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 make 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 3, 4 and 5 below provide a summary of the impacts associated with the proposed Plan8

Grahamstown Energy Project as a whole, with and without mitigation.

DRAFT

Table 3: 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 4: 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	Collision of birds with turbines	MOD-	MOD-
	3	Disturbance and displacement of avifauna	LOW-	LOW-
	4	Disruption of local bird movement patterns	MOD-	N/A
	5	Collision and electrocution of birds with power lines	MOD-	LOW-
Bat	6	Bat mortalities during foraging by turbine blades	HIGH-	MOD-
	7	Bat mortalities during migration by turbine blades	HIGH-	MOD-
Heritage	8	Impact on heritage resources	MOD-	LOW-
Noise	9	Predicted noise levels for wind turbine generators	HIGH-	LOW-
Visual	10	Potential landscape impact	MOD-	MOD-
	11	Impact of shadow flicker on residents in close proximity to wind turbines	Refer to specialist report	
Agriculture	12	Possible change of use of agricultural land	MOD-	LOW-

Table 5: 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-
	Avifauna	12	Habitat destruction	N/A
		13	Disturbance of birds	N/A

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

OPERATIONAL	Ecological	1	Invasion of alien species	HIGH-
	Avifauna	2	Collision of birds with turbines	N/A
		3	Disturbance and displacement of avifauna	N/A
		4	Collision and electrocution of birds with power lines	N/A
		Bat	5	Bat mortalities during foraging by turbine blades
	Bat	6	Bat mortalities during migration by turbine blades	N/A
	Heritage	7	Impact on heritage resources	MODERATE+
	Agriculture	8	Not proceeding with wind farm construction	MODERATE-
	Noise	9	Predicted noise levels for wind turbine generators	MODERATE+
	Visual	10	Potential landscape impact	MODERATE+
		11	Impact of shadow flicker on residents in close proximity to wind turbines	Refer to specialist report

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;
- The nature of the site on which the facility is to be sited is suited to the development proposal;
- 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 Municipality (MM), and
- The project will contribute directly and significantly to social upliftment of the local community.

Based on the above, it is believed that, with the implementation of appropriate mitigation measures, the benefits of the proposed Plan8 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 Plan8 Grahamstown Wind Energy Project should be granted authorisation.

The opinion of the EAP was also influenced by the fact that 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 MM'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 10 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.

The Way Forward – Environmental Authorisation Phase

Following public review, this Draft EIR, together with the Specialist Volume (Volume 2) and the EMP (Volume 4), will be amended as necessary and finalised, incorporating any comments received. It will then 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.

TABLE OF CONTENTS

1 INTRODUCTION..... 1

1.1 Background to the study 1

1.2 The Environmental Impact Assessment Process 1

1.3 The Environmental Assessment Practitioner 8

2 PROJECT DESCRIPTION 14

2.1 Location and site description of the proposed development..... 14

2.2 Detailed description of the Plan8 Grahamstown Wind Energy project..... 14

 2.2.1 Turbine specifications 14

 2.2.2 Additional Infrastructure requirements 16

 2.2.3 Construction Phase 22

 2.2.4 Operational phase 25

 2.2.5 Refurbishment and rehabilitation of the site after operation 25

3 DESCRIPTION OF THE AFFECTED ENVIRONMENT 26

3.1 The Bio-physical Environment 26

 3.1.1 Climate and Hydrology 26

 3.1.2 Topography 26

 3.1.3 Geology and Soils..... 27

3.2 Vegetation and Floristics 28

 3.2.1 Species of Special Concern (SSC) 30

 3.2.2 Alien invasive species..... 30

 3.2.3 Regional Vegetation 30

 3.2.4 Subtropical Thicket Ecosystem Planning (STEP) Project..... 35

 3.2.5 Vegetation of the study area 38

3.3 Fauna 39

 3.3.1 Habitats 39

 3.3.2 Vertebrates..... 39

 3.3.3 Animal species of special concern 40

3.4 Terrestrial Invertebrates..... 40

3.5 Land Use and the Eastern Cape Biodiversity Conservation Plan (ECBCP) 40

3.6 Heritage characteristics 44

 3.6.1 Archaeology and heritage structures 44

3.7 Palaeontology..... 45

3.8 Socio-economic profile 45

4 NEED AND DESIRABILITY ASSESSMENT 49

5 ALTERNATIVES 50

5.1 Fundamental alternatives 50

5.2 Incremental alternatives..... 50

5.3 Design/Layout Alternatives 51

5.4 Technology Alternatives 51

5.5 Scheduling Alternatives 51

5.6 The ‘NO-GO’ alternative 51

6 KEY FINDINGS OF THE SPECIALIST STUDIES..... 52

6.1 Ecological Impact Assessment 52

6.2 Avifauna Impact Assessment..... 54

6.3 Bat (Chiroptera) Impact Assessment 55

6.4 Heritage Impact Assessment..... 56

6.5 Palaeontological Impact Assessment 57

6.6 Visual Impact Assessment..... 58

 6.6.1 Visibility 58

 6.6.2 Shadow Flicker..... 63

6.7 Noise Impact Assessment 64

 6.7.1 Predicted Noise Levels for the Construction Phase 64

 6.7.2 Predicted noise levels for the Operational Phase..... 66

6.8 Agricultural Assessment 68

6.9	Geotechnical Assessment	68
7	IMPACT ASSESSMENT	70
7.1	Construction Phase Impacts	70
7.1.1	<i>Flora and Vegetation</i>	70
7.1.2	<i>Avifauna</i>	77
7.1.3	<i>Bats (Chiroptera)</i>	78
7.1.4	<i>Archaeology</i>	79
7.1.5	<i>Noise</i>	80
7.1.6	<i>Visual</i>	83
7.1.7	<i>Agriculture</i>	86
7.2	Operational Phase Impacts	88
7.2.1	<i>Flora and Vegetation</i>	88
7.2.2	<i>Avifauna</i>	89
7.2.3	<i>Bats (Chiroptera)</i>	92
7.2.4	<i>Archaeology</i>	95
7.2.5	<i>Noise</i>	96
7.2.6	<i>Visual</i>	100
7.2.7	<i>Agriculture</i>	101
7.2.8	<i>Socio-Economic Impact Assessment</i>	102
8	CONCLUSIONS AND RECOMMENDATIONS	105
8.1	Summary of the Key Findings of the EIA	105
8.2	EAP’s Recommendation.....	112
8.3	The Way Forward.....	120

DRAFT

LIST OF FIGURES

Figure 1-1: The EIA process under current legislation (NEMA 1998) as amended	5
Figure 2-1: Locality map indicating the location of the proposed Plan8 Grahamstown Wind Energy Project.	20
Figure 2-2: Site Layout Plan indicating turbines, roads, powerline, substation and project cabling connections. Concrete foundations to support the wind turbine towers.	21
Figure 2-3: Illustration of the main components of a typical wind turbine (note that the transformer can be located inside the tower section of each turbine)	22
Figure 2-4: The main dimensions for the foundation of a 3MW/100m high wind turbine	23
Figure 2-5: Assembly and erection of the tower sections	24
Figure 3-1: Simplified geological map of the area around Grahamstown. Adapted from 1:250 000 scale sheet 3326 Grahamstown. <i>Source: Jacob et al. (2004)</i>	28
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 (<i>From van Wyk and Smith 2001</i>).	29
Figure 3.3: Mucina and Rutherford vegetation map of the study area.	34
Figure 3-4: STEP vegetation map of the study area.	37
Figure 3-5: CBAs occurring in and around the proposed project area.	42
Figure 3-6: Map of the study area in relation to corridors and protected areas as described	43
by the MBCP	43
Figure 3.7: Employment statistics for the Makana Municipality and the Eastern Cape. Error! Bookmark not defined.	
Figure 3.8: Household incomes in the Makana Municipality	Error! Bookmark not defined.
Figure 8-1: Map of the proposed wind energy facility showing the varying sensitivity of the site	53
Figure 8-2: Avifaunal sensitivity map for the proposed project.	55
Figure 8-3: Bat sensitivity map	56
Figure 8-4: Heritage sensitivity map, indicating the location of the identified heritage sites, with 15m buffer zone.	57
Figure 8-5: 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.	60
Figure 8-6: Visual exposure calculated from visibility and distance from nearest turbine.	62
Figure 8-1: Revised turbine layout including existing/proposed access roads and cable layouts as informed by identified sensitivities	107
Figure 8-2: Bird Sensitive Areas.	108

LIST OF TABLES

Table 1-1: Listed activities potentially triggered by the proposed Plan 8 Grahamstown Wind Energy Project .	1
Table 1-2: The Specialists involved in the EIA Phase	9
Table 1-3: EIA regulation requirements and structure of the report.....	11
Table 2-1: Erf numbers that comprise the farm proposed for Plan8 Grahamstown Wind Energy Project	14
Table 3-1: Summary of the STEP Project conservation priorities, classifications and general rules	35
Table 3-2: Terrestrial Critical biodiversity Areas and Biodiversity Land Management Classes as described by the Eastern Cape Biodiversity Conservation Plan.	41
Table 3-3: Terrestrial BLMCs and Land Use Objectives	41
Table 8.1: Buildings with potential risk of being affected by shadow flicker.....	63
Table 8-2: Typical Construction Noise	64
Table 8-3: Combining Different Construction Noise Sources – High Impacts (Worst Case)	65
Table 8-4: Combining Different Construction Noise Sources – Low Impacts.....	65
Table 8-5: Attenuation by distance for the construction phase (worst case).....	65
Table 8-6: Summary of noise impacts on NSA's at various wind speeds (Nordex N100).....	66
Table 9.1 – Typical types of vehicles and equipment to be used on site (Construction Phase)	81
Table 9.2 - Typical Construction Noise	81
Table 9.3 - Combining Different Construction Noise Sources – High Impacts (Worst Case)	81
Table 9.4 - Combining Different Construction Noise Sources – Low Impacts.....	82
Table 9.5– Attenuation by distance for the construction phase (worst case).....	82
Table 9.6 - Predicted noise levels at the NSA's during the operational phase.....	96

Table 8-1: Summary of the impacts associated with the proposed Plan8 Grahamstown Wind Energy Project during the construction phase 109

Table 8-2: Summary of the impacts associated with the proposed Plan8 Grahamstown Wind Energy Project during the operational phase..... 110

Table 8-3: Summary of the impacts associated with the proposed Plan8 Grahamstown Wind Energy Project assuming the NO-GO option 110

LIST OF PLATES

Plate 3.1: Topography of the site 27

Plate 3.2: Confirmed Species of Special Concern (CSSC). A: *Sideroxylon inerme*(Forest Act), B: *Pelargonium reniforme* (IUCN), C: *Aloe africana* (PNCO, CITES), D: *Aristeaabyssinica*(PNCO), E: *Aloe maculata* (PNCO, CITES), F: *Watsonia* sp(PNCO), G: *Leucospermum* sp (PNCO) and H: *Bobaria orientalis* (PNCO). 31

Plate 3.3: Some alien invasive species. A: *Echinopsisspachiana* (Schedule 1), B: *Eucalyptus grandis*(Schedule 2), C: *Agave americana*(Schedule 2), D: *Opuntiaficus-indica* (Schedule 1) and E: *Acacia mearnsii* (Schedule 2). 32

Plate 3.4: Vegetation types from the study area: A: thicket, B: grassland with evidence of overgrazing, C: degraded thicket and D: grassy fynbos. 38

Plate 9-1: Construction of the existing Coega wind turbine (2km away) 84

Plate 9-2 – Nordex N100 2.5MW Result 12m.s-1 wind speed..... 99

Plate 9-3 – Nordex N90 2.5MW result 12m.s⁻¹ wind speed 100

APPENDICES

APPENDIX A: THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS 125

APPENDIX B: LETTER FROM DEA ACKNOWLEDGING RECEIPT OF THE FINAL SCOPING REPORT AND PLAN OF STUDY 133

APPENDIX C: PLAN OF STUDY SUBMITTED TO DEA 134

APPENDIX D: PUBLIC PARTICIPATION 148

APPENDIX E: COPIES OF TITLE DEEDS 200

LIST OF ACRONYMS AND ABBREVIATIONS

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

1 INTRODUCTION

1.1 Background to the study

Plan8 (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, situated approximately 30km east of Grahamstown. Most of the project areas lies in the Makana Local Municipality's area of jurisdiction, while one farm in the south-west corner of the area is in the Ndlambe LM area. In the present turbine layout, no turbines are situated in the Ndlambe LM 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. 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 Plan8 (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 within a prescribed geographical area - province), 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 are listed in Table 1 below. The activities triggered by the proposed are listed in Table 1-1 below.

Table 1-1: Listed activities potentially triggered by the proposed Plan8 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.

Number and date of the relevant notice	Activity No(s)	Describe each listed activity
Listing Notice 1: R.544	11	<p>The construction of:</p> <ul style="list-style-type: none"> (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 <p>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.</p>
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"> (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; <p><u>(c)</u> is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or</p> <p><u>(d)</u> occurs behind the development setback line.</p>
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	<p>The expansion of</p> <ul style="list-style-type: none"> (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 <p>(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.</p>

Number and date of the relevant notice	Activity No(s)	Describe each listed activity
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 overleaf. 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 recently 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 Plan8 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 3rd November 2011 – 13th December 2011. A detailed description of the Scoping phase for the proposed Plan8 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 are 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 20th January 2012 and acknowledged by the DEA as being received on 26th January 2012 (see Appendix B).

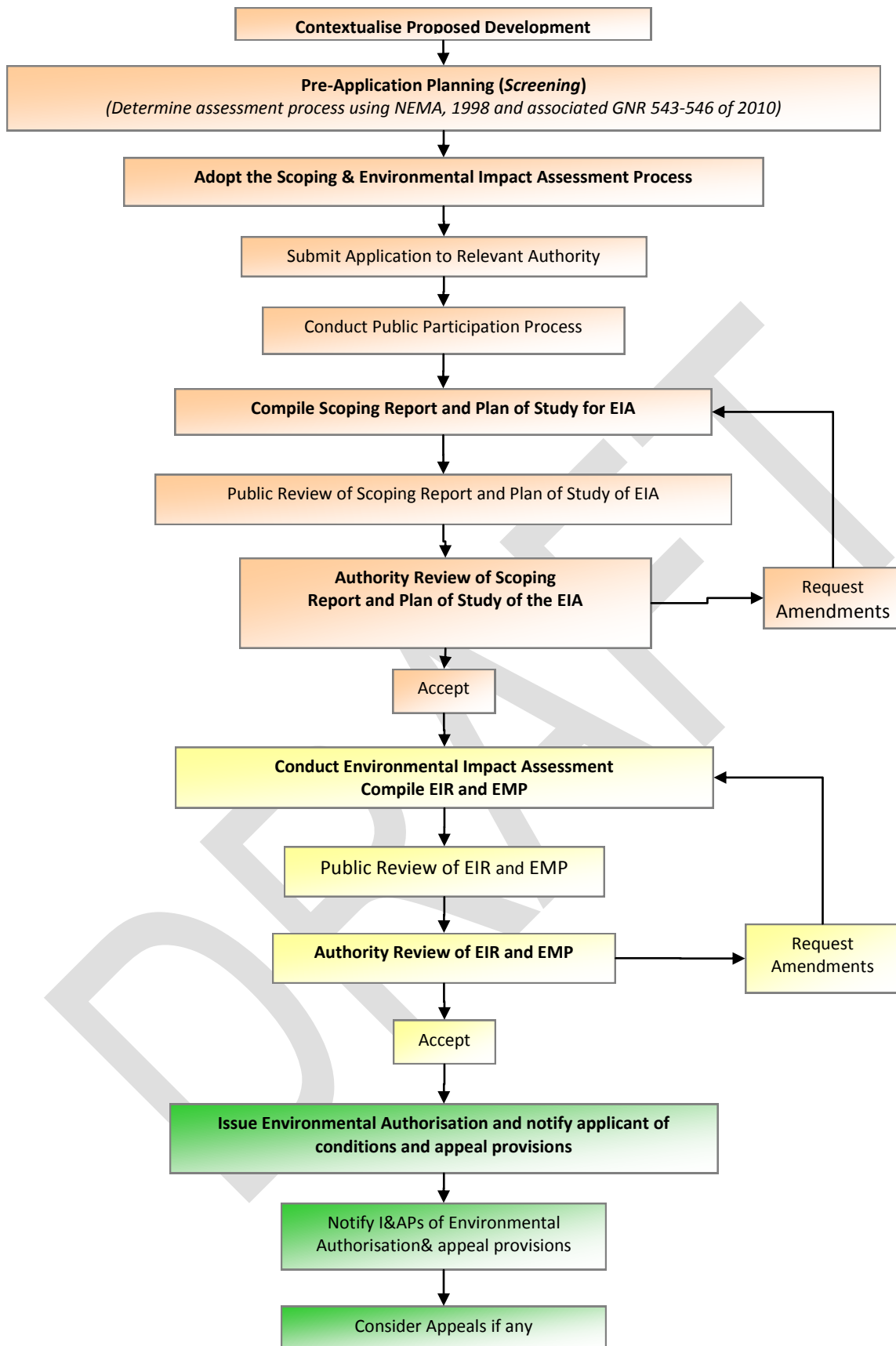


Figure 1-1: The EIA process under current legislation (NEMA 1998) as amended

*** 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 (24th 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 C). CES is releasing the Draft EIR for public review according to the aforementioned approval.

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 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 rounds 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 palaeontological resources is the responsibility of a provincial (or national) heritage resources authority. All archaeological objects, palaeontological 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 will be 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.

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 in watercourse for road access, use of water in the construction or operational phases. Section 21 (c) and (i) authorisations are needed whenever new roads and/or cables cross water courses (even dry headwaters), and when upgrades to existing causeways/bridges (e.g. to allow transportation of long/heavy components and equipment) are required: This 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 DEIR. 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 be approved by the CAA. All necessary permits will be secured 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 comment from the national and/or provincial agriculture departments. This will be secured from the national departments for this project.

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 draft 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

Email: 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 Plan8 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*)

Environmental Consultant/Botanical Specialist. 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 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

Specialist Study	Affiliation	Name of Lead Specialist(s)
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 the five of 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.

Section 1.4.1 provides the detailed structure of this draft EIR, and Section 1.4.2 that follows outlines the limitations and assumptions under which this report was compiled.

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

EIA Regulation Requirements	Section/Chapter
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	Chapter 4 and Appendices
A description of the need and desirability of the proposed activity	Chapter 5
Identification of potential alternatives to the proposed activity	Chapter 6
An indication of the methodology used in determining the significance of potential environmental impacts	Chapter 7
A description and comparative assessment of alternatives	Chapter 6
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 9
A description of any assumptions, uncertainties and gaps in knowledge	Section 1.4.2
An opinion as to whether the activity should or should not be authorised	Chapter 10
An environmental impact statement which contains a summary of the findings and a comparative assessment of the positive and negative implications.	Chapter 10
A Draft 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 – Public Participation Process: Provides details of the public participation process conducted in terms of regulation (32) sub-regulation (1) including –

- Steps undertaken in accordance with the Plan of Study (PoS);
- A list of all persons, organisations and organs of stated that were identified and registered in terms of Regulation 57 as I&APs in relation to the application.
- A summary of the comments received from, and a summary of the issues raised by registered I&APs, the date of receipt of these comments and the response of the EAP to those comments; and
- Copies of any representations, objections and comments received from registered I&APs.

Chapter 5 – Need and Desirability: Provides a description of the need and desirability of the proposed activity including advantages and disadvantages that the proposed activity.

Chapter 6 – Alternatives: Provides a description of the alternatives to the proposed development or parts of the proposed development. It also includes a comparative assessment of viable alternatives.

Chapter 7 – Methodology for Assessing Impacts: Provides an indication of the methodology used in determining the significance of potential environmental impacts.

Chapter 8 – 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 9 – 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 10 – 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.

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

Appendices

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

Volume 4 - Draft Environmental Management Programme: Provides a draft 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 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

2 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 Plan8 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 Plan8 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 Plan8 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) .

2.2 Detailed description of the Plan8 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 Plan8 Grahamstown Wind Energy Project will be spread over three properties in the Grahamstown area of Makana LM, 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 southern section of the farm Tower Hill extends into the Ndlambe LM but there are no turbines located in this portion.

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 account for 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*:

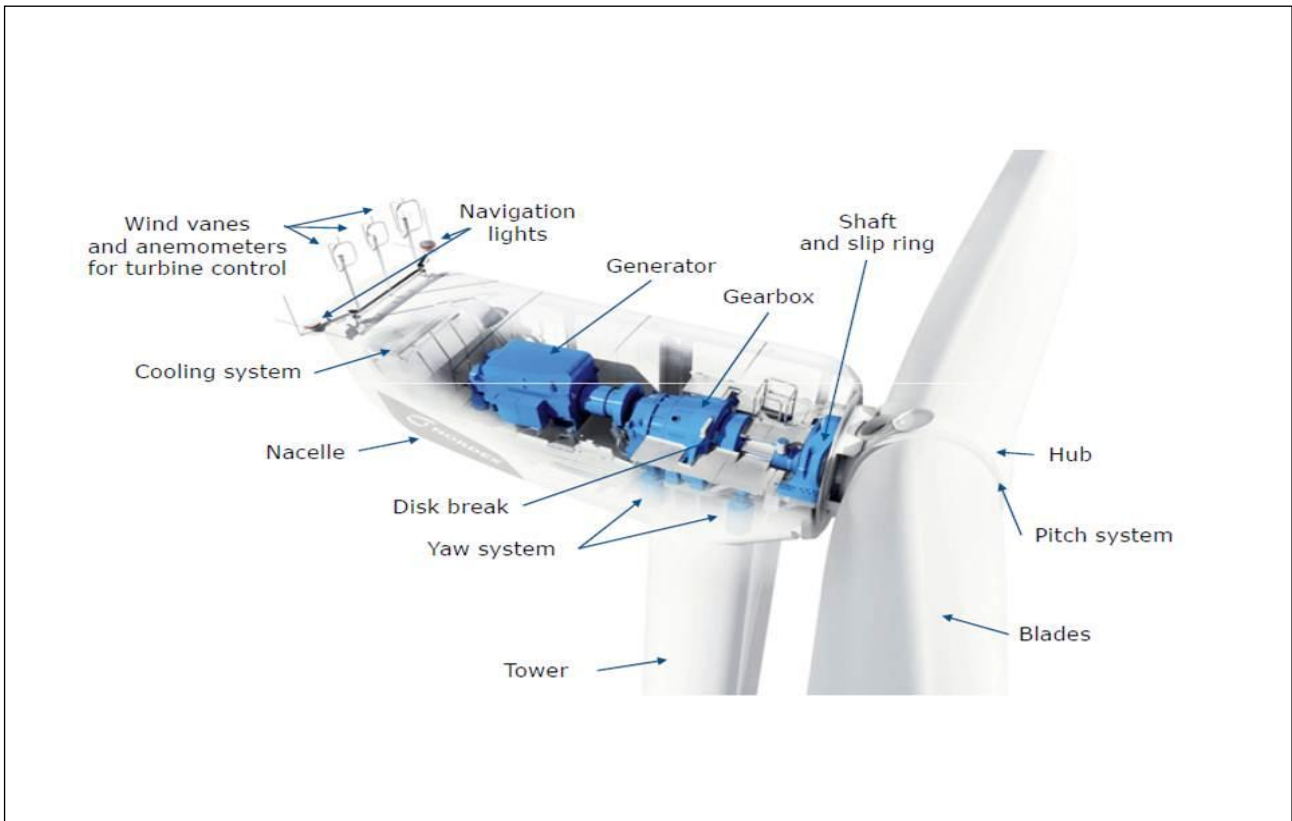


Figure 2-1: Principal components within and attached to the nacelle

- 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 fibreglass 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. The nacelle controls 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 80m, 91m or 100m tall, depending on the selected turbine. Wind has greater velocity at higher altitudes, therefore increasing the height of a turbine increases the expected wind speeds.

- 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 3 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 WTG upon which to stand the crane used for erecting the tower, nacelle and rotor. The diagram below specifies the minimum requirements for the turbines proposed for this facility (Figure 2.2).

2.2.2 Additional Infrastructure requirements

In addition to the above, the following infrastructure will 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 grid.

DRAFT

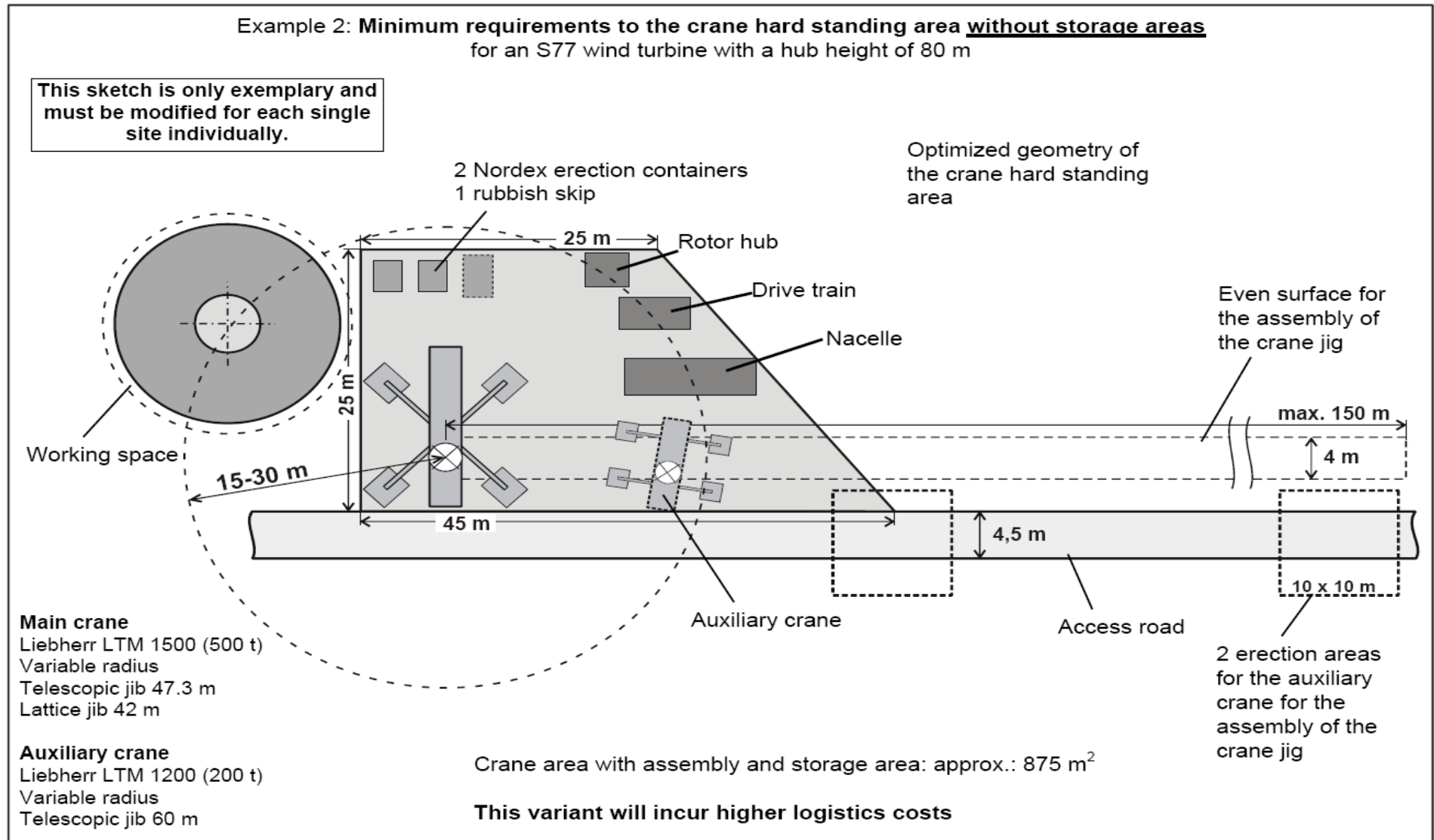


Figure 2-2: Illustration of the floor plan for the crane hardstanding area

(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)

DRAFT

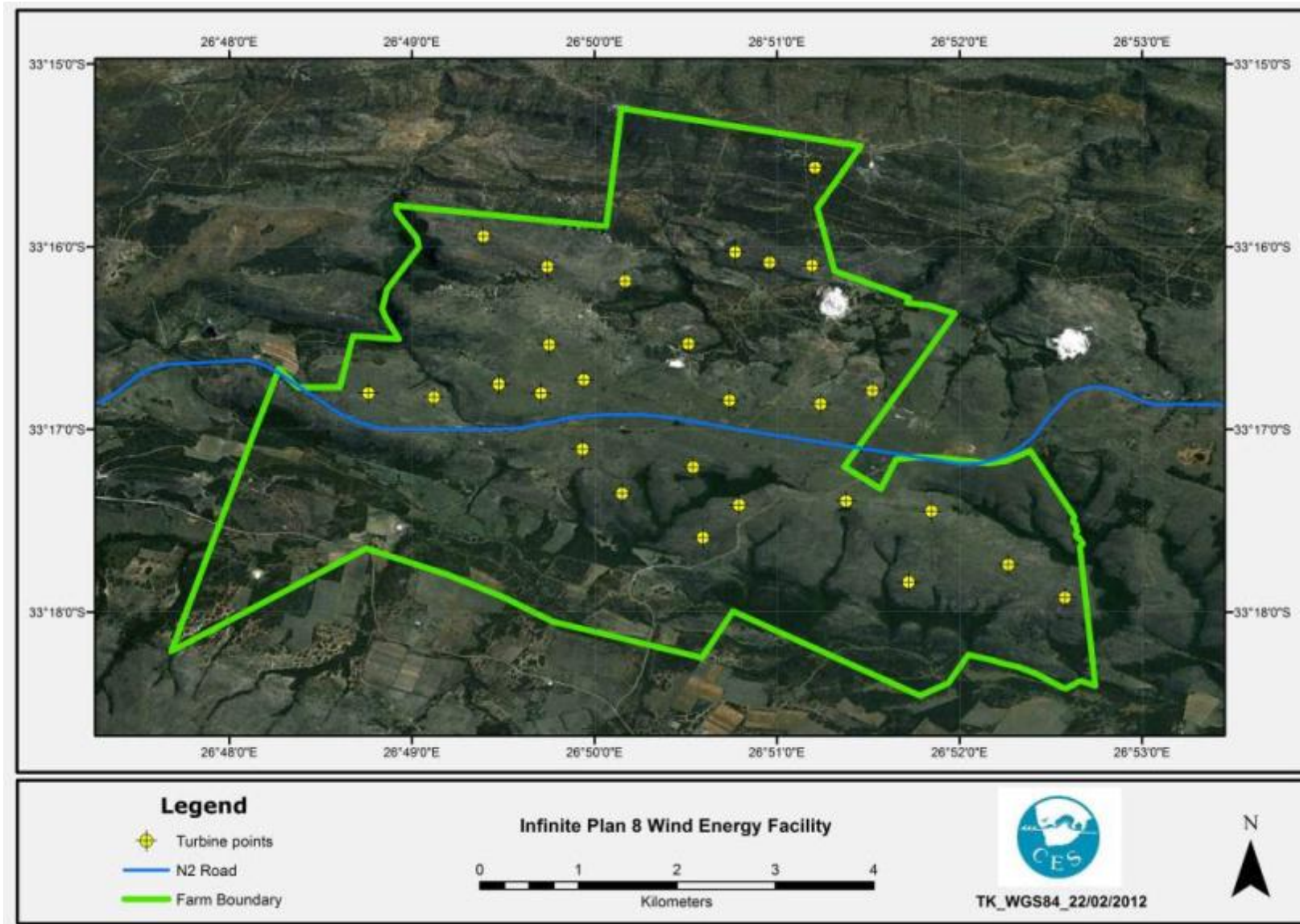


Figure 2-1: Locality map indicating the location of the proposed Plan8 Grahamstown Wind Energy Project.

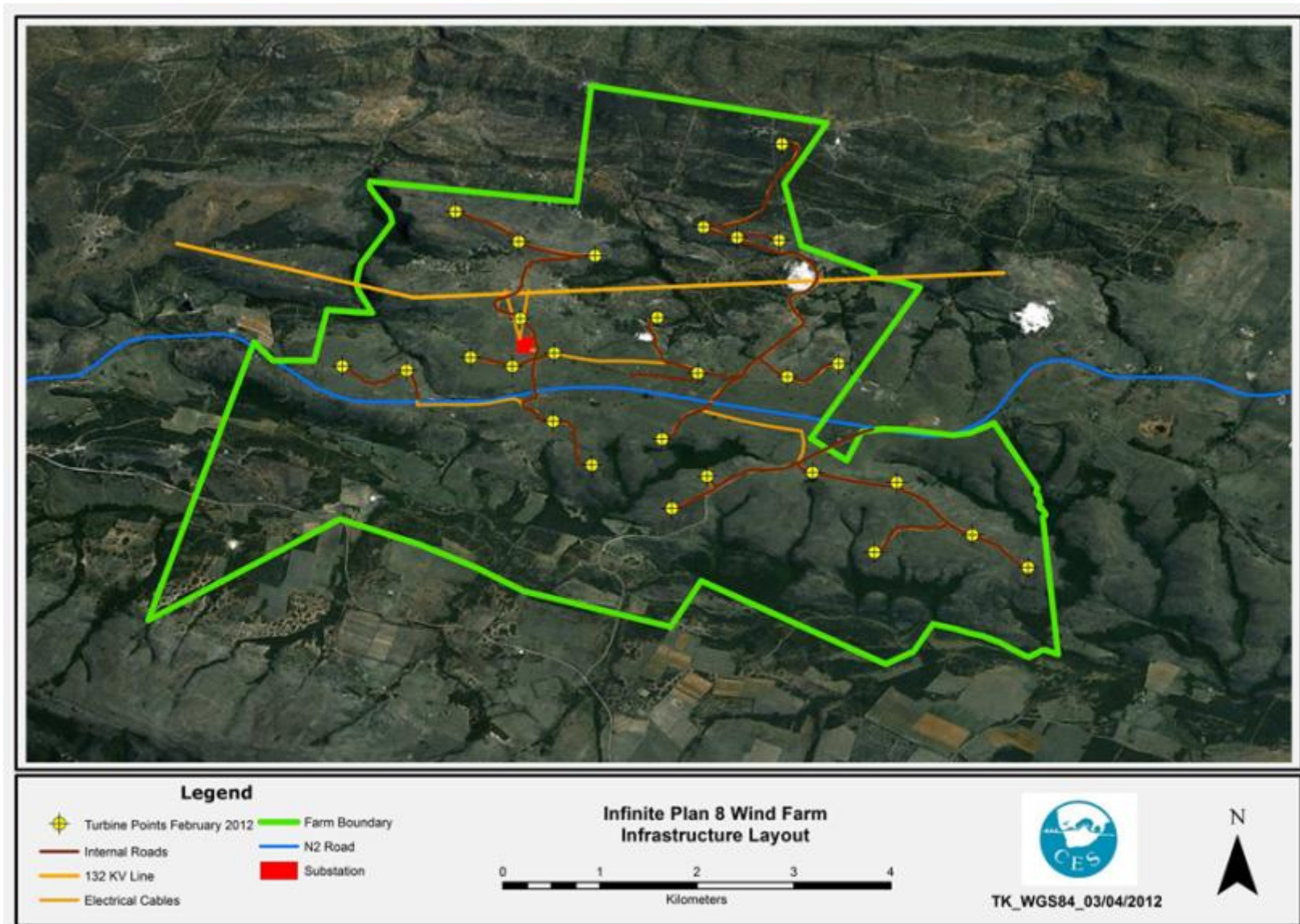


Figure 2-2: Site Layout Plan indicating turbines, roads, powerlines, substation and project cabling connections.

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 drilling, penetration and pressure assessments. Please note that a preliminary 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 500m³ of substrate would need to be excavated for each turbine. These excavations are then filled with steel-reinforced concrete. The foundation design and concrete requirements can vary according to the quality and characteristics of the soil and underlying geology.

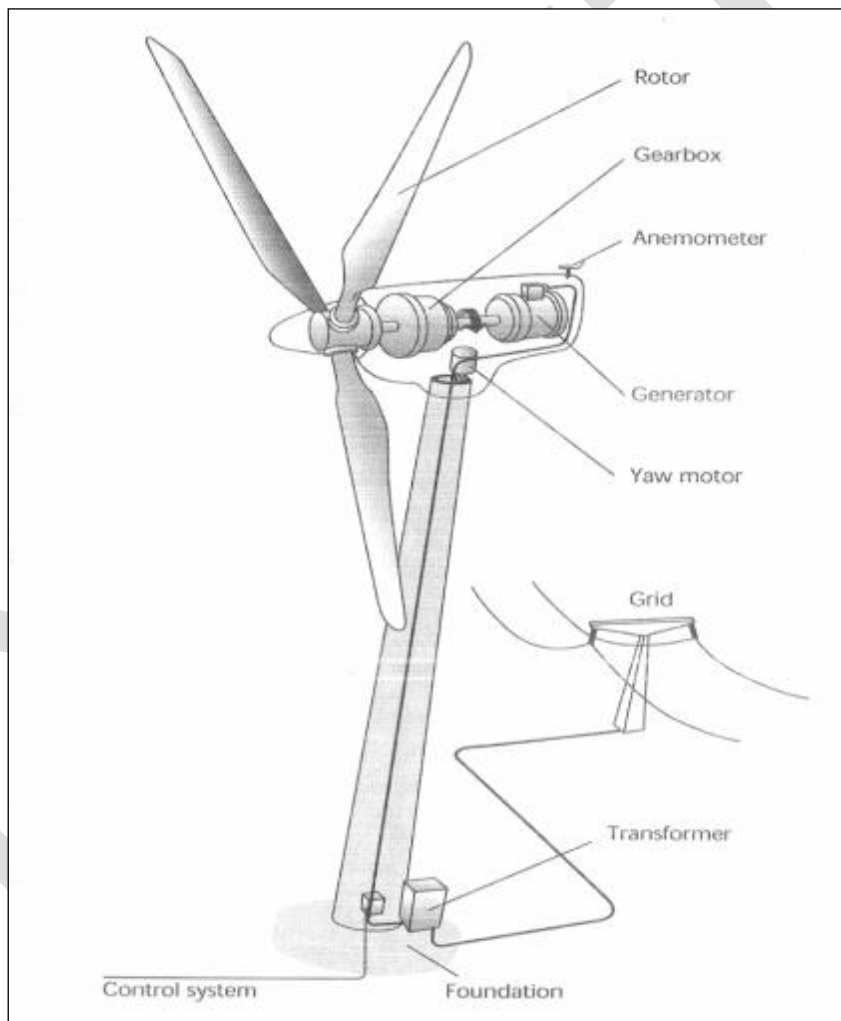


Figure 2-3: Illustration of the main components of a typical wind turbine (note that the transformer can be located inside the tower section of each turbine)

The main dimensions for the foundation of a 3MW/100m high wind turbine are shown in the Figure 2-4 with underground foundation, tower base, above ground foundation, and ground level.

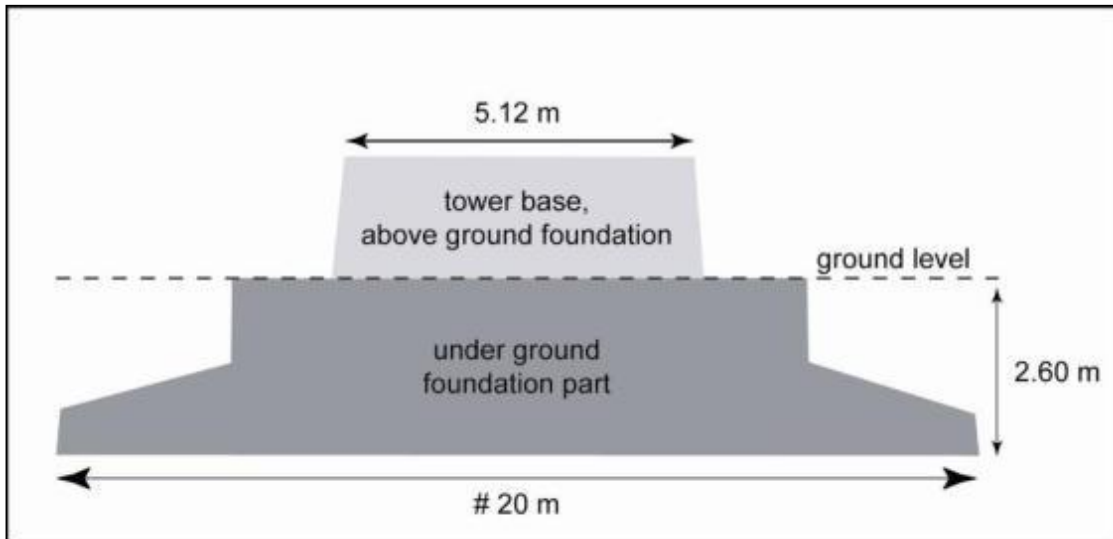


Figure 2-4: The main dimensions for the foundation of a 3MW/100m high wind turbine
(b) Turbine erection

After excavation, foundations need to be laid and the concrete allowed to 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 2-5).

(c) Roads

4.7-6 metre wide internal access roads will connect each turbine, the substation and the N2 highway. These roads cannot be of a gradient of more than 10% 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. More conditions with which internal access roads must comply are the following:

- 5m width with 2m clearance on either side of the road (total of 8m clearance)
- 30cm thick crusher run sub-base and wearing course.
- Curve radius of at least 25m

(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 2-5: 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 2.2) will allow the interconnection of the electricity generated on site into the ESKOM grid.

All electrical and communication cables are run approximately 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. Plan8 have received confirmation of a non-binding agreement of water availability from the Department of Water Affairs to utilise 20 379m³ 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 volume on the roads is 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) and this is the figure that has been used to plan the life span of a modern wind farm. Plan8 (Pty) Ltd undertakes to dismantle all wind turbines and foundations to a depth of 1 metre underground. 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.

DRAFT

3 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 Plan8 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 and Hydrology

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).

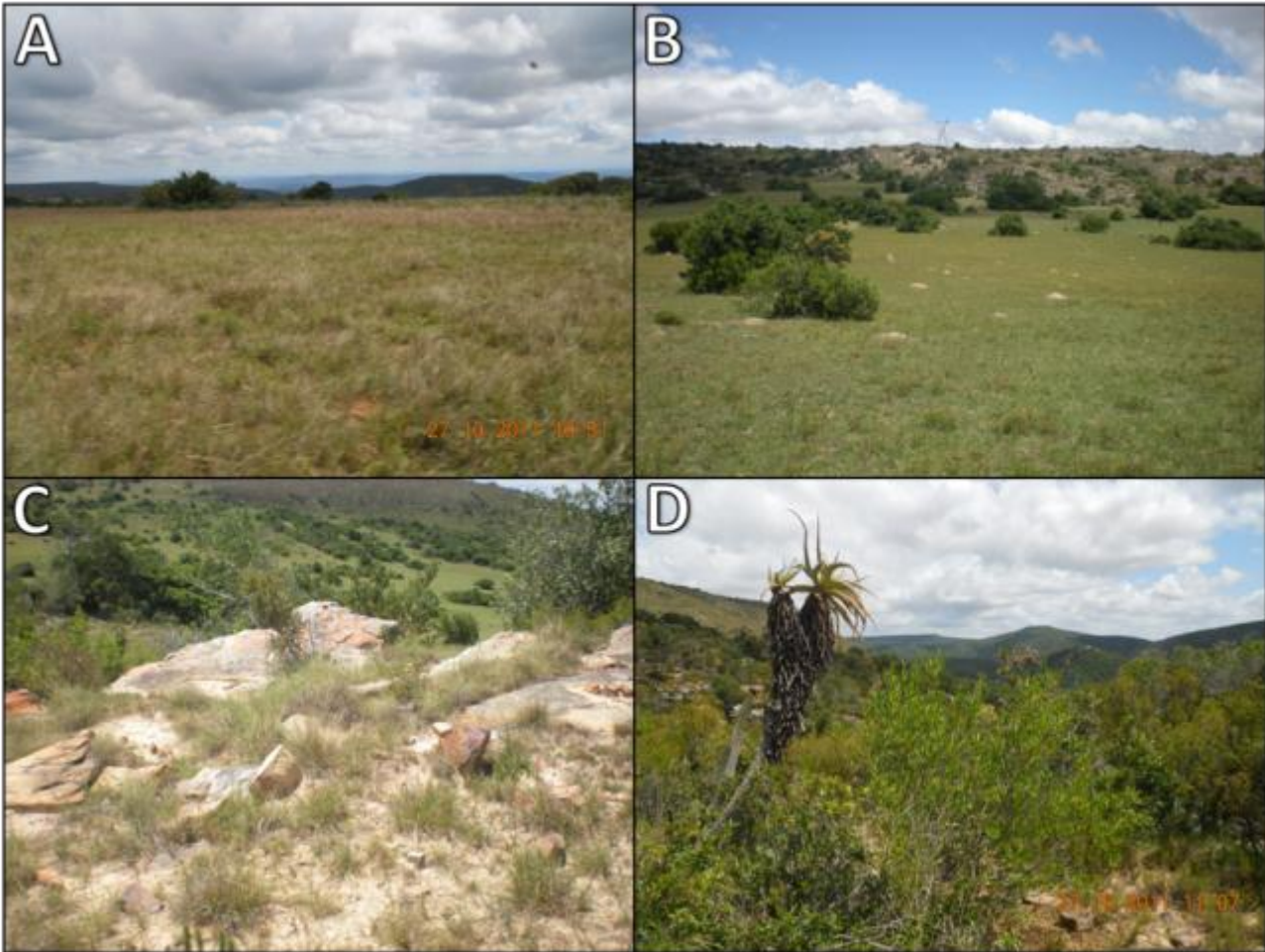


Plate 3.1: Topography of the site

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).

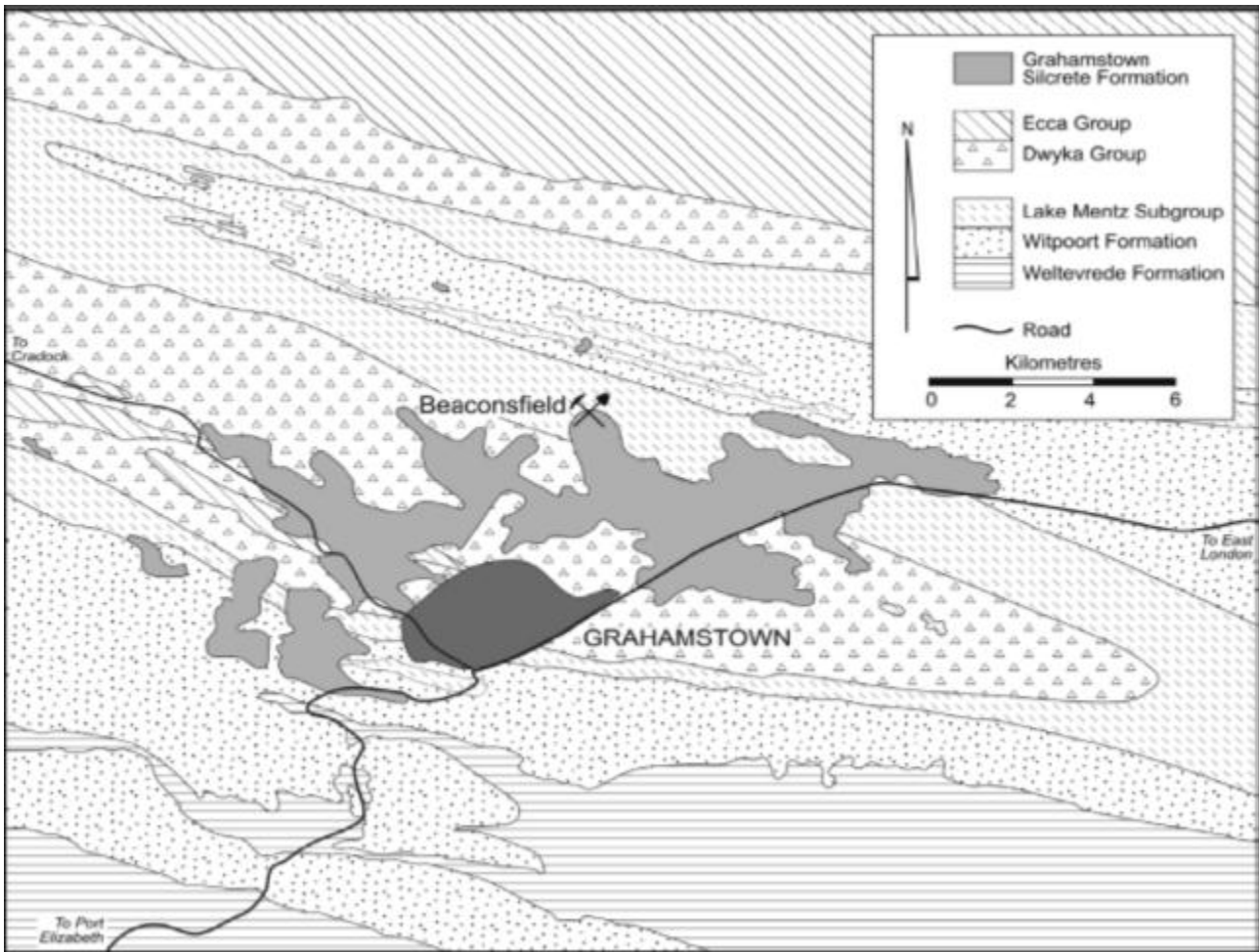


Figure 3-1: Simplified geological map of the area around Grahamstown

Adapted from 1:250 000 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 km². However, only a remnant, about 34 km², 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 understory 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 KeiRiver basin’ (Victor and Dold, 2003)

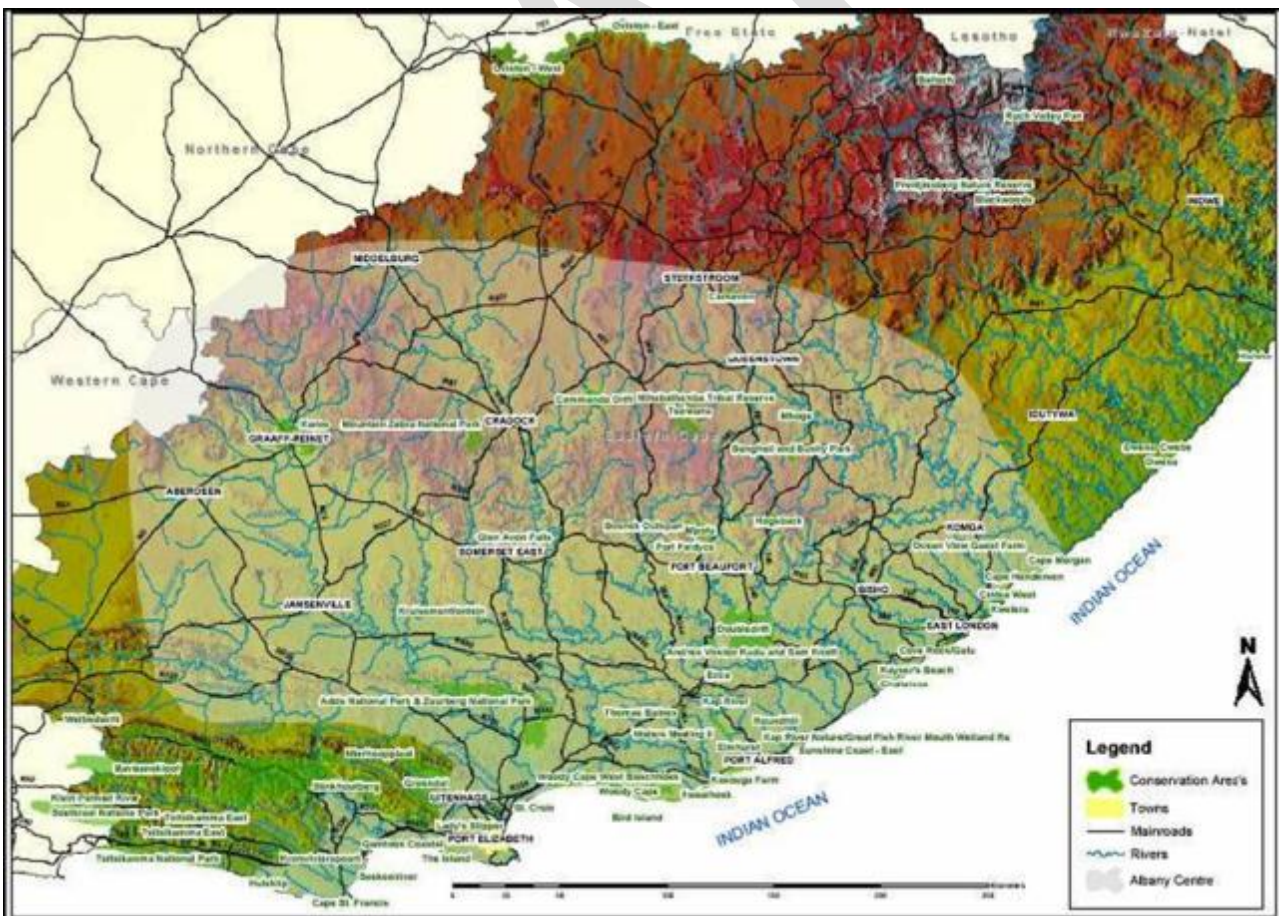


Figure 3-2: The Albany Centre of Endemism, also known as the ‘Albany Hotspot’, has long been recognised as an important centre of plant species diversity and endemism (From van Wyk and Smith 2001).

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 BishoThornveld (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, Secamore, 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).

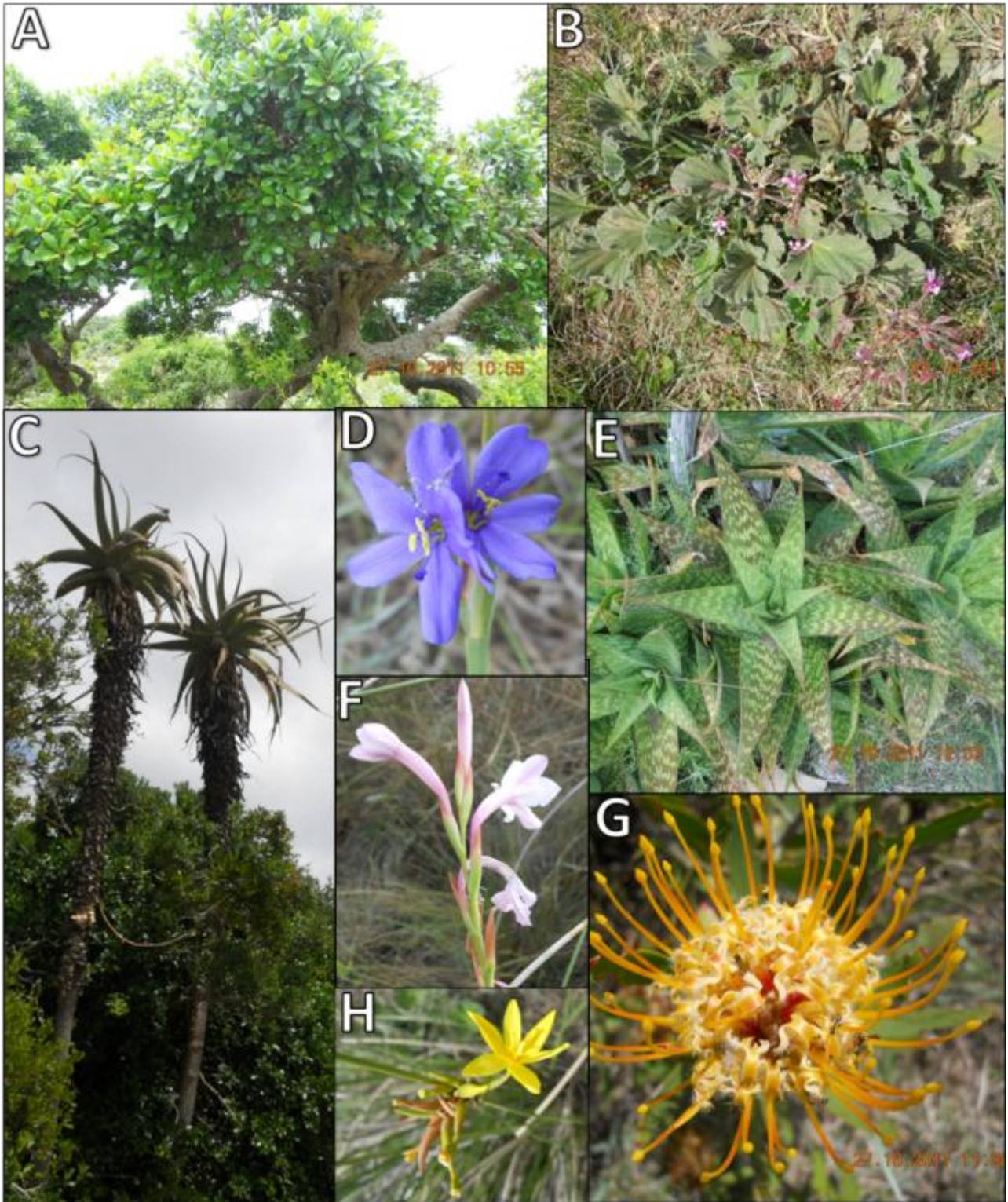


Plate 3.2: Confirmed Species of Special Concern (CSSC).

A: *Sideroxyloninerve* (Forest Act), B: *Pelargonium reniforme* (IUCN), C: *Aloe africana* (PNCO, CITES), D: *Aristeaabyssinica* (PNCO), E: *Aloe maculata* (PNCO, CITES), F: *Watsonia* sp (PNCO), G: *Leucospermum* sp (PNCO) and H: *Bobariaorientalis* (PNCO).



Plate 3.3: Some alien invasive species

A: *Echinopsis spachiana* (Schedule 1), B: *Eucalyptus grandis* (Schedule 2), C: *Agave americana* (Schedule 2), D: *Opuntia ficus-indica* (Schedule 1) and E: *Acacia mearnsii* (Schedule 2).

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 a 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).

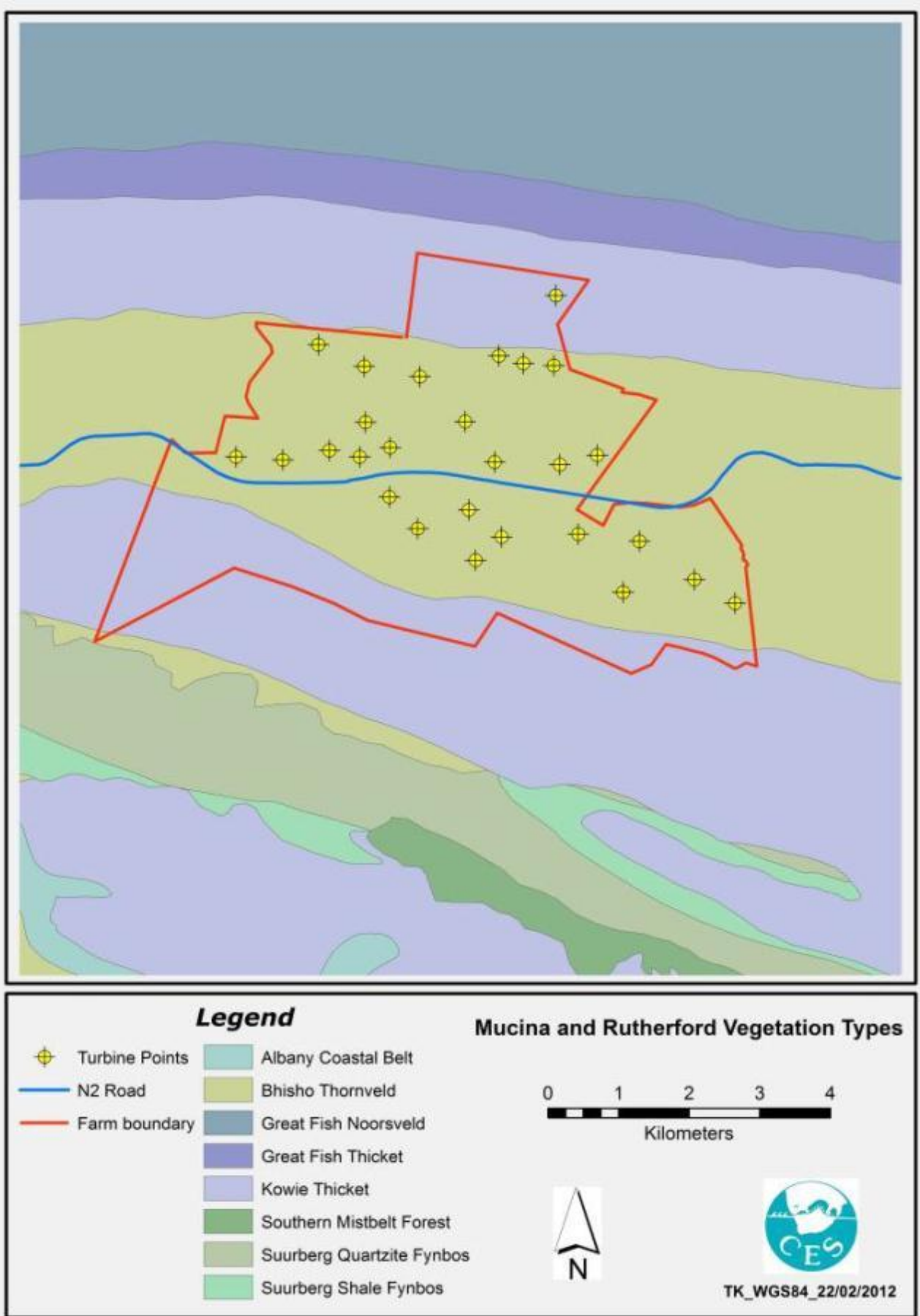


Figure 3.3: Mucina and Rutherford vegetation map of the study area.

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

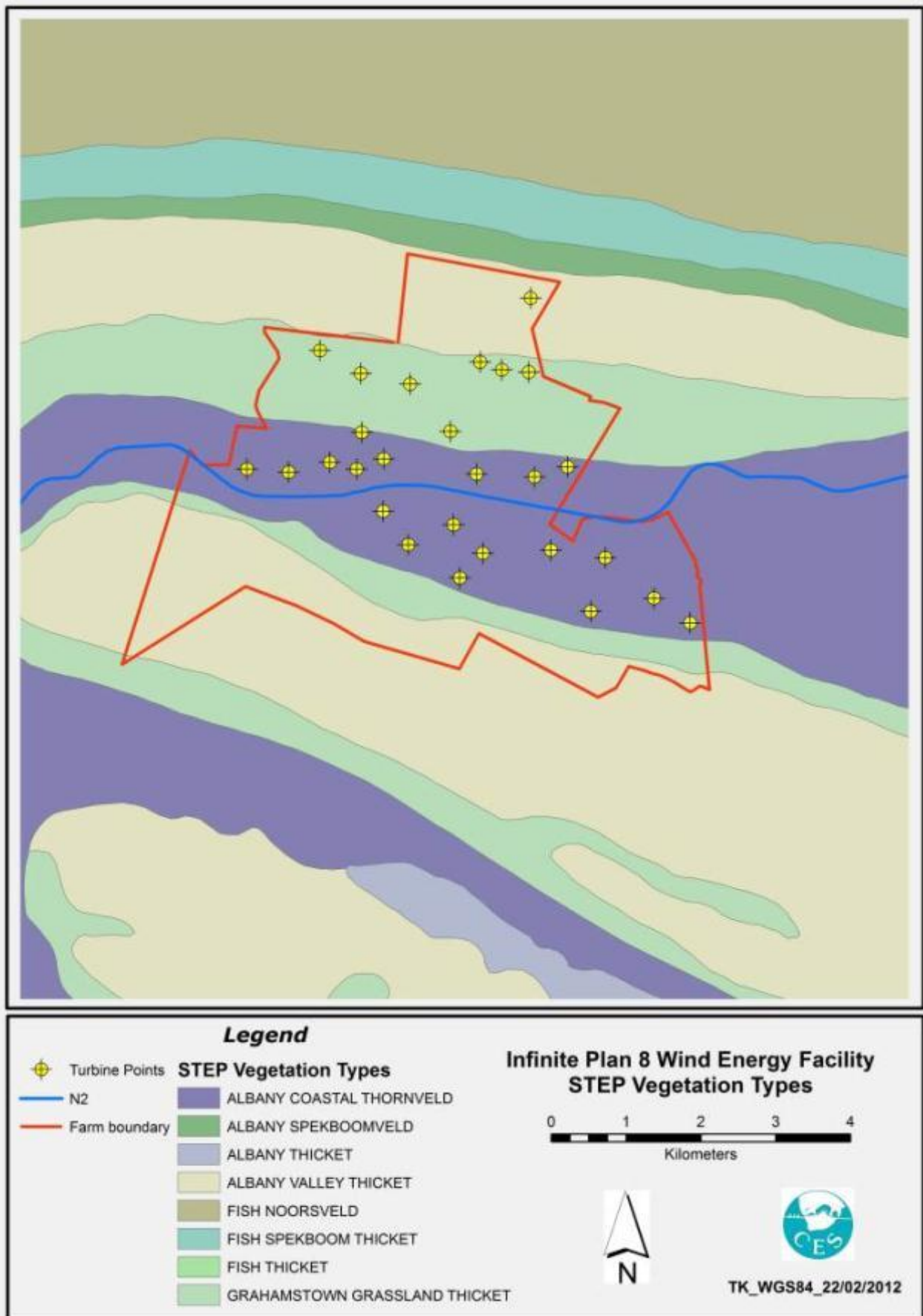


Figure 3-4: STEP vegetation map of the study area.

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 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.

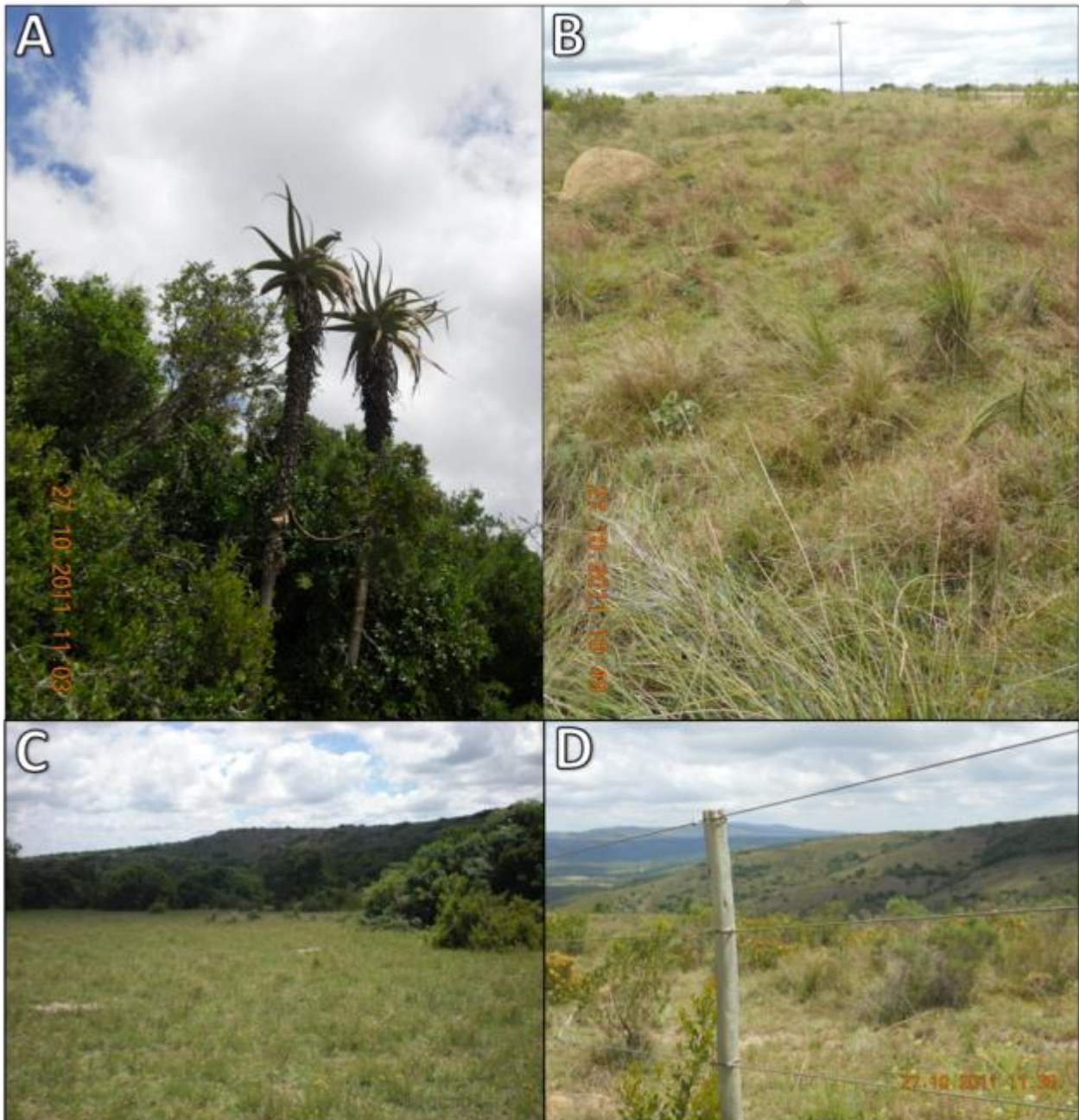


Plate 3.4: Vegetation types from the study area

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 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 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) species, 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.

CBA map category	Code	BLMC	
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

BLMC	Recommended land use objective
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.

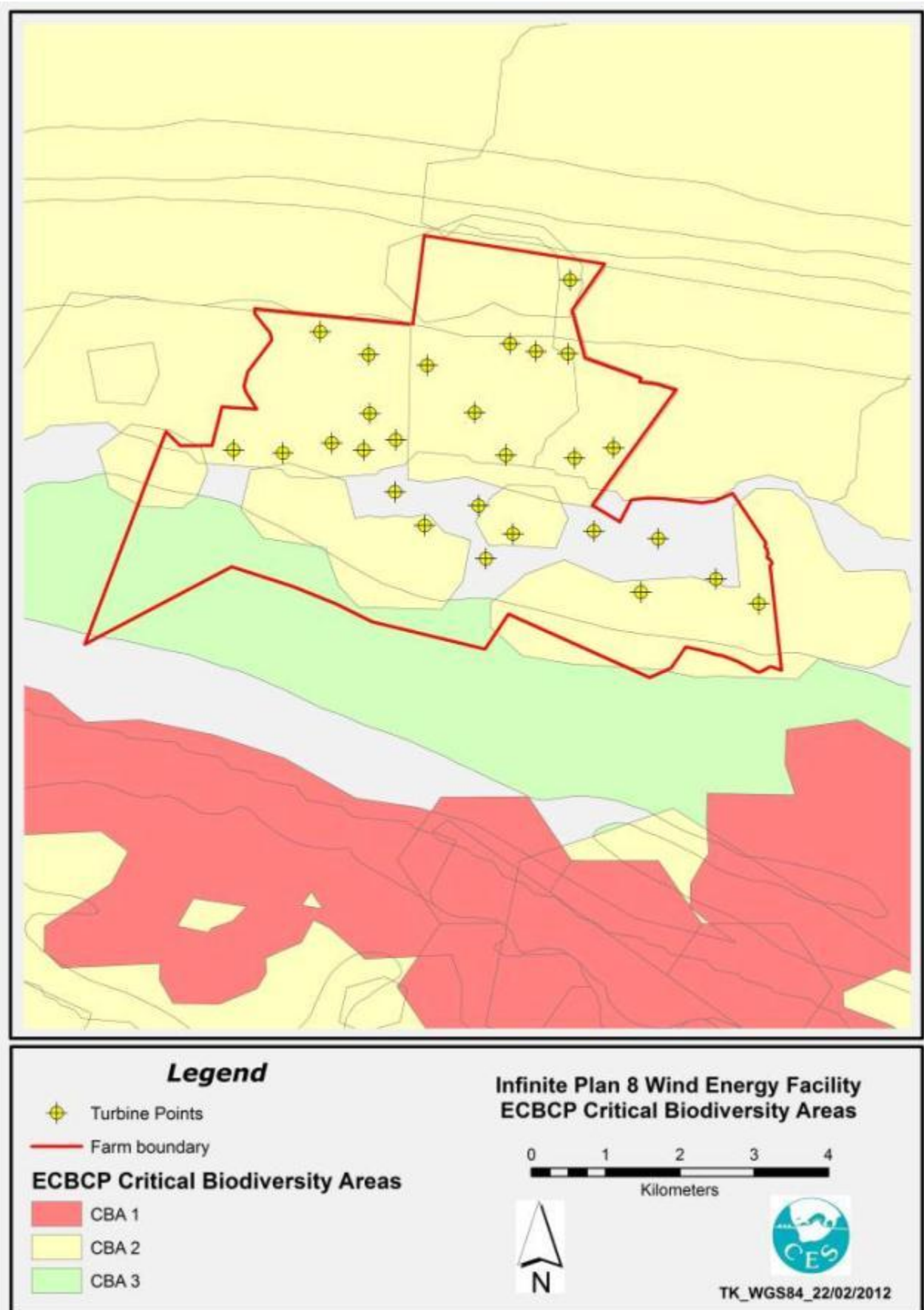


Figure 3-5: CBAs occurring in and around the proposed project area.

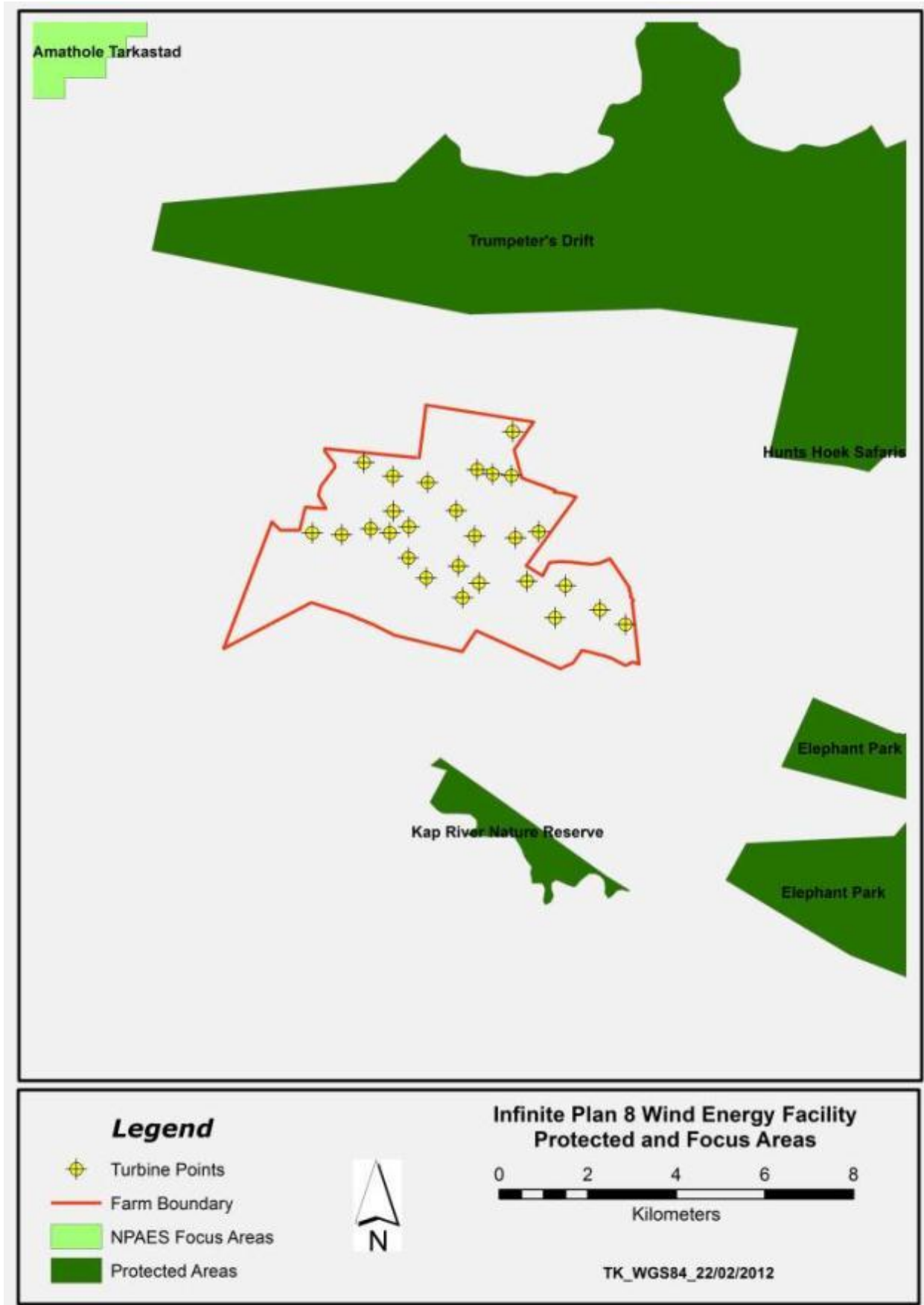


Figure 3-6: Map of the study area in relation to corridors and protected areas as described by the MBCP

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 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 Plan8 Grahamstown Wind Energy Project is to be developed in an area predominantly located in the Makana Local Municipality (MLM) while a small south western section (without any turbines) is located in Ndlame Local Municipality (NLM). 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 both municipal areas.

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 km² 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)¹, 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, Riebeek 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, Riebeek East has traditionally been an agrarian economy, which is still reflected in the current status quo.

A small section of the project is proposed on land portions that fall within the jurisdiction of the NLM. 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 km², 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,

¹StatsSA. 2007. Community Survey 2007: Basic Results for the Eastern Cape. Pretoria: Statistics South Africa.

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.

Table3.4 : 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
TOTAL	100 (%)	100 (%)

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.

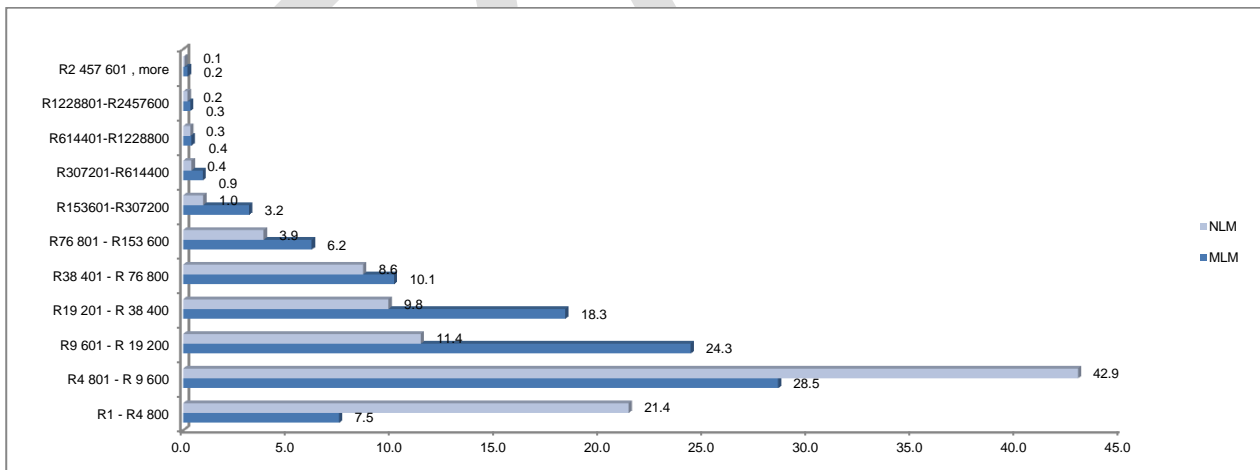


Figure3.8 : Households Income Levels of the NLM and MLM

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
TOTAL	100 (%)	100 (%)

4 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 Plan8 Grahamstown Wind Energy Project. Please note that this has been largely based on information provided by the project proponent. According to Plan8 (Pty) Ltd the motivation for the proposed project in general terms arose from the following potential benefits:

- **Electricity supply**
The establishment of the proposed Plan8 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. Plan8 (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.
- **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 Municipality (MM) to engage with new technologies and industries.

5 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 or reasonable in this case, and will not be considered further in the EIA.

A different location

By virtue of the fact that Plan8 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.

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 Plan8 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 Draft 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.

Prior to the commencement of construction activity, should the project be authorised, Plan8 (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 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 Draft EIR.

6 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.

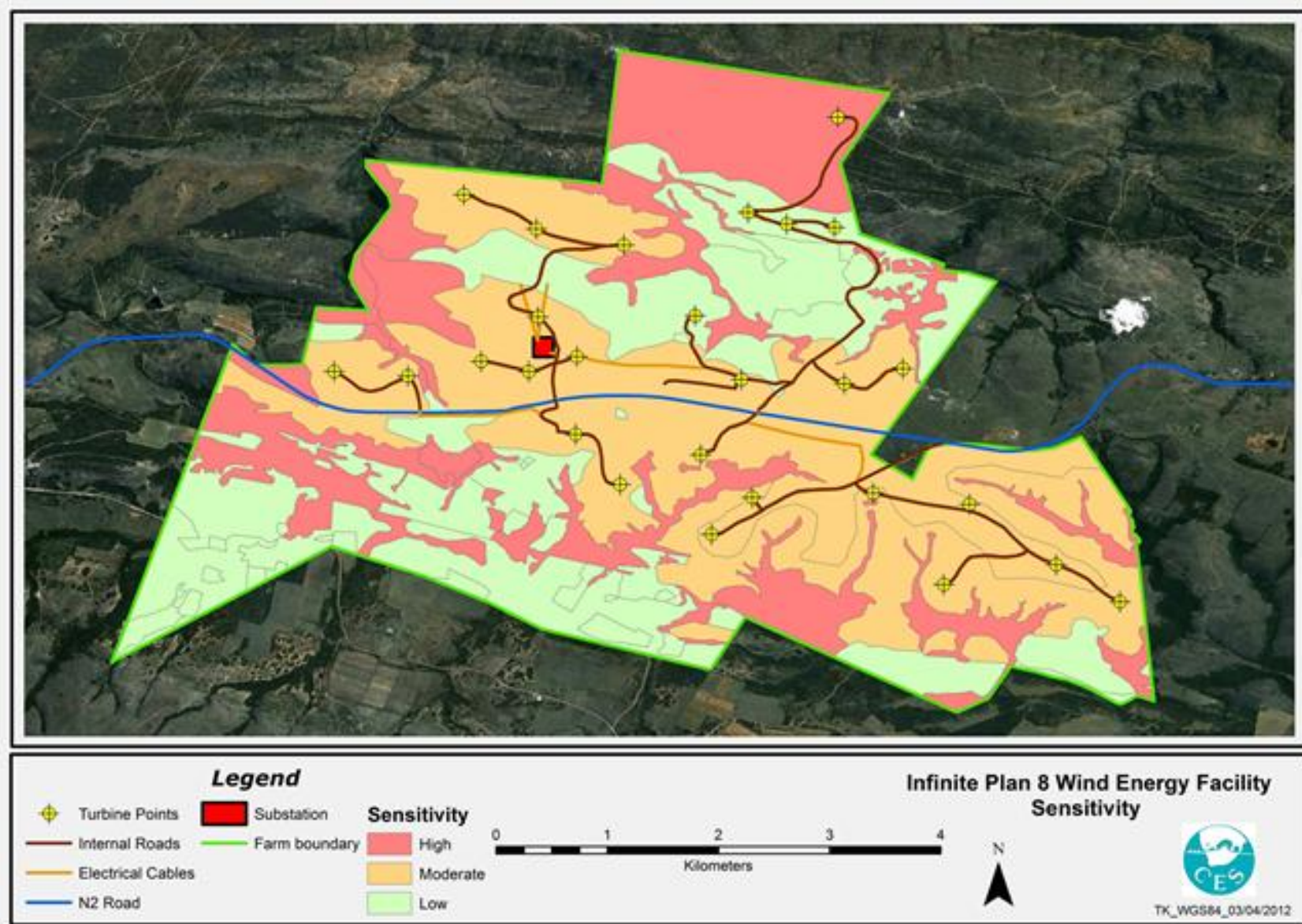


Figure 8-1: Map of the proposed wind energy facility showing the varying sensitivity of the site

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 y 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.

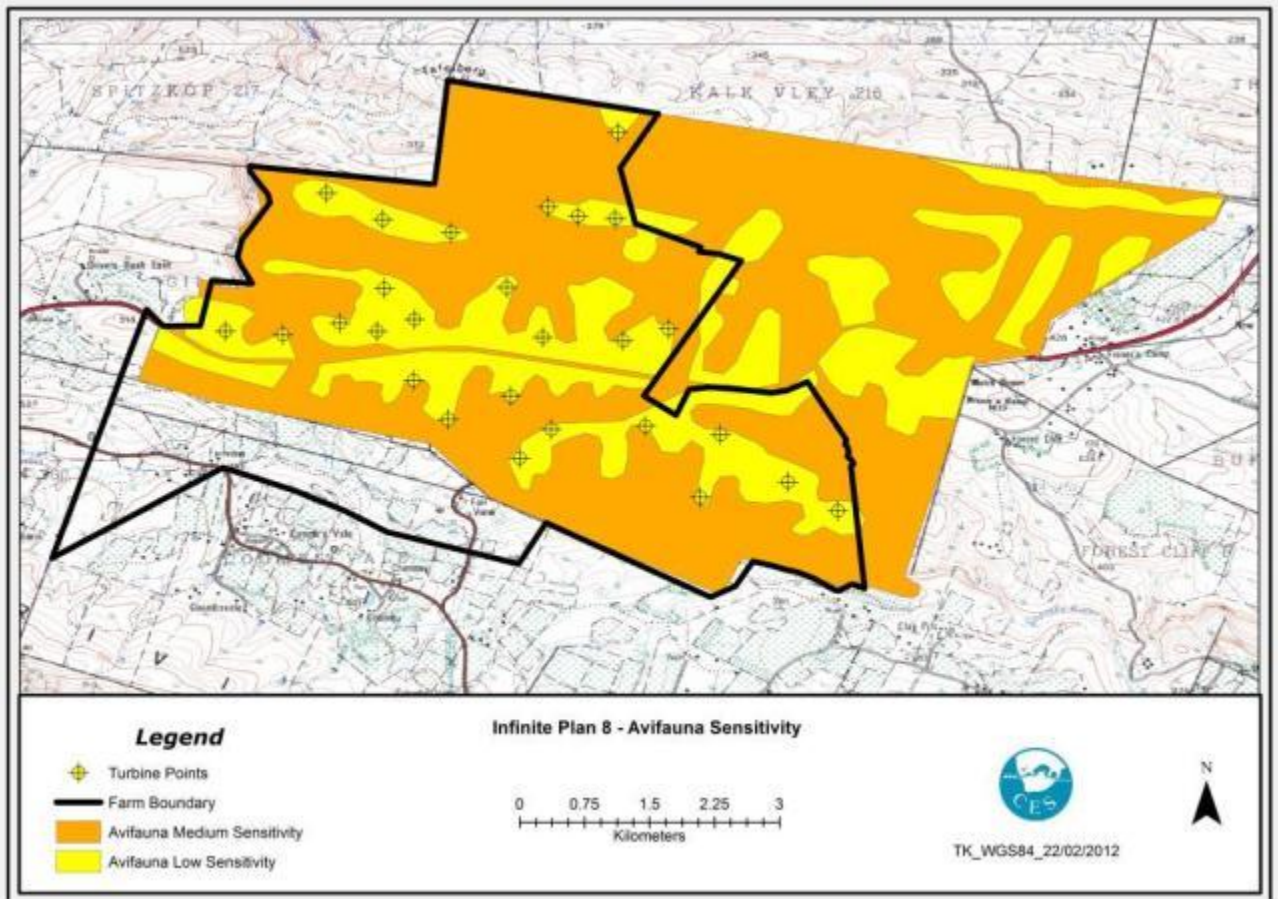


Figure 8-2: Avifaunal sensitivity map for the proposed project.

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 50 metre 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.

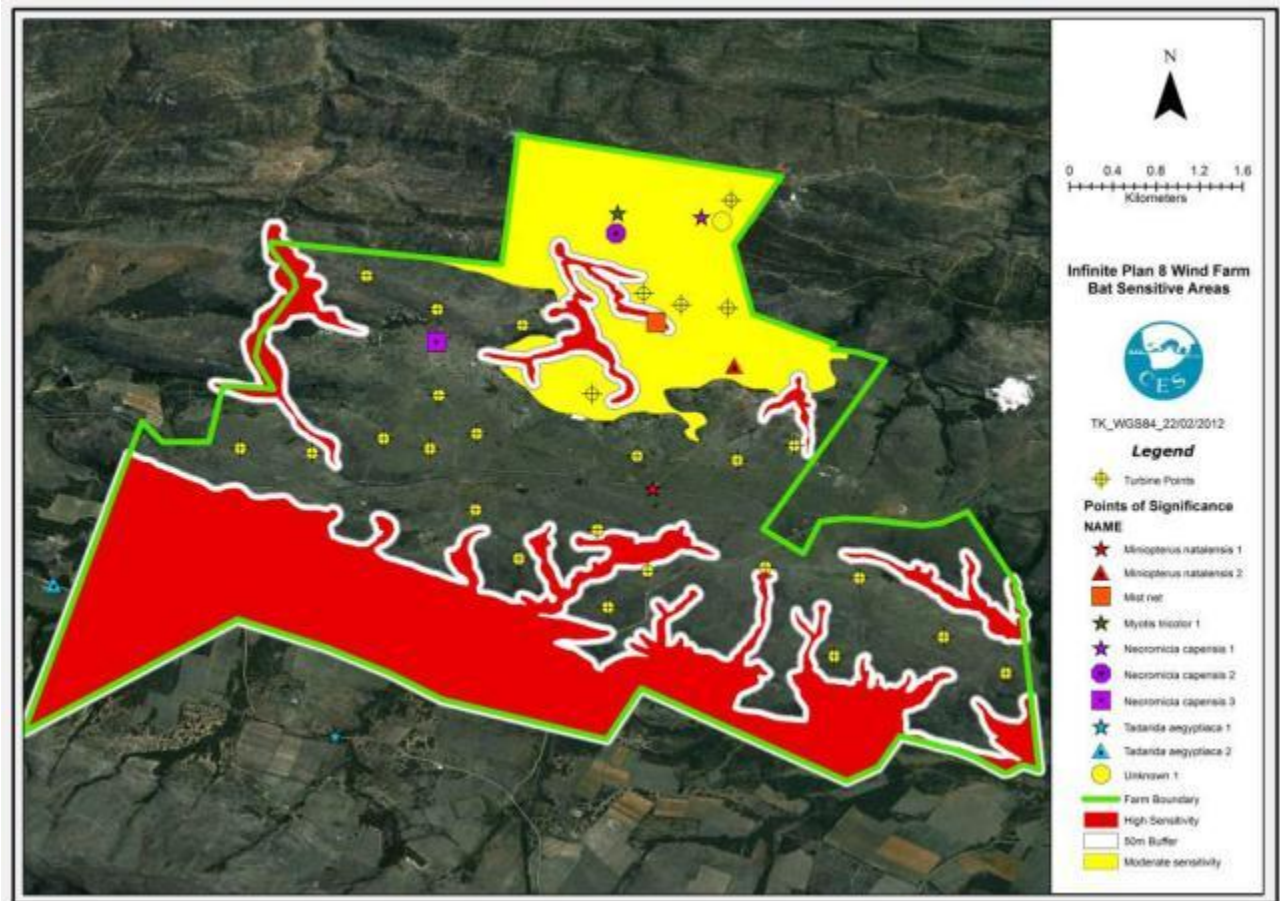


Figure 8-3: Bat sensitivity map

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.

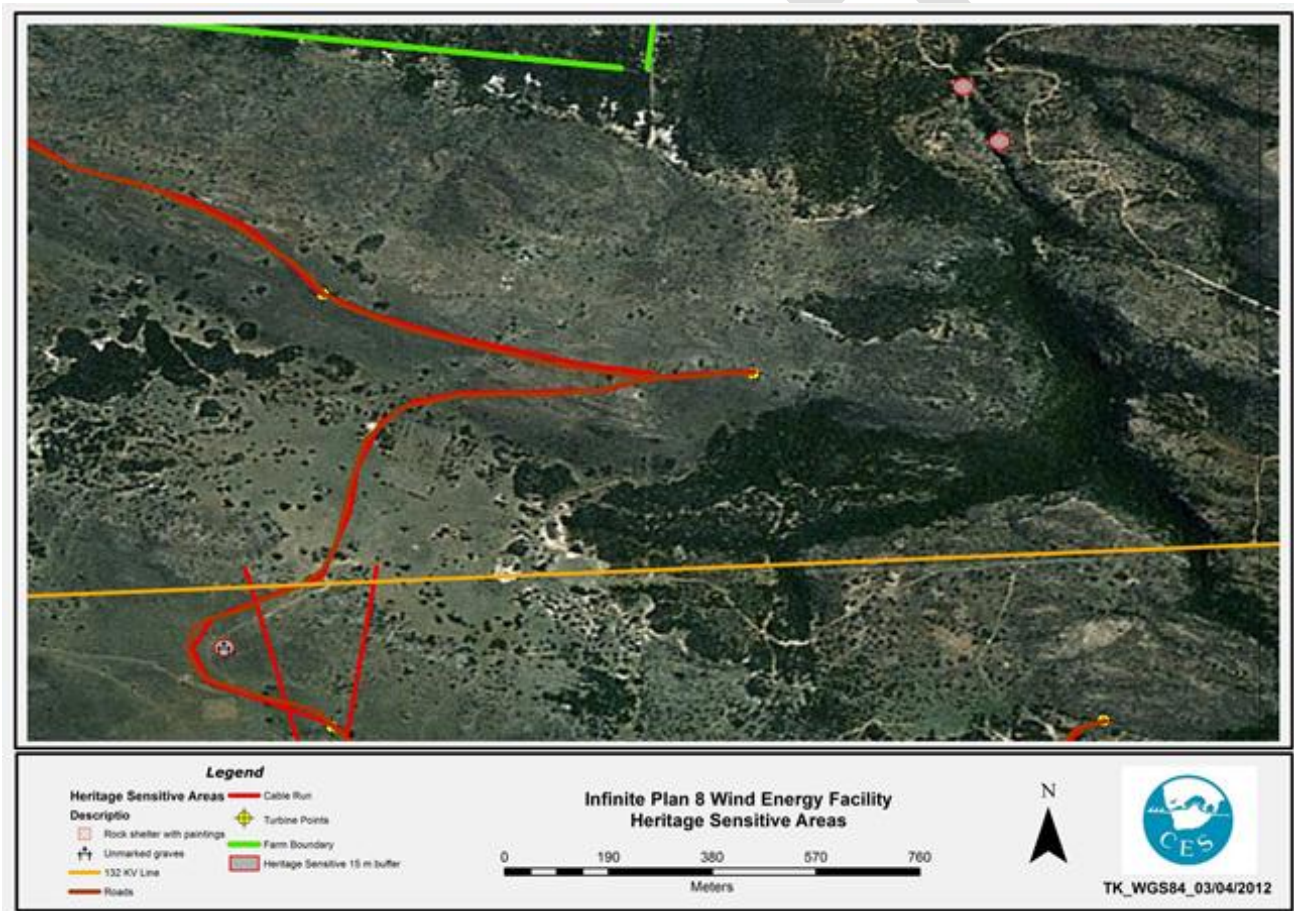


Figure 8-4: Heritage sensitivity map, indicating the location of the identified heritage sites, with 15m buffer zone.

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 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 8-5 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.

Due to the proximity of the wind farm to urban areas it is also clear that there are many visual receptors which will potentially be affected.

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.

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 more than 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 views 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.

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.

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

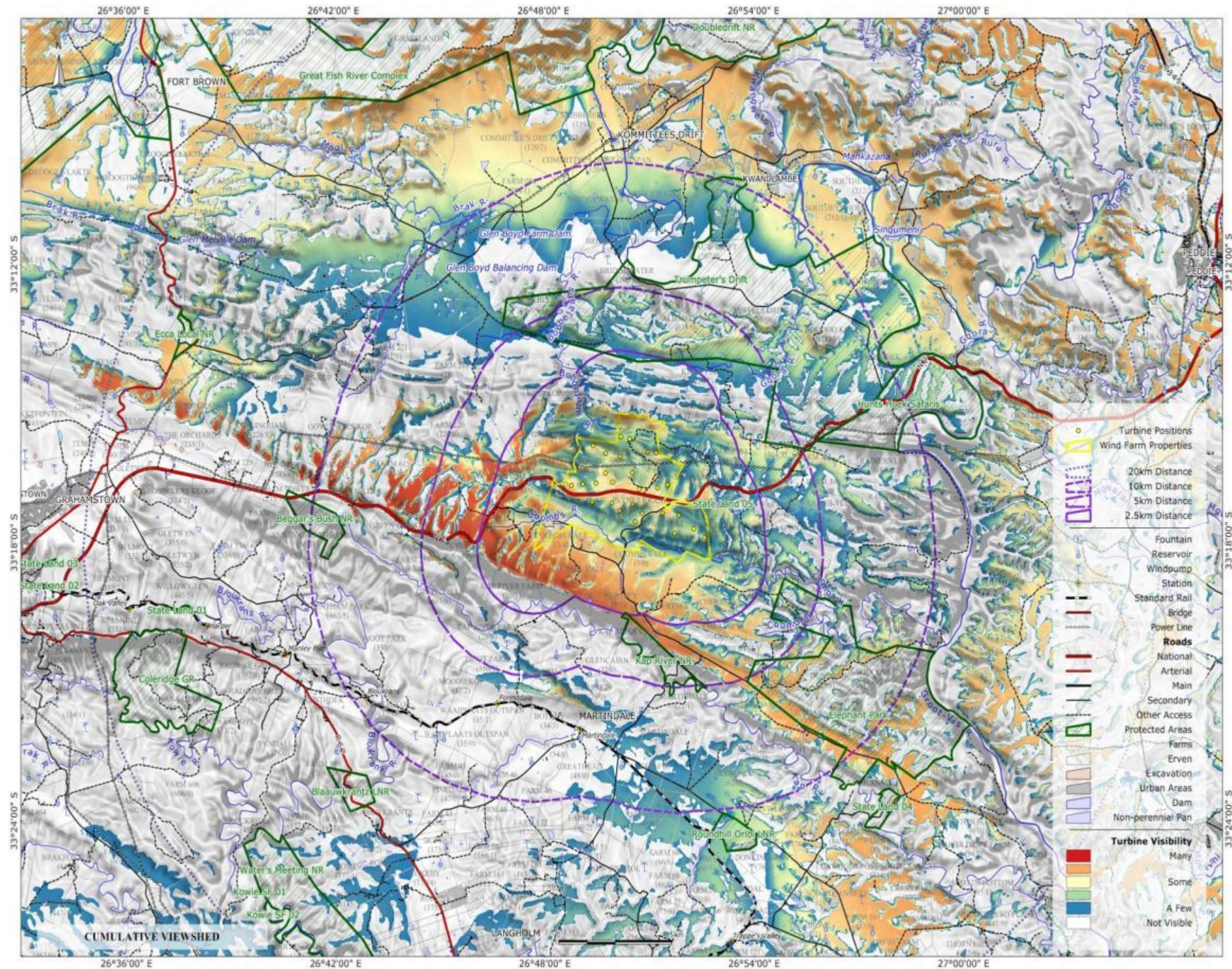


Figure 8-5: Map showing the cumulative viewshed for the wind farm

. 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. Blades 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.

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 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 8.1 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

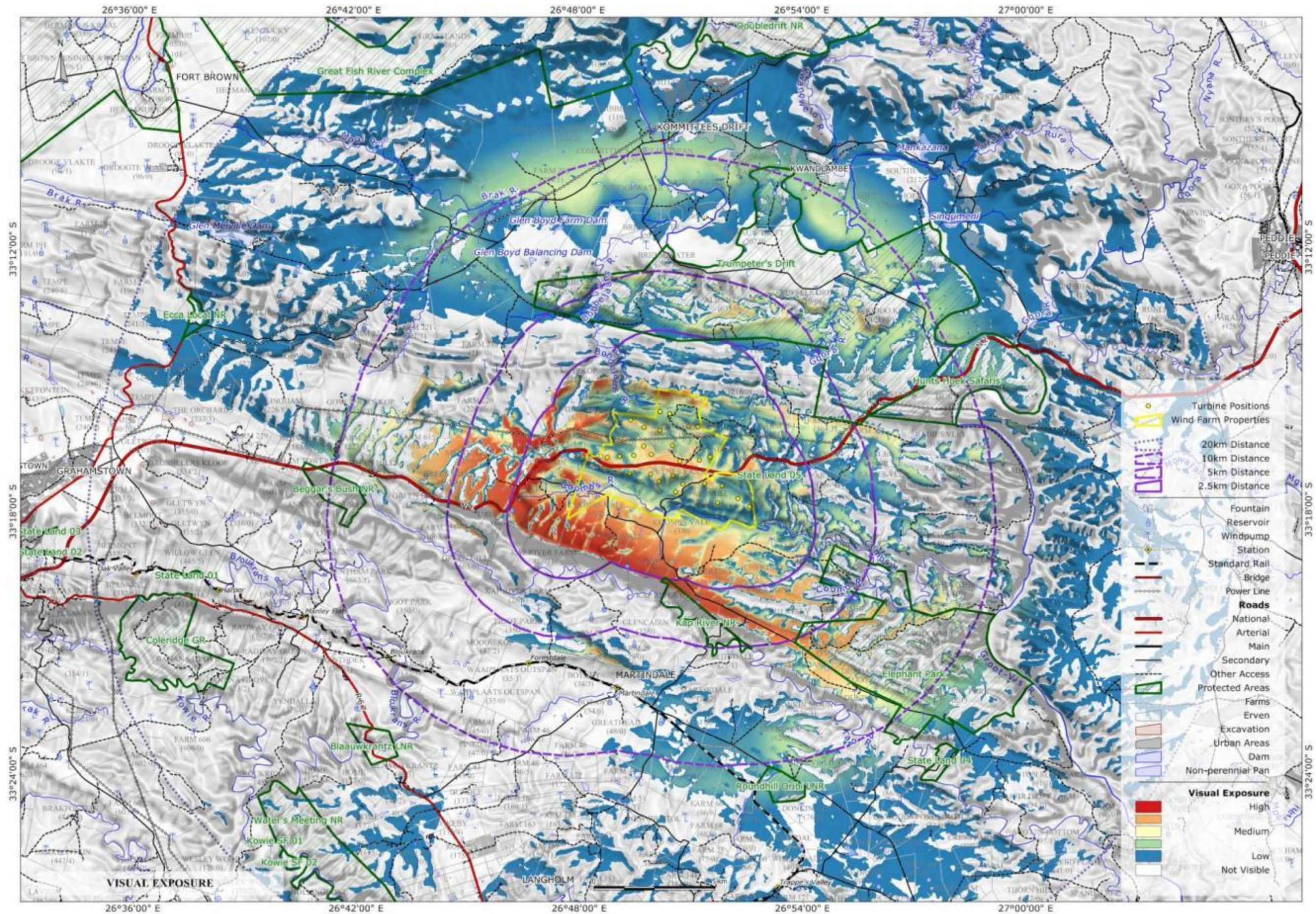


Figure 8-6: Visual exposure calculated from visibility and distance from nearest turbine.

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.

6.6.2 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 8-1 for sites shown in Figure 8-6. 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 8.1: Buildings with potential risk of being affected by shadow flicker

Farm	Label	Hours/Year (H:M:S/A)	Days/Year	Max Hours/Day (H:M/A)	Feature	Longitude	Latitude
Peynes Kraal (362/0)	A	379:45:00	266	02:10	Dam/Quarry	26.8598	-33.2808
Peynes Kraal (362/0)	B	308:32:00	253	01:51	Dam/Quarry	26.8602	-33.2809
Peynes Kraal Outspan (365/0)	C	248:32:00	204	01:43	Dam/Quarry	26.8603	-33.2812
Gilead (361/0)	D	13:05	53	00:21	Derelict House	26.8212	-33.2882

Farm	Label	Hours/Year (H:M:S/A)	Days/ Year	Max Hours/Day (H:M/A)	Feature	Longitude	Latitude
Peynes Kraal (362/0)	E	03:59	25	00:13	House	26.8532	-33.2769
Peynes Kraal (362/0)	F	72:09:00	189	00:44	Communications Tower	26.8401	-33.2801
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
Farm 596 (596/0)	M	48:03:00	122	00:34	Clearing	26.8604	-33.2664
Coombs Vale (3/1)	N	23:15	81	00:25	Dam/ Quarry	26.8347	-33.2982
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

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 8-2 below.

Table 8-2: 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 8-3 and Table 8-4. 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 8-3: 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 8-4: 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 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 for this is ignored for this purpose. Therefore, the distance calculated below would be representative of maximum distances to reach ambient noise levels.

Table 8-5 below gives an illustration of attenuation by distance for a noise of 117dB (sound power) at the source.

Table 8-5: 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

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 8.6 and 8.7) indicate the following for the turbines most likely to be utilised for the project – the Nordex N100 and N90 models respectively:

Table 8-6: 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
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 8-7: 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 windspeed) as well as both workers houses (8-12m/s windspeed).
- 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. 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.

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. 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, as 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.

7 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 included in Chapter 8 where relevant or appropriate before presenting the key findings of each of the specialist studies. Those included in this Chapter have therefore been limited to those relating to the identification and/or assessment of impacts.

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, with mitigation 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		
Construction phase					
Without mitigation	Permanent	Localised	Slight	May occur	LOW -
With mitigation	Permanent	Localised	Slight	Slight	LOW -
No-Go					
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 is remains an overall significance of low negative.

Significance statement

Impact	Effect			Risk or Likelihood	Total Score
	Temporal Scale	Spatial Scale	Severity of Impact		
Construction phase					
Without mitigation	Permanent	Localised	Slight	May occur	LOW -
With mitigation	Permanent	Localised	Slight	Slight	LOW -
No-Go					
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 existed 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		
Construction phase					
Without mitigation	Permanent	Localised	Slight	May occur	LOW -
With mitigation	Permanent	Localised	Slight	Slight	LOW -
No-Go					
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 is remains an overall significance of low negative.

Significance statement

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

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		
Construction phase					
Without mitigation	Long term	Study area	Slight	Unlikely	LOW -
With mitigation	Short term	Study area	Slight	Unlikely	LOW -
No-Go					
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		
Construction phase					
Without mitigation	Short term	Study area	Severe	Definite	MODERATE -
With mitigation	Short term	Study area	Moderately beneficial	Definite	MODERATE +
No-Go					
Without mitigation	Permanent	Study area	Moderate	Definite	HIGH -
With mitigation	N/A	N/A	N/A	N/A	N/A

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				
Construction phase									
Without mitigation	Permanent	4	Localised	1	Slight	1	Definite	4	LOW- TO MODERATE -
With mitigation	Permanent	4	Localised	1	Slight	1	Definite	4	LOW -
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

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 and photovoltaic 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							
Construction phase										
Without mitigation	Short term	1	Localised	1	Slight	1	Probable	3	6	LOW -
With mitigation	Short term	1	Localised	1	Slight	1	Probable	3	6	LOW -
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

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 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 foraging habitat. Such areas are higher in moisture and will therefore support more insects, which in turn will attract more insectivorous bats.

Mitigation and Management

Correct turbine placement is empirical 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 be

avoided.

Significance Statement

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale	Severity of Impact							
Construction phase										
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 -
No-Go										
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.

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 be avoided.

Significance Statement

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale	Severity of Impact							
Construction phase										
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 -
No-Go										
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						
Construction phase										
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 -
No-Go										
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 9.1 – 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 9.2 - Typical Construction Noise

Type of Equipment	L _{Req,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 Tables 9.1 and 9.2. 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 9.3 - 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

Description	Typical Sound Power Level (dB)
Piling machine (mobile)	115
Total*	117

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

Table 9.4 - 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 9.5– 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.

Significance Statement – Construction Activities

Impact	Effect						Risk or Likelihood	Total Score	Overall Significance	
	Temporal Scale	Spatial Scale	Severity of Impact							
Construction phase										
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 -
No-Go										
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 9-1: 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						
Construction phase										
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 -
No-Go										
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							
Construction phase										
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 -
No-Go										
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							
Construction phase										
Without mitigation	Long Term	3	Localised	1	Moderate to Slight	2 to 1	Unlikely or probable	1 or 3	7 or 10	LOW TO MODERATE
With mitigation	Long Term	3	Localised	1	Moderate to Slight	2 to 1	Unlikely or probable	1 or 3	7 or 10	LOW TO MODERATE
No-Go										
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 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						
Construction phase										
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 -
No-Go										
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

Impact20: 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. 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						
Construction phase										
Without mitigation	Permanent	4	Study area	2	Severe	4	Definite	4	14	HIGH -
With mitigation	Medium term	2	Study area	2	Moderate	2	May occur	2	8	MODERATE -
No-Go										
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

Impact21: 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.

Significance Statement

Impact	Effect						Risk or Likelihood	Total Score	Overall Significance	
	Temporal Scale	Spatial Scale		Severity of Impact						
Construction phase										
Without mitigation	Permanent	4	Study area	2	Very severe	8	Definite	4	18	VERY HIGH -
With mitigation	Medium term	2	Study area	2	Moderate	2	May occur	2	8	MODERATE -
No-Go										
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

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 operation phase. Removal of existed 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.

Significance statement

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale	Severity of Impact							
Operation phase										
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 +
No-Go										
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: Collision of birds with turbines

Cause and Comment

The theory behind birds colliding with the turbines has been explained elsewhere in this report. 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 and Management

The following is a suite of mitigation measures that are recommended in order to mitigate this impact to within acceptable levels:

- Firstly, the correct siting of turbines (micro siting) within the study area as discussed in the main report is essential. This should be done by providing on site avifaunal input into the final site specific EMP, and by incorporating the data from the recommended 12 months pre construction monitoring;
- Secondly, a comprehensive pre and post construction monitoring programme for at least 12 months before construction and 12 to 24 months after construction must be conducted, as per the methodology (*Refer to Volume 2: Appendix 1*) and according to the recently compiled guidelines by Jenkins, *et. al.*2011). The results of the pre-construction monitoring must inform the final layout of turbines and other infrastructure;
- Thirdly, if this monitoring reveals significant potential or actual impacts (pre and post construction respectively), suitable mitigation measures will need to be implemented by the wind farm operator, and several options have been detailed in this report.

The sensitivity categories were assigned using the following factors:

High sensitivity: The high sensitivity zones are the dams in the study area. Construction of infrastructure in these areas and a buffer of 500m around them is not recommended.

Medium Sensitivity: The medium sensitivity zones are the areas where wetlands and drainage lines occur, and a buffer of 200m around them. These will be natural flight paths and attractive habitat for various species.

Low Sensitivity: These are the remaining areas outside of the medium and high sensitivity zones. Construction of infrastructure is preferred in these areas

It is essential that avifaunal input is provided once all project information has been finalised, most importantly exact turbine positions. This avifaunal input could be in the form of a site specific avifaunal EMP or input into the overall EMP. Additional mitigation for collisions if necessary post construction could include: painting or marking two of the three turbine blades as specified in this report above, to reduce the chances of retina blur and thus mitigate for collision; curtailment of turbines during high risk periods; adjustment of blade heights on turbines. Lighting may also become an issue for avifauna and as such, the turbines should remain unlit as far as possible. Should it be necessary for lights to be placed on turbines, these must only be red strobe lights. Since wind energy in South Africa is so new, it is difficult to rate the impacts of collisions based just on international experience. As such, we have been very cautious when compiling this report. A detailed pre and post construction monitoring program is essential on this facility in order to reduce the uncertainty contained in this assessment study.

Significance Statement

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale		Severity of Impact						
Operation phase										
Without mitigation	Long term	3	Study Area	2	Severe	4	Probable	3	12	HIGH -
With mitigation	Long term	3	Study Area	2	Moderate	2	Probable	3	10	MODERATE-
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

The impact of collisions is a high negative impact and must be mitigated to reduce the impact. The severity of impact has been rated as severe since it is possible that Red Listed species may be killed. The site specific EMP will, to a large extent, tighten up and further define the mitigation measures required in order to do this. We are not certain of how effective or practical the various mitigation options proposed above are, and so the impact has remained at medium negative after mitigation. With the No-Go alternative there will be zero chance of collision with turbines since they will not be constructed and hence is not applicable. This is the impact for which we have the lowest confidence, as the scope of this study did not allow for the collection of bird movement data (flight frequency, height, etc) in order to assess the likelihood of collisions. The recently compiled guidelines on monitoring and impact mitigation at wind farms (Jenkins, van Rooyen, Smallie, Anderson & Smit, 2011) call for at least 12 months of this data collection prior to the compilation of reports such as this current one. Since this has not been possible on this project, we would recommend that this data collection be initiated as soon as possible, and that the results be used to inform the final layout of the infrastructure.

Impact 3: Disturbance of avifauna during operation

Cause and Comment

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

Mitigation and Management

No mitigation is required, as it is unlikely that any measures that are feasible will reduce the impact of this disturbance to an extent where the shy and sensitive species will remain. In comparison to the other impacts, this impact is relatively minor.

Significance Statement

This impact has been rated as moderate negative before mitigation in the table below. If the facility is not constructed there will be no disturbance to avifauna and hence the impact of the No-Go is not applicable.

Impact	Effect						Risk or Likelihood	Total Score	Overall Significance	
	Temporal Scale	Spatial Scale		Severity of Impact						
Operation phase										
Without mitigation	Long term	3	Study Area	2	Slight	1	May Occur	2	8	MODERATE -
With mitigation	N/A		N/A		N/A		N/A			N/A
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: Disruption of local bird movement patterns

Cause and Comment

The proposed wind energy facilities in particular will no doubt be a huge obstacle for birds to avoid, particularly in this landscape where other vertical infrastructure of this scale is relatively absent. The birds' avoidance behaviour may in the case of some species lead to decreased fitness as birds expend more energy flying from one point to another.

Mitigation and Management

This impact is exceptionally difficult to mitigate for and shall be best informed by the results of the monitoring programme.

Significance Statement

The significance of this impact has been rated as medium negative before mitigation. The mitigation for this impact is unknown in its effectiveness and should not be seen as solving the problem as it is uncertain as to whether birds will use corridors between turbines and if they do how much increased risk they will face from collisions.

Impact	Effect						Risk or Likelihood	Total Score	Overall Significance	
	Temporal Scale	Spatial Scale		Severity of Impact						
Operation phase										
Without mitigation	Long term	3	Study Area	2	Slight	1	May Occur	2	8	MODERATE -
With mitigation	N/A		N/A		N/A		N/A			N/A

Impact	Effect			Risk or Likelihood	Total Score	Overall Significance
	Temporal Scale	Spatial Scale	Severity of Impact			
Operation phase						
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 5: Collision and Electrocution of Birds with Power Lines and Substations

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 line 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 and Management

As there will be a very negligible impact due to underground cabling being used no mitigation is necessary. Should this change the Avifaunal Specialist must be informed and given the opportunity to reassess this impact.

Significance Statement

Negligible

7.2.3 Bats (Chiroptera)

Impact 6: 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. These turbines are too close 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. 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						
Operation phase										
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 -
No-Go										
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 7: Bat mortalities during migration by turbine blades, a cumulative impact

Cause and Comment

The migration paths of South African bats in Mpumalanga are virtually unknown. Cave dwelling species like *Miniopterus natalensis* and *Myotis tricolor* undertakes 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 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 bats migration long distances (up to 260 km according to Van der Merwe, 1973) can be detrimental if no mitigations 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						
Operation phase										
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 -
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

7.2.4 Archaeology**Impact 8: 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, whence 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						
Operation phase										
Without mitigation	Permanent	4	Localised	1	Slight	2	May Occur	2	9	MODERATE -
With mitigation	Permanent	4	Localised	1	Slight	1	Unlikely	1	7	LOW -
No-Go										
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

7.2.5 Noise

Impact 9: 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.

Table 9.6 - Predicted noise levels at the NSA's during the operational phase

NSA 1 - Jakkelsdraai Farm House				
Distance to Nearest WTG[m] - min 500m		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

NSA 2 - Honeykop Lodge				
Distance to Nearest WTG[m] - min 500m		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

NSA 3 - Honeykop Farmhouse				
Distance to Nearest WTG[m] - min 500m			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

NSA 4 - Peynes Kraal Farm House				
Distance to Nearest WTG[m] - min 500m			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
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] - min 500m			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] - min 500m			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] - min 500m			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] - min 500m			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] - min 500m		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] - min 500m		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

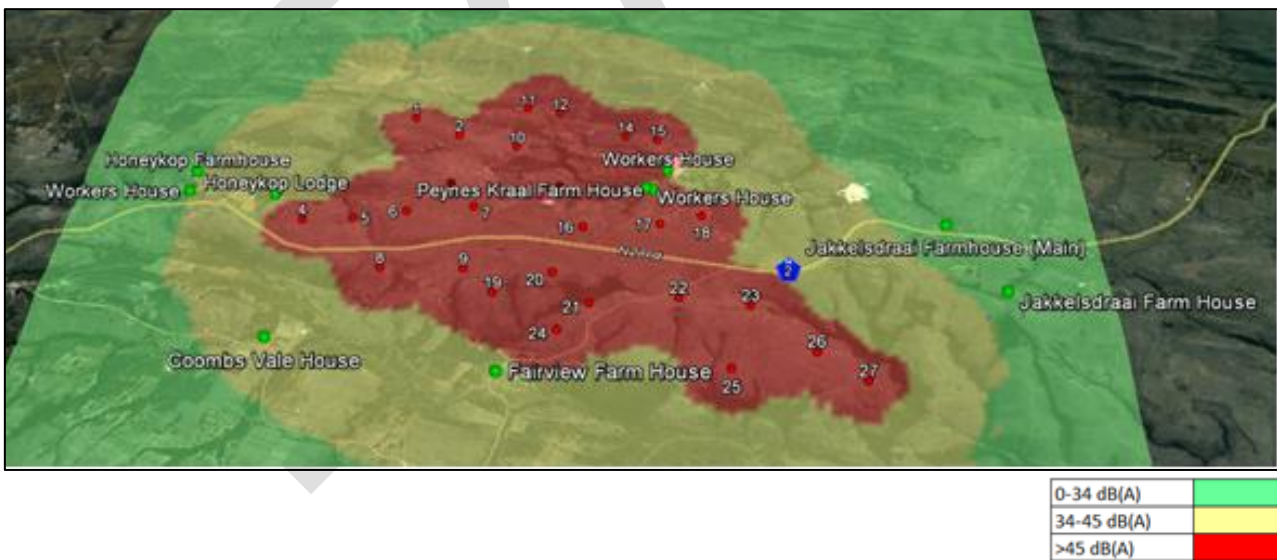


Plate 9-2 – Nordex N100 2.5MW Result 12m.s-1wind speed

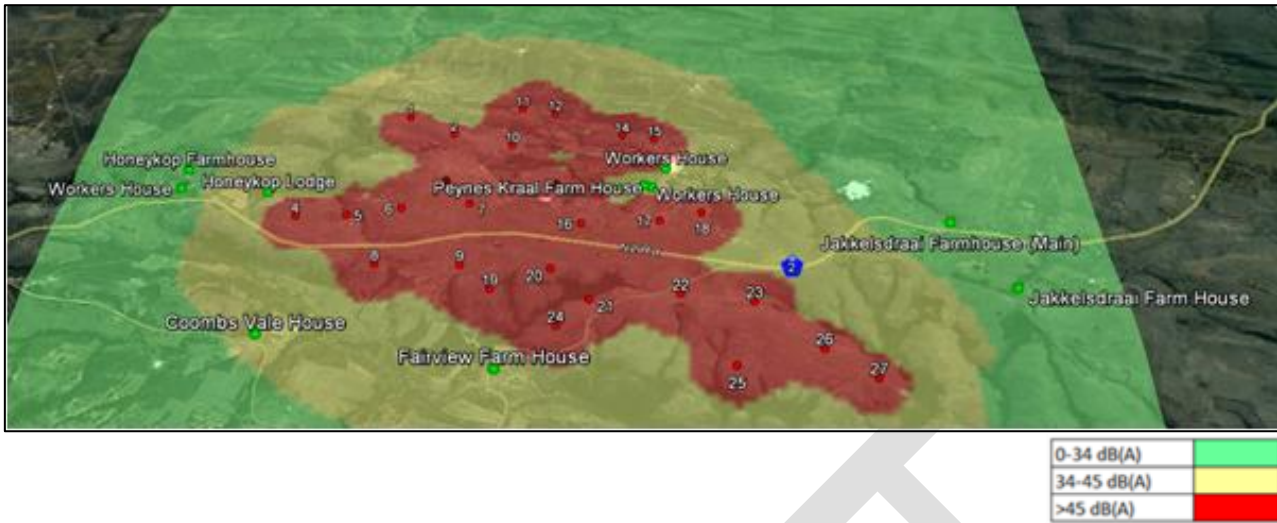


Plate 9-3 – Nordex N90 2.5MW result 12m.s⁻¹ wind speed

Significance Statement

Impact	Effect					Risk or Likelihood	Total Score	Overall Significance		
	Temporal Scale	Spatial Scale	Severity of Impact							
Operation phase										
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 -
No-Go										
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 10: 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							
Operational phase										
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-
No-Go										
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 is 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 11: Impact of shadow flicker on residents in close proximity to wind turbines**Cause and Comment**

The impact of shadow flicker caused by wind turbines appears to be a minor issue in most countries where wind farms are common. There are no official sets of regulations governing levels of exposure to shadow flicker and it is unclear what the health risks are. Most reports on shadow flicker suggest that the threshold for a significant impact is 30 hours per year or more and many countries have adopted this as an informal regulation, following a court judgement made in Germany (EDR 2009). According to the data sets available to the author there are a number of buildings within 500m of wind turbines. It is recommended that a shadow flicker analysis be conducted to identify buildings within the 30h/a zone, and that the relevant turbines be positioned to minimise the number of buildings in that zone.

7.2.7 Agriculture**Impact 12: 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 ²
Foundations	1039.08 m ²
Hard-standings	30375 m ²
Buildings	100 m ²
Total (m ²)	117921.04 m ²

Total (ha) 11.79 ha

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							
Operation phase										
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-
No-Go										
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. It is important to note that the focus of this EIA is the proposed facility rather than the impact of other potential wind farm, or other types of developments, in the study area.

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) 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.

DRAFT

8 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 Draft EIR provides a summary of the findings of the proposed Plan8 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. 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 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 windspeeds of between 6 m.s⁻¹ & 12 m.s⁻¹. Only the main farmstead will be affected by the Nordex N90 turbine at 12 m.s⁻¹ 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 ongoing 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 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 palaeontological 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 palaeontological 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 is 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 below is a compilation of 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.

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

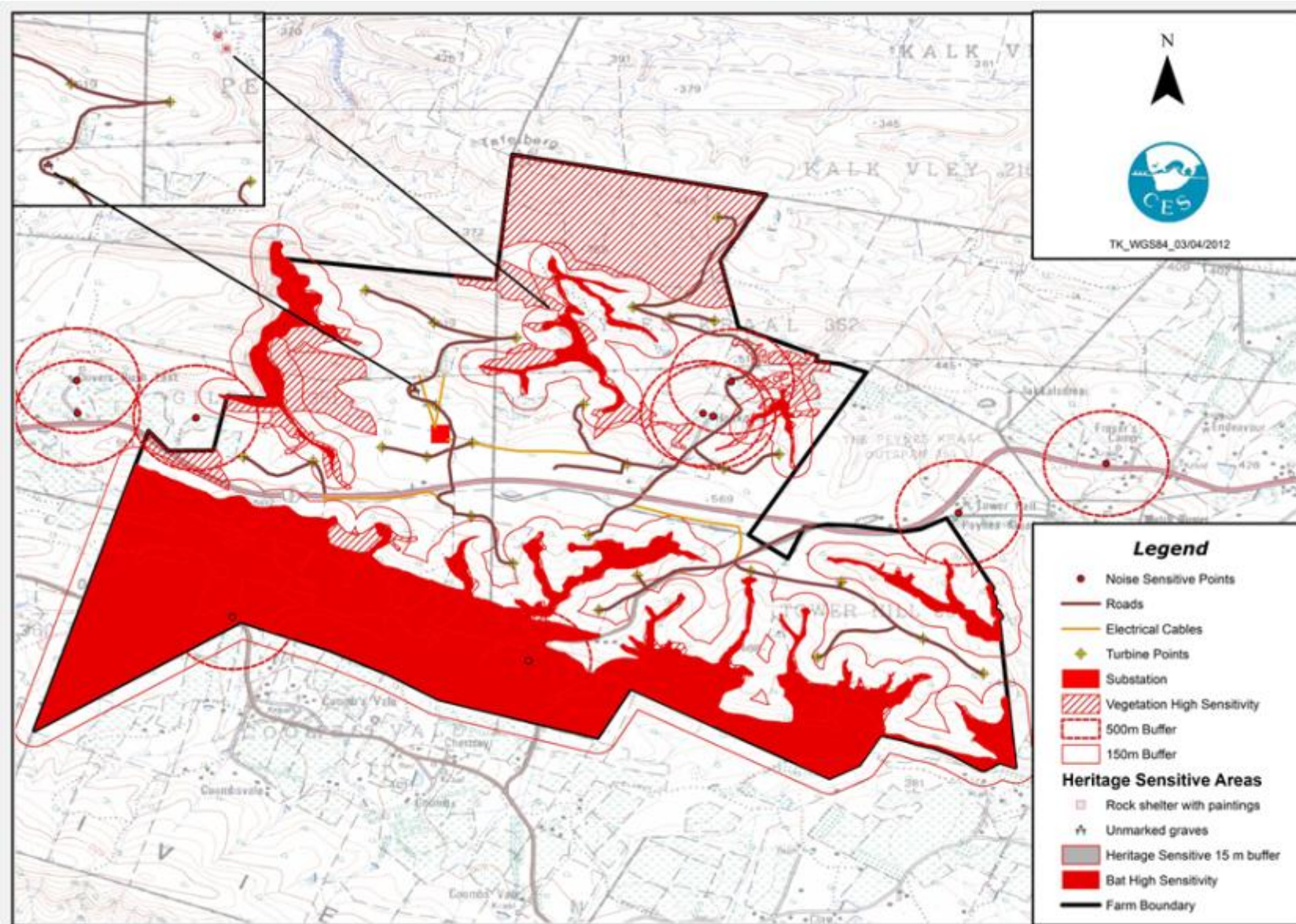


Figure 8-1: Revised turbine layout including existing/proposed access roads and cable layouts as informed by identified sensitivities

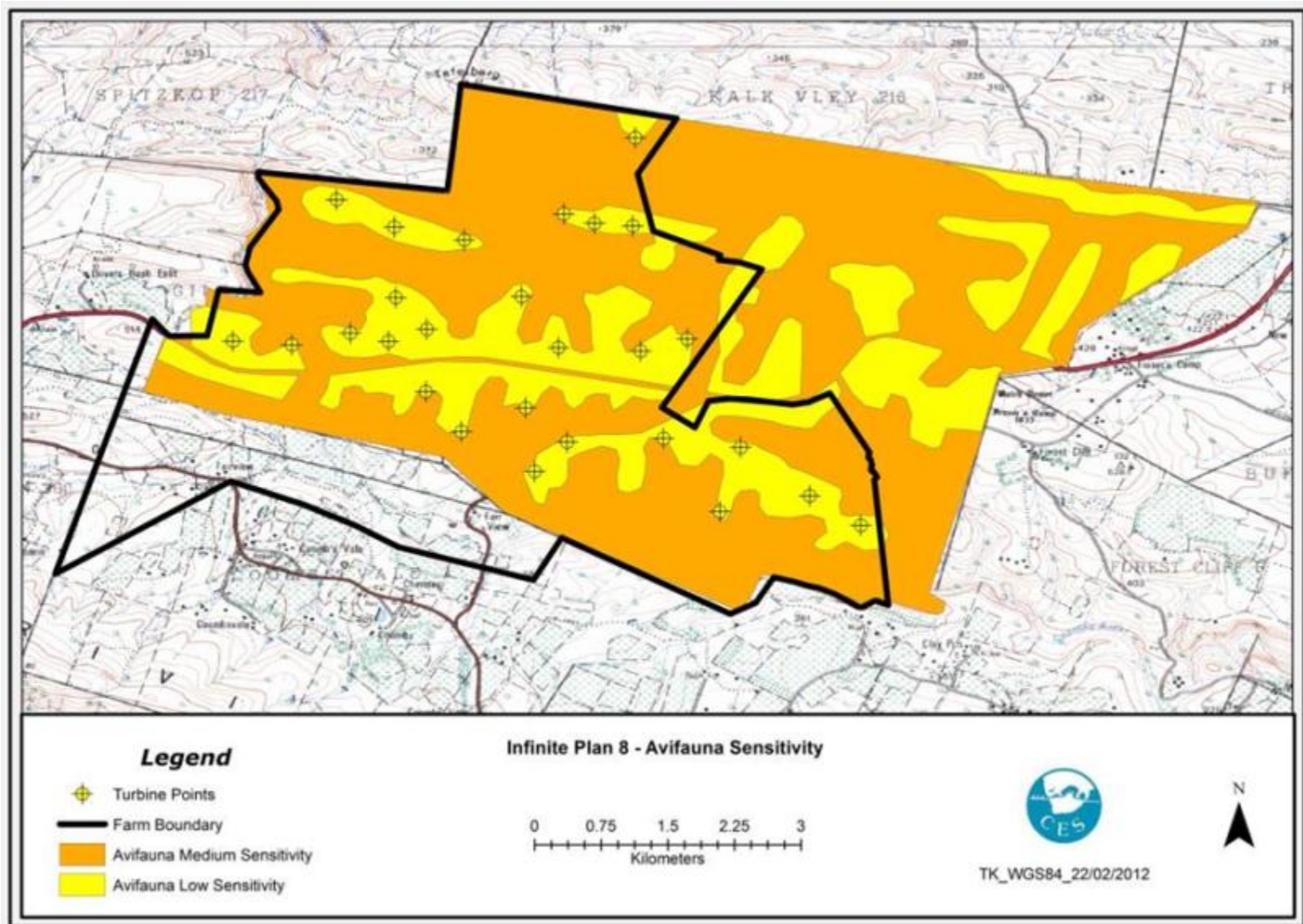


Figure 8-2: Bird Sensitive Areas. It was recommended by the specialist that no turbines be placed in the medium sensitivity areas – shown here in orange.

Table 8-1: Summary of the impacts associated with the proposed Plan8 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 Plan8 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	Collision of birds with turbines	MOD-	MOD-
	3	Disturbance and displacement of avifauna	LOW-	LOW-
	4	Disruption of local bird movement patterns	MOD-	N/A
	5	Collision and electrocution of birds with power lines	MOD-	LOW-
Bat	6	Bat mortalities during foraging by turbine blades	HIGH-	MOD-
	7	Bat mortalities during migration by turbine blades	HIGH-	MOD-
Heritage	8	Impact on heritage resources	MOD-	LOW-
Noise	9	Predicted noise levels for wind turbine generators	HIGH-	LOW-
Visual	10	Potential landscape impact	MOD-	MOD-
	11	Impact of shadow flicker on residents in close proximity to wind turbines	Refer to specialist report	
Agriculture	12	Possible change of use of agricultural land	MOD-	LOW-

Table 8-3: Summary of the impacts associated with the proposed Plan8 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-
	Avifauna	12	Habitat destruction	N/A

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

OPERATIONAL	Ecological	1	Invasion of alien species	HIGH-
	Avifauna	2	Collision of birds with turbines	N/A
		3	Disturbance and displacement of avifauna	N/A
		4	Collision and electrocution of birds with power lines	N/A
		Bat	5	Bat mortalities during foraging by turbine blades
	6	Bat mortalities during migration by turbine blades	HIGH+	
	Heritage	7	Impact on heritage resources	MODERATE+
	Agriculture	8	Not proceeding with wind farm construction	MODERATE-
	Noise	9	Predicted noise levels for wind turbine generators	MODERATE+
	Visual	10	Potential landscape impact	MODERATE+
		11	Impact of shadow flicker on residents in close proximity to wind turbines	Refer to specialist report

8.2 EAP's Recommendation

The decision regarding whether to proceed with the proposed development should be based on weighing up of 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;
- The nature of the site on which the facility is to be sited is suited to the development proposal;
- 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 the Makana Municipality (MM), and
- The project will contribute directly and significantly to social upliftment through a community development trust and skills transfer.

Based on the above, it is believed that with appropriate mitigation, the benefits of the proposed Plan8 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 Plan8 Grahamstown Wind Energy Project should be granted authorisation.

The opinion of the EAP was also influenced by the fact that 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 GSDM's current daytime electricity demand.

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 10 of this report. One such condition was that the project proponent furnished the relevant authority with a geotechnical assessment. This study was achieved where the proposed scope of work included trial pits being excavated at each of the current turbine locations using a large tracked excavator. Dynamic Cone Penetration tests will be done on site in close proximity to each trial pit. The trial holes will be profiled and sampled for laboratory testing.

Depending upon the findings of the shallow, trial hole investigation a further, more detailed, geotechnical investigation may be required once the feasibility investigation has been completed.

It is also strongly suggested that the recommendations made in *Volume 4: Environmental Management Programme: Proposed Plan8 Grahamstown Wind Energy Project* (CES, February 2012) also be followed. Of particular relevance is the recently developed avifaunal and bat long-term monitoring programmes that have recently been developed. 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. A selection of what are considered to be the most relevant management actions that are included in Table 10-1 below are, *inter alia*:

Phase	Impact	Mitigation Measures
Construction	Intrusion of large and highly visible construction activity on sensitive viewers	<ul style="list-style-type: none"> • 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 contrast which can be seen from long distances. • Laydown areas and stockyards should be located in low visibility areas (e.g. valley between the ridges) and existing vegetation should be used to screen them from views. • 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.
Operation	Intrusion of large wind turbines on the existing views of sensitive visual receptors	<ul style="list-style-type: none"> • Turbines should not be associated with power lines and similar structures and should be as far removed from them as possible. • The power line connecting the turbine with the grid should be buried. • Maintenance of the turbine is 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

Phase	Impact	Mitigation Measures
		<p>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).</p>
Construction	Noise	<ul style="list-style-type: none"> • All construction operations should only occur during daylight hours if possible. This may not be practical if continuous pouring of the turbine base has to occur. • No construction piling should occur at night. Piling should only occur during the hottest part of the day to take advantage of unstable atmospheric conditions. • Construction staff should receive “noise sensitivity” training.
Operation		<ul style="list-style-type: none"> • The noise impact from the wind turbine generators should be measured during the operational phase, to ensure that the impact is within the recommended limits. • WTG 16 should be moved further away from NSA 16 to meet the minimum setback criteria of 500m .
	Bat fatalities	<ul style="list-style-type: none"> • Turbines should be shut off 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). • 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. • Ultrasound broadcast can deter bats from flying into wind turbines. (Szewczak and Arnett 2007) • Minimizing turbine height will help to reduce bat fatalities (Barclay <i>et al.</i>,2007). • Turbine site placement around water bodies (dams) should be avoided (Brinkman <i>et al.</i>, 2006). • 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).
All	Bird fatalities	<ul style="list-style-type: none"> • A suitably qualified avifaunal specialist should supervise the monitoring programme, train the necessary observers, collate, analyse, report and publish data. • This specialist should be contracted by the developer • The first step for the appointed specialist will be to identify the key information required in the protocol below (highlighted in yellow). This will be best done through a short site visit, which will also serve to train the identified observers and generally iron out any teething problems with the methodologies. • The bulk of the actual work involved should be done by trained observers, under the guidance and supervision of a qualified and experienced ornithologist. This role could be filled by a number of people or entities, but will need to be the same entity for the duration of the programme. • The specialist could advise the developer on available options to source observers <p>Specific challenges in a southern African context</p>

Phase	Impact	Mitigation Measures
		<p>The monitoring protocols that are available from Europe and the USA are mostly aimed at estimating population densities of small passerines in a relatively small study area. In southern Africa, the majority of priority species are large species that are relatively thinly distributed. Specific challenges in a local context are the following:</p> <ul style="list-style-type: none"> • Some priority species are sparsely distributed with large territories, e.g. many of the large raptors and cranes. These species could easily be missed during surveys. • Some priority species are nomadic with fluctuating densities related to habitat conditions, particularly rainfall, e.g. bustards. To cover all possible conditions in the study area would require an effort which will be impractical, both in terms of resources and length of monitoring time. • Some of the sites are extremely remote and access restricted. This means that sample size will be determined by what is practically possible, introducing bias towards areas within the study area which are accessible, and potentially missing important habitat. • Limited availability of suitably experienced individuals that can do monitoring. <p>The suggested monitoring protocol is an attempt to address the challenges listed above whilst still maintaining a measure of practical realism as to what is possible with limited resources.</p> <p>Aims of monitoring:</p> <ol style="list-style-type: none"> 1. To estimate an abundance index for all the priority species within the wind farm area as a baseline to measure potential displacement due to the construction and operation of the wind farm. 2. To estimate the risk of priority species colliding with the wind turbines by recording flight behaviour. Recommended method is vantage point observations. <p>A) Pre-construction monitoring</p> <ol style="list-style-type: none"> 1. Displacement due to the construction and operation of the wind farm: <ol style="list-style-type: none"> <i>1.1 Methodology for calculating an abundance index using line transects:</i> <ul style="list-style-type: none"> • Establish boundaries for the wind farm area (including buffer zones), taking into account the priority species likely to be present, for the area to be surveyed (hereafter referred to as the wind farm area). The experience of the ornithologist will be priority in establishing the buffer zones, the decision to include an area will depend on the priority species that are likely to be present in the wind farm area. It is important that this is done realistically and objectively, taking into account the potential impacts of the wind farm and the availability of resources to conduct the monitoring. • Identify, delineate and calculate the percentage of each distinct habitat type from a priority species perspective in the wind farm area using a combination of satellite imagery (Google Earth) and GIS tools e.g. agricultural land, ridges, fynbos, woodland. • Within the study area, selection of transects will largely depend

Phase	Impact	Mitigation Measures
		<p>on practical factors e.g. access, but ideally transects should cover as much as possible of the study area, and be as representative as possible of all the habitat types. However, it must be accepted that site variance will be unavoidable given varying capacity, time and access. Standardization of monitoring protocols should however always be attempted across studies, especially in similar regions e.g. the Overberg, West Coast, Karoo etc. in order for results to be extrapolated for comparison purposes, with some degree of confidence.</p> <ul style="list-style-type: none"> • Line transects should be counted in summer (from November to March) and in winter (May to August). Transects should be counted at least four times per season. A proposed practical method is for the observer to drive very slowly with a vehicle and stop every 250m and scan the surrounding habitat with binoculars in a 360° radius. All priority species must be recorded. The following data must be recorded: <ul style="list-style-type: none"> ○ Date of count ○ Number of count (each count must be numbered individually) ○ Duration of count i.e. the time it has taken to travel the transect (s) ○ Species ○ Weather conditions ○ Habitat type where the bird is recorded - overflying birds should be noted as such and not linked to a habitat type. In this respect the judgment of the observer will be crucial e.g. a bird that is foraging on the wing in a specific habitat type (e.g. a Black Harrier quartering in fynbos) should be distinguished from a bird that is obviously passing through. • Ideally a similar exercise should be conducted for a control site of similar habitat composition and size, to make post-construction comparisons meaningful. There may be merit in use of shared control or reference sites for several wind farms in a well-defined geographical area. Control sites should have the following characteristics: <ul style="list-style-type: none"> ○ Host a similar mix of bird species present on the wind farm development site. ○ Be similar in size to the wind farm area. ○ Be located on ground with a similar mix of habitats and similar topography and aspect. ○ Be as closely matched as possible to the wind farm site, the main difference being the absence of wind turbines from the control. ○ Be situated as close as possible to the wind farm area without its bird populations being so close as to be affected by wind farm operations. • It is important to record information on priority species occurrence from secondary sources, for example CAR counts or local bird watchers as well. Although this information cannot be analysed as part of the formal protocol, it is nonetheless important, especially if the source is reliable. Typical examples would be if the existence of nesting sites on the property which is known to the landowner. This should be incorporated into the final report. <p>1.2 Output:</p> <ul style="list-style-type: none"> • The main output of the transect monitoring is an abundance index for priority species expressed as species/km for both the wind farm area and the control area. This information will feed into the avifaunal specialist report for the EIA study.

Phase	Impact	Mitigation Measures
		<p>2. Collision risk</p> <p>2.1 Methodology for estimating collision risk using vantage point (VP) observations:</p> <ul style="list-style-type: none"> • Vantage point (VP) observations are a means of quantifying flight activity of priority species that take place within the wind farm area, with the principal aim of determining the likely collision risk. • The purposes of vantage point watches are to collect data on priority species that will enable estimates to be made of: <ul style="list-style-type: none"> ○ The time spent flying over the defined survey area; ○ The relative use of different parts of the defined survey area; ○ The proportion of flying time spent within the upper and lower height limits as determined by the rotor diameter and rotor hub height. ○ The flight activity of other species - secondary species using the defined survey area. • When selecting VPs, the aim should be to cover all of the survey area such that no point is greater than 2km from a VP, but this is not always feasible. • It is very important that VPs are chosen in order to achieve maximum visibility with the minimum number of points. • Typically, a site measuring 1000ha will require at least 2 VP's. • As acuity of observations will decrease with distance, VPs should be located as close to the survey boundary as possible. • VPs should not be located near to the nest site of target species and observers should try to position themselves inconspicuously so as to minimise their effects on bird movements. • Coordinates of VPs must be recorded using a GPS. Observers should take care to re-use the exact VP location in successive watches. • VP observations should be conducted in summer (November to March) and in winter (May to August). A total of 18 hours (two days) of vantage point (VP) observations pre- and post-construction per season per VP should be conducted. VP watches should be conducted in three hour shifts, to account for different levels of bird activity: <ul style="list-style-type: none"> ○ Shift 1: starting one hour before dawn sunrise? ○ Shift 2: starting noon ○ Shift 3: starting two hours before sunset until visibility becomes too low • The following data must be recorded at the start of the watch: <ul style="list-style-type: none"> ○ Watch number ○ Date ○ Start time ○ Wind strength (light, moderate, strong) ○ Wind direction ○ Flight activity for priority species must be recorded in the following manner (number each flying bout consecutively), the use of markers on laminated maps are strongly recommended: <ul style="list-style-type: none"> ▪ Species ▪ Flight duration (starting at time of detection until bird disappears from view) ▪ Flight height (below the rotor arc; within the rotor arc; above the upper rotor arc - recorded at 15 second intervals until bird disappears from sight) ▪ Flight direction recorded at 15 second intervals until bird disappears from sight.

Phase	Impact	Mitigation Measures
		<ul style="list-style-type: none"> ▪ Flight mode recorded at 15 second intervals until bird disappears from site (soaring, gliding, flapping) • Estimation of predicted collision mortality can be undertaken with a model such as that developed by SNH (Scottish Natural Heritage 2000b). Band et al (2007) provide further details, worked examples and discussion. The model leads to an initial estimate of collision risk based on the theoretical assumption that birds take no avoiding action. It is then necessary to build in a more realistic expectation that a high proportion of birds are likely to take avoiding action successfully (see SNH 2000a). Limited information on avoidance rates is available for some species, based on experience at actual wind farms (see SNH 2004). With time, avoidance rates for SA species will need to be established. <p>B) Post-construction monitoring</p> <p>Aims:</p> <ul style="list-style-type: none"> • To compare the abundance index for all the priority species within the development area after construction against the pre-construction baseline to measure actual displacement due to the construction and operation of the wind farm. Recommended survey method is line transect counts (see A above). • To estimate the risk of priority species colliding with the wind turbines by recording actual collisions and comparing post-construction flight patterns with pre-construction baseline data. Recommended methods are carcass searches and VP watches (see A above). <p>1. Displacement due to the construction and operation of the wind farm:</p> <p><i>1.1 Methodology for calculating abundance</i> conducted in two seasons of years 1, 2, 3, 5, 10 and 15; after the wind farm becomes operational. Bird responses to wind farms may operate over very long periods of time, and that monitoring needs to take this into account, as results from short term observational <i>index using line transects</i>:</p> <ul style="list-style-type: none"> • Methodology has been fully covered under A above. • Ideally, surveys should be studies are unlikely to be representative. <p>2. Collision risk</p> <p><i>2.1 Methodology for estimating actual collision rates using carcass searches:</i></p> <ul style="list-style-type: none"> • Carcass searches are the most direct way of estimating the number of collisions and hence the likely impact on species of conservation importance. Measures of the number of collisions can also help to quantify avoidance rates (as used in collision risk modelling calculations), and, when collisions can be ascribed to a particular time, contribute to an understanding of environmental conditions and behaviours that increase collision risk. • The value of surveying the area for collision victims only holds if some measure of the accuracy of the survey method is developed. To do this, a sample of suitable bird carcasses (of similar size and colour to the priority species – e.g. Egyptian

Phase	Impact	Mitigation Measures
		<p>Goose <i>Alopochenaeegyptiacus</i>, domestic waterfowl and pigeons) should be obtained and distributed randomly around the site without the knowledge of the surveyor, sometime before the site is surveyed. This process should be repeated opportunistically (as and when suitable bird carcasses become available) for the first two months of the monitoring period, with the total number of carcasses not less than 20. The proportion of the carcasses located in surveys will indicate the efficiency of the method.</p> <ul style="list-style-type: none"> • Simultaneous to this process, the condition and presence of all the carcasses positioned on the site should be monitored throughout the initial two-month period, to determine the rates at which carcasses are scavenged from the area, or decay to the point that they are no longer obvious to the surveyor. This should provide an indication of scavenge rate that should inform subsequent survey work for collision victims, particularly in terms of the frequency of surveys required to maximise survey efficiency and/or the extent to which estimates of collision frequency should be adjusted to account for scavenge rate. Scavenger numbers and activity in the area may vary seasonally so, ideally, scavenge and decomposition rates should be measured twice during the monitoring year, once in winter and once in summer. • The area within a radius of at least 50m of each of the turbines (from the outer edge of rotor zone) at the facility should be checked regularly for bird casualties. The frequency of these surveys should be informed by assessments of scavenge and decomposition rates conducted in the initial stages of the monitoring period (see above), but they should be done at least weekly for the first two months of the study. The area around each turbine, or a larger area encompassing the entire facility, should be divided into quadrants, and each should be carefully and methodically searched for any sign of a bird collision incident (carcasses, dismembered body parts, scattered feathers, injured birds). All suspected collision incidents should be comprehensively documented, detailing the precise location (preferably a GPS reading), date and time at which the evidence was found, and the site of the find should be photographed with all the evidence in situ. All physical evidence should then be collected, bagged and carefully labelled, and refrigerated or frozen to await further examination. If any injured birds are recovered, each should be contained in a suitably-sized cardboard box. The local conservation authority should be notified and requested to transport casualties to the nearest reputable veterinary clinic or wild animal/bird rehabilitation centre. In such cases, the immediate area of the recovery should be searched for evidence of impact with the turbine blades, and any such evidence should be fully documented (as above). <p><i>2.2. Methodology for comparing post-construction flight patterns with pre-construction baseline data using Vantage point watches</i></p> <ul style="list-style-type: none"> • Methodology has been fully covered under A above. <p>In addition to the above monitoring, which will take place largely 'on site', there is a need to do off site counts of Greater Flamingo at the nearby estuaries and salt pans identified by this study. More details on this will be developed by the appointed avifaunal specialist.</p>

8.3 The Way Forward

Following public review, this Draft EIR, together with the Specialist Volume (Volume 2) and the EMP (Volume 4), will be amended as necessary and finalised, incorporating any comments received. It will then 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.

DRAFT

REFERENCES

- Ahlen, I. (2003). Wind turbines and bats – A pilot study. Swedish National Energy Administration.
- Baerwald, E.F., D'Amours, G.H., Klug, B.J. and Barclay, R.M.R. (*n.d.*). Barotrauma is a significant cause of bat fatalities at wind turbines. *Current Biology* 18(16): R695 - R696.
- Barclay, R.M.R., Baerwald, E.F., Gruver, J.C., 2007. Variation in bat and bird fatalities at wind energy facilities: assessing the effects of rotor size and tower height. *Canadian Journal of Zoology* 85, 381–387.
- Barnes, K.N. (ed.), 2000. The Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland.
- Birdlife 2008: Birdlife South Africa, Johannesburg, 169p.
- Branch, W.R., 1988. Terrestrial reptiles and amphibians. In: *A Field Guide to the Eastern Cape Coast*, R. A. Lubke, F. W. Gess and M. N. Bruton (eds.), Grahamstown Centre for the Wildlife Society of South Africa., 251-264.
- Brinkman, R., Schauer-Weissahn, H. and Bontadina, F., (2006). Survey of possible operational impacts on bats by wind facilities in Southern Germany. Final Report submitted by the Administrative District of Freiburg, Department of Conservation and Landscape management and supported by the foundation Naturschutzfonds Baden-Wurttemberg. Brinkmann Ecological Consultancy, Gundelfingen/Freiburg, Germany.
- Cape Nature and Environmental Conservation Ordinance (1997). Ordinance No. 19 of 1974, Schedule 4, 11–18.
- CSIR, 2004. 2004 Eastern Cape State of the Environment Report. CSIR Division of Water, Environment and Forestry Technology. Durban, South Africa. Produced on behalf of the Eastern Cape Department of Economic Affairs, Environment and Tourism, Bisho.
- Dewey and LeBoeuf LLP, 2009. Client Alert – South Africa's REFIT Programme Starts to Take Shape. Dewey and LeBoeuf LLP, NewYork.
- Dold, A.P., 2002. A taxonomic revision of the genus *Bergeranthus* Schwantes (Mesembryanthemaceae) in South Africa. MSc Thesis, Rhodes University.
- Everard, D.A., 1988. Threatened plants of the Eastern Cape: a synthesis of collection records. *Bothalia*. 18: 271-277.
- Ferrar, A.A.&Lotter, M.C., 2007. Mpumalanga Biodiversity Conservation Plan Handbook. Mpumalanga Tourism & Parks Agency, Nelspruit.
- Friedmann, Y. and Daly, B. (eds.), 2004. Red Data Book of the Mammals of South Africa: A Conservation Assessment. CBSG Southern Africa, Conservation Breeding Specialist Group (SSG/IUCN), Endangered Wildlife Trust, South Africa. 722p.
- Frost, D., 1985. *Amphibian species of the World*, Association of Systematic Collections, Kansas, 732p.
- Gelderblom, C.M., Bronner, G.N., Lombard, A.T. & Taylor, P.J., 1995. Patterns of distribution and current protection status of the Carnivora, Chiroptera and Insectivora in South Africa. *S. Afr. J. Zool.* 30: 103-114.

Hilton-Taylor, C. 1996. *Red Data List of Southern African Plants*. National Botanical Institute, Pretoria.

Horn, J.W., Arnett, E.B. and Kunz, T.H., 2008. Behavioral Responses of Bats to Operating Wind Turbines. *Journal of Wildlife Management* 72(1): 123- 132.

Hotker, H., Thomsen, K.M. and Jeromin, H., 2006. Impacts on biodiversity of exploitation of renewable energy sources: the example of birds and bats – facts, gaps in knowledge, demands for further research, and ornithological guidelines for the development of renewable energy exploitation. Michael-Otoo-Institutim NABU, Bergenhusen.

IUCN ,2009. Red List of Threatened Species. IUCN Species Survival Commission, Cambridge Available: <http://www.iucnredlist.org/> (Accessed 12/10/2009).

Jacobsen, N.H.G., 1989. *A Herpetological survey of the Transvaal*. The Transvaal Directorate of Nature and Environmental Conservation

Johnson, C.F., 1998. Vulnerability, Irreplaceability and Reserve Selection for the Elephant-impacted Flora of the Addo Elephant National Park, Eastern Cape, South Africa. MSc Thesis, Rhodes University.

Johnson GD, Erickson WP, Strickland MD, Shepherd MF, Shepherd DA and Sarappo SA (2003). Mortality of Bats at a Large-scale Wind Power Development at Buffalo Ridge, Minnesota. *American Midland Naturalist*. 150: 332 – 342.

Kunz, T.H., Arnet, E.B., Erickson, W.P., Hoar, A.R., Johnson G.D., Larkin, R.P., Strickland, M.D., Thusher, R.W. and Tuttle, M.D., 2007. Ecological Impacts of wind energy development on bats: questions, research needs, and hypotheses. *Frontiers in Ecology and the Environment*. 5(6): 315 – 324.

Lubke, R.A., 1998. The Coastal Environment. In: *Field Guide to the Eastern and Southern Cape Coasts*. Eds: Lubke, R.A. and de Moor, I. The University of Cape Town Press. ISBN: 1-919713-03-4.

Marker, M.E., 1988. Geology and geomorphology. In: *A field guide to the eastern Cape coast*. Eds: Lubke, R.A., Gess, F.W. and Bruton, M. The Grahamstown Centre of the Wildlife Society of Southern Africa.

Mucina, L. & Rutherford, M.C. (eds), 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.

Parsons Brinckerhoff, 2011. *Update of UK Shadow Flicker Evidence Base - Final Report*, London, England: Department of Energy and Climate Change.

Picker, M., Griffiths, C. and Weaving, A., 2002. *Field Guide to Insects of South Africa*. Struik Publishers. Cape Town. Pp 440. ISBN: 1-86872-713-0.

Pierce, S. M. and Mader, A. D., 2006. The STEP Handbook. Integrating the natural environment into land use decisions at the municipal level: towards sustainable development. Centre for African Conservation Ecology (ACE). Report Number 47 (Second Edition). Nelson Mandela Metropolitan University, South Africa.

Rust I.C., 1998. Geology and geomorphology. In: Field Guide to the Eastern and Southern Cape Coasts. Eds: Lubke, R.A. and de Moor, I. The University of Cape Town Press. ISBN: 1-919713-03-4. p 10 -26.

Scholtz, C.H. and Holm, E., 1996. Insects of Southern Africa. University of Pretoria. 502pp. ISBN: 0-409-10487-6.

Skinner, J.D., and Chimimba, C.T., 2005. The Mammals of the Southern African Subregion. 3rd ed. Cambridge University Press.

Skinner, J.D. and Smithers, R.H.N., 1990. The Mammals of the Southern African Subregion. University of Pretoria, Pretoria.

Smithers, R.H.N., 1986. South African Red Data Book Mammals. South African National Scientific Programmes Report 125: 1-216.

Statistics South Africa (Stats SA) Census Community Survey, 2007. Available at <http://www.statssa.gov.za/census01/html/C2001Interactive.asp> (Accessed on 11 October 2010)

Statistics South Africa (Stats SA) Census, 2001 Available at <http://www.statssa.gov.za/census01/html/C2001Interactive.asp> (Accessed on 11 October 2010)

Szewczak J.M. and Arnett, E.B., 2007. Field test results of a potential acoustic deterrent to reduce bat mortality from wind turbines.

Van Wyk, A.E. & Smith, G.F., 2001. *Regions of Floristic Endemism in Southern Africa. A Review with Emphasis on Succulents*. Pretoria: Umdaus Press.

Victor, J. E., and Dold, A. P., 2003. Threatened plants of the Albany Centre of Floristic Endemism, South Africa. *South African Journal of Science*, 99: 437-446.

Vlok, J.H.J & Euston-Brown, D.I.W, 2002. *The patterns within, and the ecological processes that sustain, the Subtropical Thicket Vegetation in the planning domain for the Subtropical Thicket Ecosystem Planning (Step) Project* . Terrestrial Ecology Research Unit, University of Port Elizabeth, Port Elizabeth. Report No. 40

APPENDICES

APPENDIX A:	THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS
APPENDIX B:	LETTER FROM DEA ACKNOWLEDGING RECEIPT OF THE FINAL SCOPING REPORT AND PLAN OF STUDY
APPENDIX C:	PLAN OF STUDY APPROVAL
APPENDIX D:	PUBLIC PARTICIPATION
APPENDIX E:	COPIES OF TITLE DEEDS
APPENDIX F:	LETTER FROM DWA CONFIRMING WATER AVAILABILITY FOR CONSTRUCTION PHASE

DRAFT

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 Plan8 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 Plan8 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 Plan8 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 Plan8 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- theseverity/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

EFFECT	Temporal scale		Score
	Short term	Less than 5 years	1
	Medium term	Between 5 and 20 years	2
	Long term	Between 20 and 40 years (a generation) and from a human perspective almost permanent.	3
	Permanent	Over 40 years and resulting in a permanent and lasting change that will always be there	4
	Spatial Scale		
	Localised	At localised scale and a few hectares in extent	1
	Study area	The proposed site and its immediate environs	2
	Regional	District and Provincial level	3
	National	Country	3
International	Internationally	4	
LIKELIHOOD	Severity		Benefit
	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)
Likelihood			
Unlikely	The likelihood of these impacts occurring is slight		1
May Occur	The likelihood of these impacts occurring is possible		2
Probable	The likelihood of these impacts occurring is probable		3
Definite	The likelihood is that this impact will definitely occur		4

** 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

Likelihood		Effect													
		3	4	5	6	7	8	9	10	11	12	13	14	15	16
	1	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	3	6	7	8	9	10	11	12	13	14	15	16	17	18	19
4	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
LOW	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
MODERATE	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
HIGH	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
VERY HIGH	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
With Mitigation	Short term	1	Localised	1	Slight	1	Unlikely	1	4
Overall Significance without mitigation									MODERATE
Overall Significance with mitigation									LOW-

**APPENDIX B: LETTER FROM DEA ACKNOWLEDGING RECEIPT OF THE
FINAL SCOPING REPORT AND PLAN OF STUDY**



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: imaswime@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 Mmatlala Rabothata

Designation: PEO: Environmental Impact Evaluation

Date: 14/02/2012

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 ongoing 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 will be 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 000m², or the rezoning or change of land use of a site exceeding 10 000 m², 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

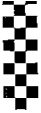
Bat (Chiroptera) Impact Assessment

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.

DRAFT



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

Private Bag X 447· PRETORIA · 0001· Fedsure Building · 315 Pretorius Street · PRETORIA
Tel (+ 27 12) 310 3911 · Fax (+ 2712) 322 2682

NEAS Reference: DEA/EIA/0000679/2011

DEA Reference: 12/12/20/2523

Enquiries: Sindiswa Dlomo

Telephone: 012 395 -1856 Fax: 012-320-7539 E-mail: Sdlomo@environment.gov.za

Mr. Hylton Newcombe
Coastal and Environmental Services
P.O. Box 934
GRAHAMSTOWN
6140

Telephone: (046) 622-6564
Fax No: (046) 622-2364
Email: h.newcombe@cesnet.co.za

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.

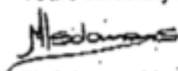
6. In addition, the following amendments and additional information are required for the EIR:
 - Details of the future plans for the site and infrastructure after decommissioning in 20-30 years and the possibility of upgrading the proposed infrastructure to more advanced technologies.
 - Should a Water 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



DK

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 DEIR provides the details of the public participation process conducted for the proposed Plan8 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 processmust 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 Plan8 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 Plan8 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 19th and 16th of September 2011 respectively in order to:-

- Advise readers of the intention to undertake an EIA for the proposed Plan8 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 D-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 Plan8 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 advertisement will be placed in Grocott's Mail and The Herald newspapers in order to:-

- Advise I&APs of the release of the Draft EIA Report for the proposed Plan8 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.

This advertisement will be reflected within the Final EIA report.

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 - 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 4th 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 Plan8 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 Plan8 Grahamstown Wind Energy Project (Coastal & Environmental Services, January 2012: *Final Environmental Scoping Report: Proposed Plan8 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 23rd 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

A hard copy of this Draft EIR will be made available for inspection by the public for a period of 40 days at the Grahamstown Main Public Library. In addition, an electronic version of the Draft EIA report will be available on CES' website, and can be uploaded under the tab, *Public Documents*.

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 B-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 18th 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:



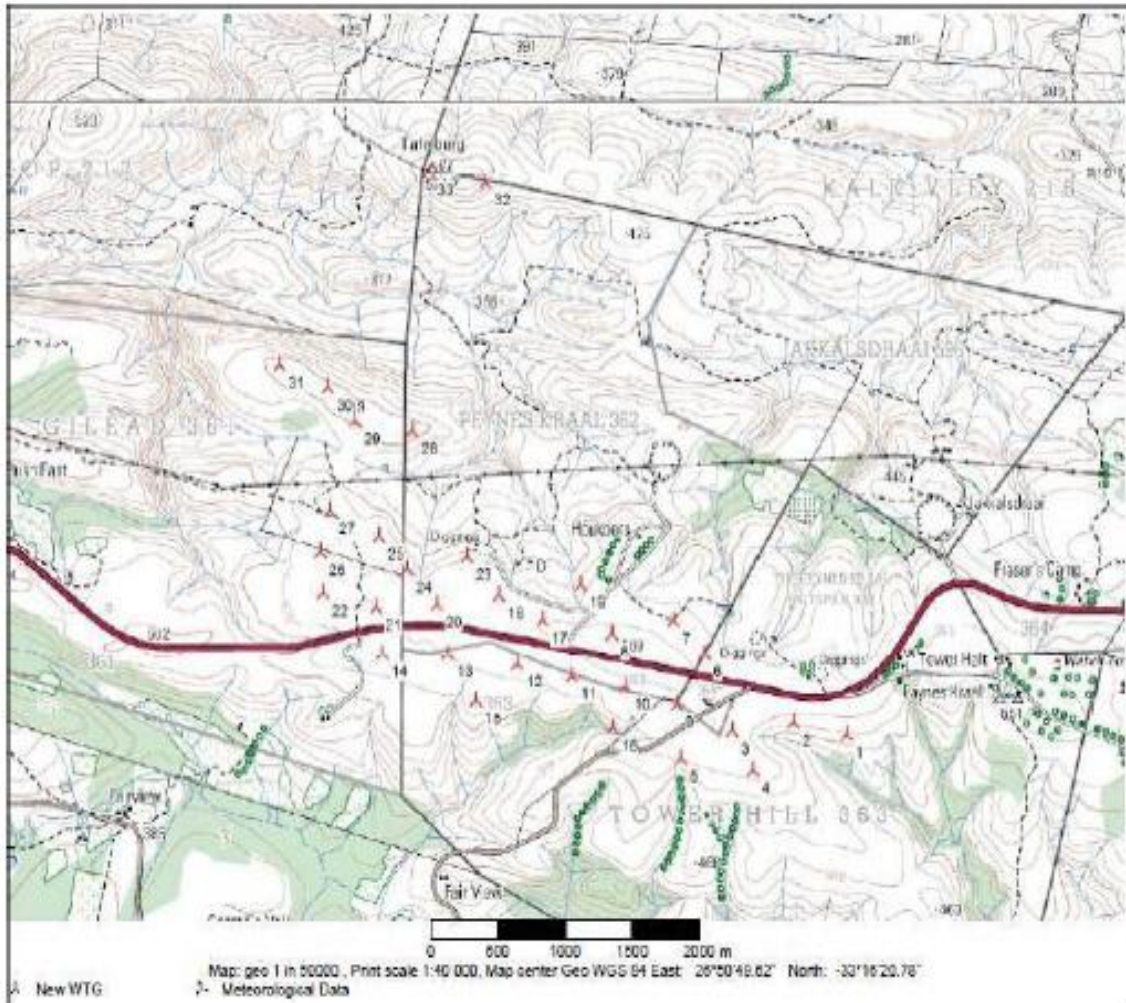


Figure 2: Locality map showing the location of the proposed wind farm and turbine layout

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 B-2: CONTACT DETAILS AND COPY OF LETTER SENT TO LAND OWNERS AND OCCUPIERS OF LAND IMMEDIATELY SURROUNDING AND WITHIN 100m OF THE PROPOSED PLAN8GRAHAMSTOWN 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	gbd@geenet.co.za	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)		waynenortier@gmail.com felicity@deklerk-devilliers.co.za	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	claypits@geenet.co.za	
OrgieCrous	Farmer - Honeykop No361	46622 8474	82660997 4	46622 8474	no email address	PO BOX 362, Grahamstown, 6140
Jeremy Allan			82784680 5		jjrallan@yahoo.com	17 Milner strGrahamstown
Gilbert Coetzee	Coombesvale		82808596 1		gmd@geenet.co.za	POBOX 2204 Grahamstown 6140
James Williamson	Glenvoid		82441205 5		james@geenet.co.za	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		valleyview@xfinet.co.za	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



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

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,

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 Rowlston (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)

APPENDIX B-3: CONTACT DETAILS AND COPIES OF THE LETTERS SENT TO GOVERNMENT DEPARTMENTS, MUNICIPALITIES AND OTHER KEY STAKEHOLDERS AND PROOF OF REGISTERED 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)				Briant.Noncembu@deaet.ecape.gov.za	Private Bag X5029 Mthatha 5099
Carin Swart	DEDEA				Carin.Swart@deaet.ecape.gov.za	
Dan Malgas	DAFF Forestry				MalgasM@dwaf.gov.za	
S. Gwen	DAFF Forestry	(043) 604 5301			gwendolines@daff.gov.za	
Anneliza Collitt	DAFF Agri				annelizac@nda.agric.za	
M Mathekgana	Dept of Energy	(012) 444-4261			mokgadi.mathekgana@energy.gov.za	
<i>Municipality</i>						
Ntonek Ncweka	Makana Municipality			072 8195472	ntontela@makana.gov.za	
Anele Kwayimani	Makana Municipality	046 622 9186	046 603 6062	083 6955 406	anele.kwayimani@webmail.co.za	
Xhanli Bokue	Makana Municipality			083 335 4843		
Casa Yonela	Makana Municipality			072 13302 92	casayo@webmail.co.za	
<i>Key Stakeholders</i>						
Nanna Gouws	SANRAL				GouwsJ@nra.co.za	
Mariagrazia Galamberti	SAHRA				mgalimberti@sahra.org.za	
Xolani Wana	ESKOM				Xolani.Wana@eskom.co.za	
Lizelle Stroh	SACAA				strohl@caa.co.za	
Irene de Moor	WESSA				irenedemoor@imaginiet.co.za	
Jenny Gon	WESSA				j-gon@intekom.co.za	PO Box 73, Grahamstown, 6140

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

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

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



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

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.

- 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: oesel@oesnet.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 Rowlston (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



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

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.

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 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



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

South African Civil Aviation Authority
Private Bag X73
Halfway House
1685

To Whom It May Concern

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

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



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

Mrs Anneliza Collett,
Directorate: Land Use and Soil Management,
Department of Agriculture, Forestry and Fisheries
Private Bag X250,
Pretoria,
0001

ATTENTION: Mrs Anneliza Collett

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: oesel@oesnet.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



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

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

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

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 Rowlston (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



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

Department of Water Affairs
P.O. Box 7019
EAST LONDON
5200

ATTENTION: Ms Lizna Fourie

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

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



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

ESKOM Holdings Limited
Private Bag X1
Beacon Bay
5205

ATTENTION: Mr. Tom Smith,

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

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



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

South African Heritage Resources Agency
P.O. Box 759
EAST LONDON
5200

ATTENTION: The Provincial Manager

CC: The Provincial Manager Western Cape Provincial Office

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

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)

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



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

19 October 2011

Pumzo Mdleleni
Vodacom
Vodacom SA Eastern Region
P.O. Box 27504
Greenacres
Port Elizabeth,
6004

ATTENTION: Pumzo Mdleleni,

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

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



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

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

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

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 Rowlston (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



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 April 2012

Adv. Rolly Dumezweni
Ndlambe Local Municipality
P.O. Box 13
Port Alfred
6170

ATTENTION: Municipal Manager-Adv. Rolly Dumezweni

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.

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 and Ndlambe Municipalities in the Eastern Cape Province of South Africa. The proposed project is planned to host up to 27 turbines, each with a nominal power output ranging between 2-3 Mega Watts (MW). The total potential output of the wind farm would be 67.5MW. 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.
- Public meetings will be held to present the project and to give the public an opportunity to comment on proposed development. You will be notified of the date, time and venue for the public meetings the 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. Jadon Schmidt at the CES Grahamstown office numbers shown above.

Yours sincerely,

Jadon Schmidt
Senior 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

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- REGISTERED LETTER RD 665 761 577 ZA CUSTOMER COPY 381028R
1	MS LERNA FOURIE - DEPT OF WATER AFFAIRS PO BOX 7019 EAST LONDON 5200					REGISTERED LETTER RD 665 761 585 ZA CUSTOMER COPY 381028R
2	MS. M MATHEKGANA -DEPT. OF ENERGY PIBAKI 159 PRETORIA 0021					REGISTERED LETTER RD 665 761 550 ZA CUSTOMER COPY 381028R
3	DYOBANI BYANEH 262 B GRAHAMSTOWN 6140					REGISTERED LETTER RD 665 761 563 ZA CUSTOMER COPY 381028R
4	FRED BITTANAY -VALLEVIEW 1 KAASVEL PO BOX 2225 GRAHAMSTOWN 6140					REGISTERED LETTER RD 665 761 546 ZA CUSTOMER COPY 381028R
5	ANDRE CRETZEE PO BOX 267 GRAHAMSTOWN 6140					REGISTERED LETTER RD 665 761 532 ZA CUSTOMER COPY 381028R
6	JAMES WILLADSON - GLENVOID 45 KINGSDOWN ESTATE MILES ROAD GHT 6140					REGISTERED LETTER RD 665 761 648 ZA CUSTOMER COPY 381028R
7	GILBERT CRETZEE - COOMBUSVALE PO BOX 2204 GHT 6140					REGISTERED LETTER RD 665 761 634 ZA CUSTOMER COPY 381028R
8	JEREMY ALLAN 17 MILNER STREET GHT 6140					REGISTERED LETTER RD 665 761 625 ZA CUSTOMER COPY 381028R
9	ORGIE CEOLUS -HONEYKOP N0301 PO BOX 362, GRAHAMSTOWN 6140					REGISTERED LETTER 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.



701248

LEBONE LITHO PRINTERS (PTY) LTD.

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/Navrae
 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-kliantstelsel	
1	MOENE & MARTE ELWEE - TOWER HALL FARM FAIRVIEW FARM KOOBESVALLEY GBT 6140					REGISTERED LETTER (with a domestic insurance option) ShareCall 0800 111 502 www.saps.co.za 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) ShareCall 0800 111 502 www.saps.co.za RD 665 761 594 ZA CUSTOMER COPY 301028R	
3	MRS ANJELIZA CALET - DEPT OF AGIC, FORESTRY & FISHERIES P/BAG X250 PRETORIA 001					REGISTERED LETTER (with a domestic insurance option) ShareCall 0800 111 502 www.saps.co.za 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) ShareCall 0800 111 502 www.saps.co.za RD 665 761 705 ZA CUSTOMER COPY 301028R	
5	TO MEMORIAL WAY COVEN - SA CAA P/BAG X73 HALFENY HOUSE 1685					REGISTERED LETTER (with a domestic insurance option) ShareCall 0800 111 502 www.saps.co.za 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) ShareCall 0800 111 502 www.saps.co.za 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) ShareCall 0800 111 502 www.saps.co.za RD 665 761 651 ZA CUSTOMER COPY 301028R	
8	MRS NDIWIKHAYA BALET - MAFAMA L.M CITY HALL HIGH STREET GHT 6140					REGISTERED LETTER (with a domestic insurance option) ShareCall 0800 111 502 www.saps.co.za RD 665 761 665 ZA CUSTOMER COPY 301028R	
9	MR. LEON ELS - DEDEA P/BAG X5001 GREENACRES PE 6057					REGISTERED LETTER (with a domestic insurance option) ShareCall 0800 111 502 www.saps.co.za RD 665 761 722 ZA CUSTOMER COPY 301028R	
10	ADMIN OFFICER - DEPT OF ENV AFFAIRS P/BAG X447 PRETORIA 001					REGISTERED LETTER (with a domestic insurance option) ShareCall 0800 111 502 www.saps.co.za RD 665 761 719 ZA CUSTOMER COPY 301028R	
		Total	Totaal	R	R	R	R

Number of letters posted 10/ten
 Getal briewe gepos

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.



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.



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 PLAN8GRAHAMSTOWN WIND ENERGY PROJECT

THE EP HERALD(Provincial) – 2nd 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) – 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. 0211152294/W0

GROCOTT'S MAIL (Local) – – 4th 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) ☐ 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.

Visit
www.grocotts.co.za

APPENDIX B-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 PLAN8 GRAHAMSTOWN WIND ENERGY PROJECT

PROPOSED DEVELOPMENT OF THE PLAN8 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). Plan8 (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 B5 – 1: Site notice erected at the entrance to the Farm Gilead. GPS co-ordinates (33.282154 S; 26.83058 E)



Plate B5 – 2: Site notice erected at the entrance to the Farm Tower Hill. GPS co-ordinates (33.285775 S; 26.862073 E)



Plate B5 – 3: Site notice erected at the entrance to the Farm Peynes. GPS co-ordinates (33.283142 S; 26.847159 E)

APPENDIX B-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		EMAIL
				CELL PHONE		
P. de Kleer	Box 160 6417	0828095425	046-6223118			ponie@chubb-b-dewillias.co.za
K. McCrow	P.O. Box 362 GHT	046 6228171	046 6228171			
O. Crows	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
W.L. Nortier	P.O. Box 19	046-6361810 0823193207	040-608832		0823193207	wayne.nortier@gmail.com
M.S. Enwee	P.O. Box 621	0823007730	0466360011		0823007730	jmicheaux@zazu.co.za
M.S. Miller					0825921664	
P. MINI	40 HIGH STREET	046 622 7222	-		-	p.mini@grocotts.co.za
J. Gov	P.O. Box 73 GHT	046 622 5822(4)	-		-	j-gov@intekom.co.za
R. Cooper		046 622 5153 082747188			082747188	robert@terra-power.co.za
Z. Jossa	105 NEW CHURCH ST. - CAPE TOWN					Zuber.Jossa@shaw-8.co.za

APPENDIX B-6: PHOTOGRAPHS OF THE PUBLIC MEETING HELD AT THE GRAHAM HOTEL, GRAHAMSTOWN



DRAFT

APPENDIX B-7: MINUTES OF THE PUBLIC MEETING HELD AT THE GRAHAM HOTEL, GRAHAMSTOWN

Infinite Plan8 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 Plan8 (IP8)
Mr J Cope	Infinite Plan8 (IP8)
Mr A Oswald	Nordex
Mr H Newcombe	Coastal & Environmental Services, Ght (CES)
Mr W Rowlston	Coastal & Environmental Services, Ght

Comment: Ms P Mini
I've heard there is a wind farm planned for the Grahamstown industrial area: is this the one we're discussing.
Response: CES
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
Comment: Mr O Crous
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?
Response: IP8
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..
Comment: Mr O Crous
Is it correct that the distance of a turbine from a property boundary should be 1.5 times the height to the hub?
Response: IP8
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.
Comment: Mr O Crous
How far is the nearest turbine from the nearest occupied dwelling?
Response: IP8
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.
Comment: Mr O Crous
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.
Response: IP8
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.
Comment: Mr O Crous
What does the data from the meteorological mast tell you so far?
Response: IP8

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.
Comment: Mr O Crous
At my house the prevailing wind direction is south west.
Response: IP8
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
Comment: Mr O Crous
There is a possibility that the N2 may be realigned in this area.
Response: CES
Thank you: we will investigate this with SANRAL
Comment: Mr GL Dixon
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?
Response: IP8
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.
Comment: Mr GL Dixon
How will this 2% ownership work?
Response: IP8
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.
Comment: Mr O Crous
What does 2% mean? 2% of what, and when will this be clarified.
Response: IP8
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.
Comment: Mr GL Dixon
Mr Krous owns a game lodge, and I don't understand why he hasn't said as much.
Response: Mr O Crous
The occupant of the lodge was unable to be here, and I don't want to speak on his behalf.
Comment: Mr O Crous
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.
Response: IP8, Nordex, CES
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.
Comment: Mr GL Dixon
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.
Response: CES
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 Plan8 will be communicated to the regulatory authority as completely and as accurately as possible.
Comment: Mr GL Dixon
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?
Response: IP8, CES
These are interesting proposal, and we will consider them, but it is doubtful if Eskom will agree to such a proposal.
Comment: Ms P Mini
The planned output from the windfarm is 80MW. But what does this mean?
Response: IP8, Nordex
In very rough terms 80MW is sufficient to provide power to about 6 000 middle-class homes.
Comment: Mr P de Klerk
Do the turbines pose a fire hazard?
Response: Nordex
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.
Comment: Mr O Crous
Could you explain the bid process in more detail? Is it competitive?
Response: IP8
The bid process is competitive. It is adjudicated by the National Energy Regulator of South Africa (NERSA). 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 NERSA is currently R 1.15 per kilowatt hour. We will try to make further information available to all interested persons on the subject.

APPENDIX B-8: COMMENTS REPORT (ISSUES AND RESPONSE TRAIL) AS IT STANDS ON 12 JANUARY 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.

Raised By:	Event & Date	Issue, Concern, Comment Please see Appendix B-9 for a copy of these letters.	Response
Visual Issues			
O. Crous Neighbouring Landowner	12/12/2011 via email	<ol style="list-style-type: none"> Any lights on structures to 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 seen from the homestead? 	Noted. A visual specialist study will be undertaken during the EIR phase of the project.
Murray Crous Petra Schutrops Neighbouring Landowner of Bushmans Gorge Lodge and Settlers Safaris hunting outfit	14/12/2011 via email	<ol style="list-style-type: none"> The N2 between Grahamstown and Peddie is already a very dangerous stretch of road, this can be seen in the amount of accidents and fatalities, by erecting turbines visible from the N2 this 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. 	
Noise Issues			
O. Crous Neighbouring Landowner	12/12/2011 via email	<ol style="list-style-type: none"> I want to know what the noise level would be if the wind blows in the direction of my homestead. 	Noted. A noise specialist study will be undertaken during the EIR phase of the project
Murray Crous Petra Schutrops Neighbouring Landowner of Bushmans Gorge Lodge and Settlers Safaris hunting outfit	14/12/2011 via email	<ol style="list-style-type: none"> 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. 	
Avifaunal Issues			

<p>O. Crous Neighbouring Landowner</p>	<p>12/12/2011 via email</p>	<ul style="list-style-type: none"> 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. 	<p>Avifaunal issues will be dealt with extensively during the EIR phase by an avifaunal specialist</p>
<p>Murray Crous Petra Schutrops Neighbouring Landowner of Bushmans Gorge Lodge and Settlers Safaris hunting outfit</p>	<p>14/12/2011 via email</p>	<ol style="list-style-type: none"> 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. 	
<p>Impact on other Businesses</p>			
<p>O. Crous Neighbouring Landowner</p>	<p>12/12/2011 via email</p>	<ol style="list-style-type: none"> 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 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. 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>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>Murray Crous Petra Schutrops Neighbouring Landowner of Bushmans Gorge Lodge and Settlers Safaris hunting outfit</p>	<p>14/12/2011 via email</p>	<ol style="list-style-type: none"> 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 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. 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>Dave De La Harpe Director of Amaraka Investments No. 6 (Pty) Limited</p>	<p>14/12/2011 via email</p>	<p>1. 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>Social Issues</p>			
<p>O. Crous Neighbouring Landowner</p>	<p>12/12/2011 via email</p>	<p>1. 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.</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>General Issues</p>			
<p>O. Crous Neighbouring Landowner Mr PumzoMdleleni: Vodacom</p>	<p>12/12/2011 via email</p>	<p>1. The project must not negatively affect television, cell phone, Telkom landline or internet reception.</p>	<p>The turbines don't have any affect 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.</p>

APPENDIX B-9: COMMENTS REPORT

Windfarm : N2 - Message (HTML)

File Message

Ignore, Junk, Delete, Reply, Reply All, Forward, Meeting, More, Move, OneNote, Actions, Mark Unread, Categorize, Follow Up, Translate, Find, Related, Select, 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, Junk, Delete, Reply, Reply All, Forward, Meeting, More, Move, OneNote, Actions, Mark Unread, Categorize, Follow Up, Translate, Find, Related, Select, 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.

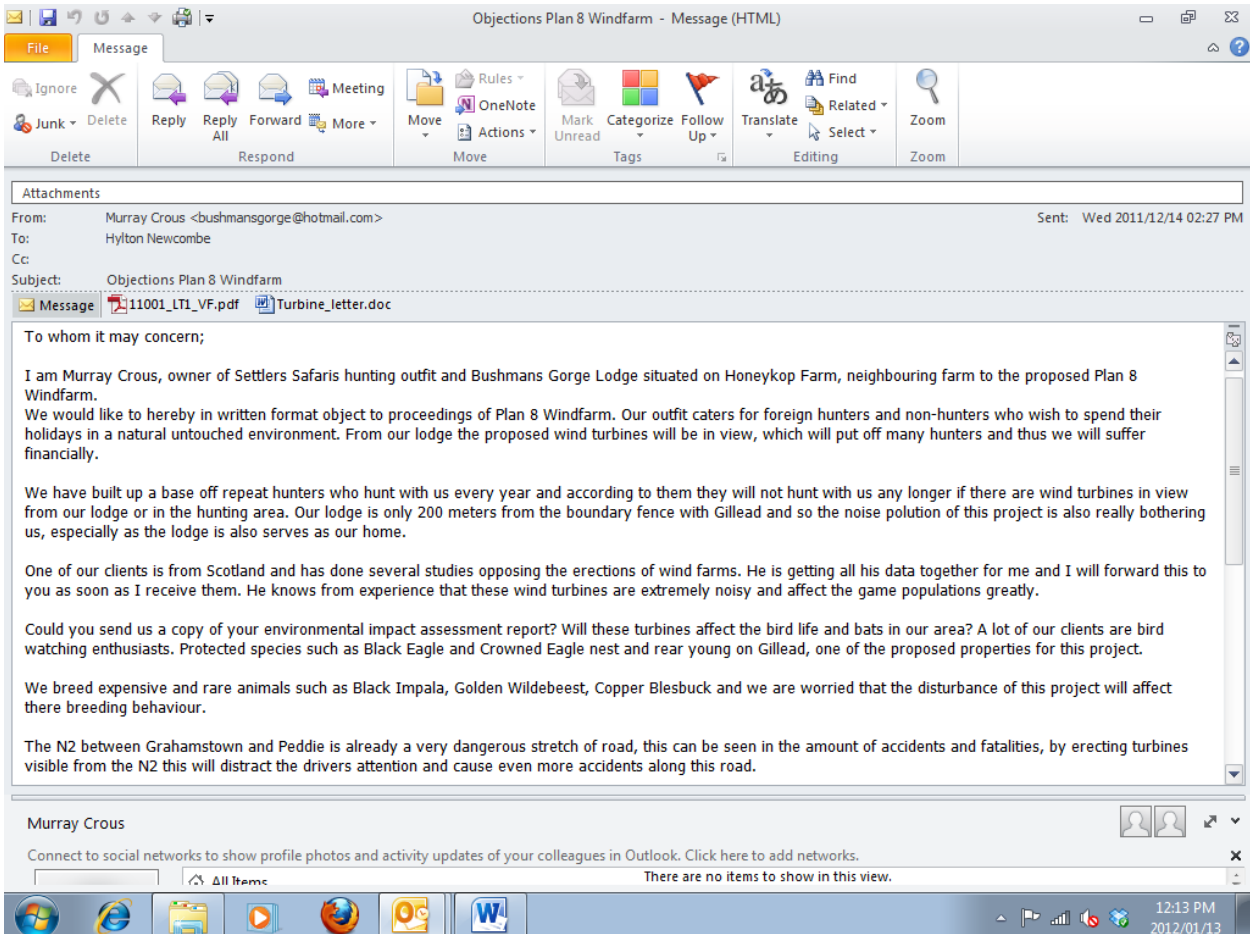
- 9. Regarding the 2% benefit to the community, I feel it should be benefiting the surrounding community who are affected by the project and not some distant urban community who are not affected by the project.
- 10. Regarding above point 8, I want to see the Coombs Agricultural Association being involved. 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



The screenshot shows an Outlook window titled "Objections Plan 8 Windfarm - Message (HTML)". The interface includes a ribbon with "File" and "Message" tabs, and various action buttons like "Ignore", "Junk", "Delete", "Reply", "Forward", "Move", "Mark Unread", "Categorize", "Follow Up", "Translate", "Find", "Related", "Select", and "Zoom".

Attachments:
From: Murray Crous <bushmansgorge@hotmail.com> Sent: Wed 2011/12/14 02:27 PM
To: Hylton Newcombe
Cc:
Subject: Objections Plan 8 Windfarm

Message attachments: 11001_LT1_VF.pdf, Turbine_letter.doc

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.

We feel that there are better places to erect these windfarms away from beautiful game and farm land, closer to industrial sites such as the Coega IDZ where there is already one turbine. 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.

Attached find a few letters of our clients that have responded to us with their feelings with regards to the Plan 8 Windfarm. We sincerely hope this plan will not be executed.

With kind regards,

Murray Crous
Petra Schutrops
Bushmans Gorge Lodge

Murray: + 27 (0)83 446 8256
Petra: + 27 (0)72 048 8496

www.bushmansgorge.co.za
bushmansgorge@hotmail.com

Murray Crous
Connect to social networks to show profile photos and activity updates of your colleagues in Outlook. Click here to add networks.
There are no items to show in this view.

Taskbar: 12:13 PM 2012/01/13



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

<u>Your letter</u>	<u>Our sign</u>	<u>Person</u>	<u>Svitavy, date</u>
	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



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

DRAFT

APPENDIX B-9: Attendance
Stakeholder engagement
Community Hall

register for
meeting – Coombs



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 HOCKLEY	Box 2273, GHT	0829232883			m.hockley@n1.co.za
Peter Klyki	Box 284	0828252684			pklyki@vodanail.co.za
O. Croes	Box 362	0826609944			e.chackelomss@yktod.com
D. Dixon	Box 6292	041-6224740			
L.S. Dixon	"	"			
P. Croes	Box 362	0834468256			bushmansgarage@
M. Croes	"	0720488496			hotmail.com
M. Ewee	Box 61	0823007730			
A. Sparrow	Box 506	0834060305			
F. Nortier	BOX 19	0795276335	046-622118	046-6361810	felicity@deklerk-devillers.co.za
M. Ewee	Box 621	0823007131			da
Marné Ewee	Box 621	0823007130			da

DRAFT



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
GERINNE DIXON	P.O. Box 292	046 622 7753		074 172 3239	gbd@geenet.co.za
GAVIN DIXON	P.O. Box 6292	"		"	"
KRIS PITTARD	P.O. Box 2225 GTN	046 692 3663		083 449 2462	valleyview@xsinet.co.za
GUREEN COETZEE	P.O. Box 2204 GTN	046 622 7812		082 808 5961	GMD@GEENET.CO.ZA
GAVIN DIXON	Box 6292 GTN	046 622 7753		081 478 4947 084 767 5097	gbd@geenet.co.za
Gdym Dixon	Box 6272 GTN	046 622 7776	0866 204 765	072 764 1303	claypits@geenet.co.za
Sue Dixon	"	"	"	082 290 1255	claypits@geenet.co.za

APPENDIX B-10: 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	gbd@geenet.co.za	POBox 6292 Grahamstown, Market Square 6141 (owns farm but does not reside there)
Morne and MardaErwee	Tower Hill Farm		0823007730 (Morne)		jmichau@zazu.co.za	Fairview farm, Koondesvalley, Grahamstown
Wayne Nortier	Peynes Kraal Farm	466 361 810	823193207 (Wayne) 0795274335 (Felicity)		waynenortier@gmail.com felicity@deklerk-devilliers.co.za	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	claypits@geenet.co.za	
OrgieCrous	Farmer - Honeykop No361	466228474	826609974	466228474	ebackloads@yahoo.com	PO BOX 362, Grahamstown, 6140
Jeremy Allan			827846805		jjrallan@yahoo.com	17 Milner strGrahamstown
Gilbert Coetzee	Coombesvale		828085961		gmd@geenet.co.za	POBOX 2204 Grahamstown 6140
James Williamson	Glenvoid		824412055		james@geenet.co.za	45 Kingsview Estate Miles rd Grahamstown
Andre Coetzee			826592710		no email address	POBOX 267 GHT
Fred Pittaway	Valleyview and Kaasvlei (sp.?)	466223663	834792762		valleyview@xsinet.co.za	POBOX 2225 GHT
GcobaniDyanty	Outspan Farm		826378632		amangwevu@yahoo.com	262B Grahamstown
<i>Government</i>						
Mr BriantNoncembu	DEDEA (Amathole)				Briant.Noncembu@deaet.ecape.gov.za	Private Bag X5029 Mthatha 5099
Carin Swart	DEDEA				Carin.Swart@deaet.ecape.gov.za	
Dan Malgas	DAFF Forestry				MalgasM@daff.gov.za	
S. Gwen	DAFF Forestry	(043) 604 5301			gwendolines@daff.gov.za	
AnnelizaCollett	DAFF Agri				annelizac@nda.agric.za	
M Mathekgana	Dept of Energy	(012) 444-4261			mokgadi.mathekgana@energy.gov.za	
Ms NyikoNkosi	DEA				nkosi@environment.gov.za	Private Bag X447, Pretoria, 0001
<i>Municipality</i>						
NtonekNocweka	Makana Municipality		072 8195472		ntontela@makana.gov.za	
AneleKwayimani	Makana Municipality	046 622 9186	083 6955 406	046 603 6062	anele.kwayimani@webmail.co.za	
XhanliBokue	Makana Municipality		083 335 4843		bokwe@makana.gov.za	
Casa Yonela	Makana Municipality		072 13302 92		casayo@webmail.co.za	
MzomhleRadu					radu@makana.gov.za	
<i>Key Stakeholders</i>						
NannaGouws	SANRAL				GouwsJ@nra.co.za	
MariagraziaGalamberti	SAHRA				mgalimberti@sahra.org.za	
XolaniWana	ESKOM				Xolani.Wana@eskom.co.za	
Lizelle Stroh	SACAA				strohl@caa.co.za	
Irene de Moor	WESSA				irenedemoor@imagnet.co.za	
Jenny Gon	WESSA				j-gon@intekom.co.za	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			p.mini@grocotts.co.za	40 High St, Grahamstown
Rob Cooper		466 225 753	827471888		rob@terrapower.co.za	PO Box 73, Grahamstown

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 m³ 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