

**ENVIRONMENTAL IMPACT ASSESSMENT:
PROPOSED WIND ENERGY FACILITY NEAR COPPERTON,
NORTHERN CAPE
DEA REF. NO. 12/12/20/2099**



NOVEMBER 2010



BACKGROUND INFORMATION DOCUMENT

Plan 8 (Pty) Ltd (Plan 8) proposes to construct a phased wind energy facility to generate approximately 200 Megawatts (MW) on a farm, near Copperton in the Northern Cape. Aurecon South Africa (Pty) Ltd (Aurecon) has been appointed to undertake the requisite environmental process as required in terms of the National Environmental Management Act (No. 107 of 1998), as amended, on behalf of Plan 8.

Purpose of this document

The purpose of this Background Information Document (BID) is to provide stakeholders with the opportunity to register as interested and affected parties (I&APs) in the Environmental Impact Assessment (EIA) process and to obtain their initial comments on the proposed wind energy facility near Copperton, Northern Cape.

The purpose of the EIA process is to identify and evaluate feasible alternatives and potential impacts, and to identify potential measures to avoid or reduce negative impacts and enhance positive impacts. The EIA decision-making authority is the Department of Environmental Affairs (DEA) in accordance with the National Environmental Management Act (No. 107 of 1998).

Please review this BID and submit your comments on the proposed project by **Tuesday, 21 January 2011**. To comment, write a letter, call or e-mail the Public Participation office. All EIA documents will be available on the Aurecon (Pty) Ltd (Aurecon) website (www.aurecongroup.com follow the public participation links)

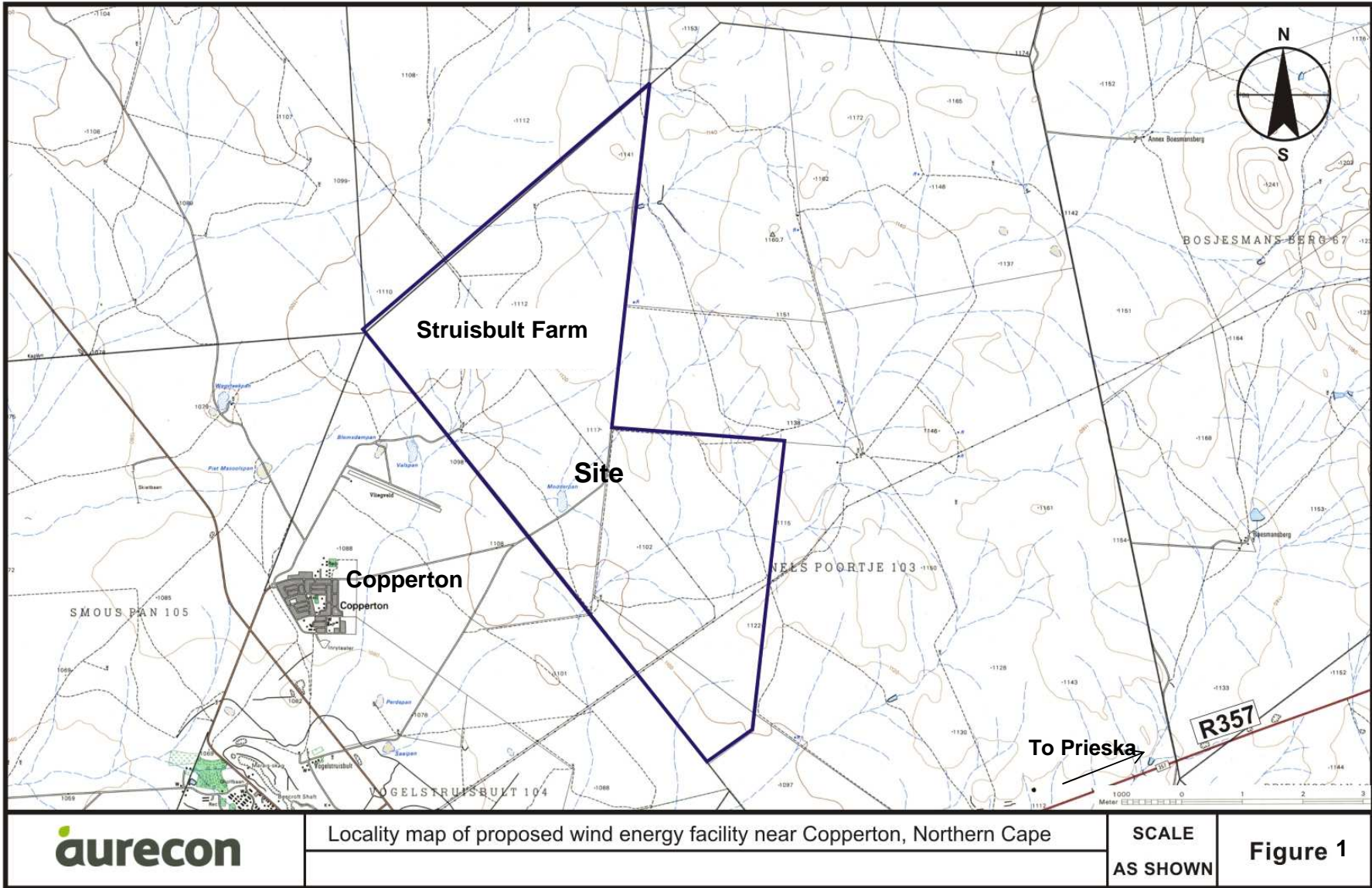
Proposed Project and Location

The proposed project would consist of three phases, which would take place over a number of years dependent on Eskom's timelines for purchase of the energy, as follows:

Phase	No. of turbines (approximate)	MW	Cumulative MW
1	20	50	50
2	20	50	100
3	50	100	200

Each turbine would generate approximately 2.5 MW. There is electricity distribution infrastructure adjacent to the farm which is designed for 132 kilovolt distribution. This line could be used by the proposed project to evacuate the power generated and hence a new line, other than the existing 2 km long connection, would not be required. However, Eskom may require that the electricity is evacuated via the Cupum substation, which is located on the site of the disused Copper mine rock crushing facility approximately 6.5 km away. The final connection will be dependent on the technical requirements and cost set out by Eskom.

The proposed project would take place on Struisbult Farm (Farm No. 103 Portions 4 and 7), near Copperton in the Northern Cape (see **Figure 1**). Struisbult Farm is located approximately 5 km east of Copperton and the two portions cover 3 000 ha.



The major landuse in the larger area consists of cattle and sheep farming (both of which take place on Struisbult Farm). Other crops and animals, such as olives and goats, are farmed to a lesser extent. The remnants of Copperton Mine, a zinc and copper mine which operated from 1973 to 1991, is located to the west of the site. Also to the west of the site is the Alkantpan weapons' testing facility, which is used by various weapon manufacturer's around the world. A lodge, Herberg Accomodation, which provides accommodation for the people making use of the weapons' testing facility, operates on Struisbult Farm (immediately west of the portions comprising the site).

Affected Environment

The site lies within the Bushmanland Arid Grassland vegetation type in the Nama-Karoo biome. This vegetation type is considered to be Least Threatened, although it is not well conserved (currently only 0.4 % is protected). Bushmanland Arid Grassland occurs on extensive, relatively flat plains and is sparsely vegetated by tussock grasses, including *Stipagrostis ciliata*, *Aristida adscensionis*, *Aristida congesta*, *Enneapogon desvauxii*, *Eragrostis nindensis*, *Schmidtia kalahariensis* and *Stipagrostis obtuse*. There are no known endemics in this vegetation. In some years after good rains there is an abundance of annual herbs in the area¹.

The topography of the area is relatively flat, although a few ridges are present in the landscape and these offer some visual screening to anthropogenic elements such as the remains of the copper mine at Copperton.

The Northern Cape experiences typical semi-desert and desert climatic conditions. The summers are hot and dry and the winters cold and frosty. Records from the nearest weather station at Upington (196 km north east of Copperton) show an average daily maximum of 36°C in summer (January) and an average daily minimum of 4°C in winter (July). The average annual rainfall is 189 mm, with the most rain falling in March².

Fauna observed in the area during November 2010 include Springbok, Meerkat and Black-backed Jackal. Avifauna observed include the Sociable Weaver, Pale-chanting Goshawk, Black Korhaan, South African Shelduck, Redcapped Lark and Pied Crow. Other species likely to occur in the area include Aardvark, Bat-eared Fox and Slender Mongoose.

What is a wind turbine?

A wind turbine is a rotary device that extracts energy from the wind. If the mechanical energy is used directly by machinery, such as for pumping water, cutting lumber or grinding stones, the machine is called a windmill. If the mechanical energy is instead converted to electricity, the machine is called a wind turbine.

Wind turbines can rotate about either a horizontal or a vertical axis. Turbines used in wind farms for commercial production of electricity are usually horizontal axis, three-bladed and pointed into the wind by computer-controlled motors. These have high tip speeds of over 320 km/hour, high efficiency, and low torque ripple, which contribute to good reliability. The blades are usually colored light gray and range in length from 20 - 50 m or more. The tubular steel towers range from 60 - 100 m tall. The blades rotate at 10 - 22 revolutions per minute. A gear box is commonly used for stepping up the speed of the generator. Some models operate at constant speed, but more energy can be collected by variable-speed turbines. All turbines are equipped with protective features to avoid damage at high wind speeds, by feathering (turning) the blades into the wind which ceases their rotation, supplemented by brakes.

Horizontal axis wind turbines have the main rotor shaft and electrical generator at the top of a tower in a nacelle. Conventional horizontal axis turbines can be divided into three components.

¹ Mucina, L. and Rutherford, M.C.(eds). 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

² <http://196.25.43.195/Climat/Climstats/UpingtonStats.jsp> (accessed, 17/11/10)

- The rotor component, which includes the blades for converting wind energy to low speed rotational energy.
- The generator component, which includes the electrical generator, the control electronics, and most likely a gearbox component for converting the low speed incoming rotation to high speed rotation suitable for generating electricity.
- The structural support component, which includes the tower and rotor yaw mechanism (which turns the rotor into the wind).

(source http://en.wikipedia.org/wiki/Wind_turbine (accessed 15/11/2010))

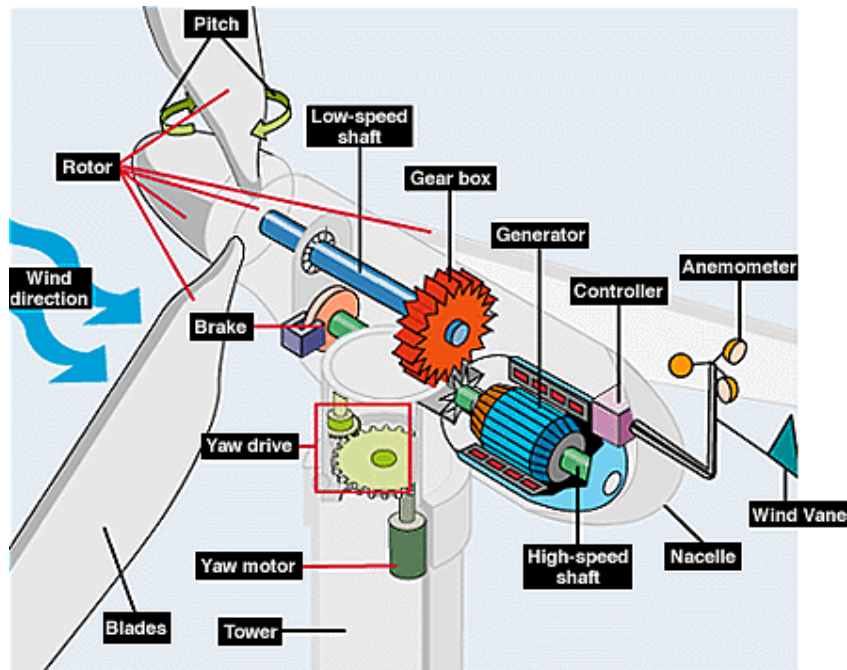


Figure 2 Typical components of a horizontal axis wind turbine
(source http://www1.eere.energy.gov/windandhydro/images/illust_large_turbine.gif)



Figure 3 Wind turbine in the process of erection (source <http://www.windpowerninja.com/wind-power-government-industry-news/massive-opportunity-for-wind-turbine-production-in-us-66460/>)



Figure 4 Small wind farm near Caen, France

(source http://commons.wikimedia.org/wiki/File:%C3%89oliennes_Caen.jpg)

The final foundation design of turbines is dependent on geotechnical investigation, however it is likely that for the proposed project foundations would be made of reinforced concrete. The foundations would be approximately 20 m x 20 m and an average of 3 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.

A hardstanding for a crane made of an impermeable material such as concrete or tar and approximately 20 m x 6 m, would be constructed adjacent to each turbine. Access roads of 6 m we would also be required between each turbine.

Legal Requirements

Environmental Impact Assessment (EIA) Regulations (Regulations 544, 545 and 546) promulgated in terms of the National Environmental Management Act (NEMA) (No. 107 of 1998) (amended), identify certain activities, which “*could have a substantial detrimental effect on the environment*”. These listed activities require environmental authorisation from the competent environmental authority, i.e. the Department of Environmental Affairs (DEA), prior to commencing.

This proposed project triggers a number of listed activities in terms of NEMA and accordingly requires environmental authorisation from DEA. The activities listed in terms of NEMA, Government Notice (GN) No. 544, 545 and 546, June 2010 are as follows:

GN No. The construction of facilities or infrastructure for the transmission and distribution of electricity -
 544: 10 i. outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or
 ii. inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.

GN No. The construction of facilities or infrastructure for the generation of electricity where the electricity
 545: 1 output is 20 megawatts or more.

Accordingly, the proposed project will require the submission of a Scoping Report and an EIA Report (EIAR) as outlined in Sections 28 and 31 of Regulation 543.

Aurecon, as an independent consultant, has been appointed to undertake the required EIA process on Plan 8's behalf.

EIA Process

The EIA process consists of an Initial Phase, a Scoping Phase and an EIA Phase (see **Figure 5**). The purpose of the Scoping Phase is to identify and describe potential positive and negative environmental impacts, (both social and biophysical), associated with the proposed project and to screen feasible alternatives which will be considered in further detail in the EIA Phase.

The purpose of the EIA Phase is to comprehensively investigate and assess those alternatives and impacts identified in the Scoping Phase.

The approval of the Scoping Report and the Plan of Study for EIA at the end of the Scoping Phase by DEA would allow the process to continue to the EIA Phase.

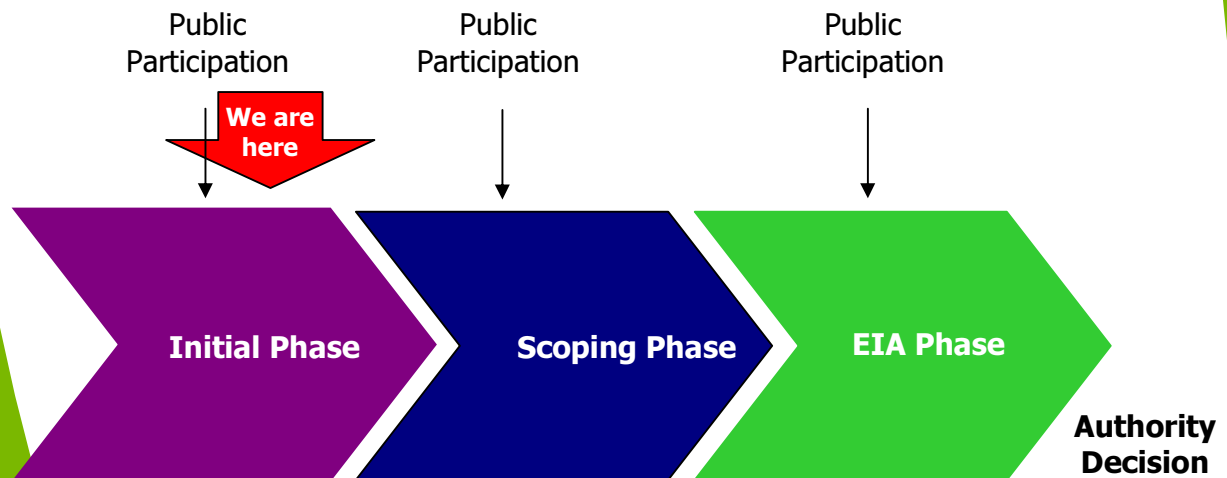


Figure 5 The EIA process

Potential environmental impacts associated with the proposed project

A number of potential positive and negative impacts on the biophysical and socio-economic environment, which could result from the proposed project, have been identified. These include:

- Bio-physical:
 - Impact on avifauna (birds);
 - Impact on fauna;
 - Impact on flora;
- Socio-economic
 - Impact on local economics (employment);
 - Impact on social conditions;
 - Impact on heritage resources (including palaeontology);
 - Impact on visual aesthetics;
 - Impact on energy production;
 - Impact of loss of agricultural land; and
 - Impact on surrounding land uses.

These potential impacts will be considered in further detail in the Scoping Phase and it will be determined whether additional, specialist information is required in order to assess the potential impacts in the EIA Phase.

How You Can Get Involved

You have been identified as a potential Interested and/ or Affected Party (I&AP) for this project, either because you represent an affected organisation or because of your proximity/location to the proposed project. Public participation is a key component of this environmental process and will take place at various stages throughout the project. This process will include the following steps:

- Advertising the project in newspapers (Volksblad);
- Distributing this BID to all identified stakeholders;
- Lodging of the Draft Scoping Report in the Prieska (Elizabeth Vermeulen) Library and on the Aurecon website (www.aurecongroup.com) and informing the public regarding the availability of the Draft Scoping Report for a 40 day comment period during which the public has the opportunity to review the draft document and raise any issues or concerns;
- Finalising the Scoping Report, taking cognisance of comments received from I&APs, key stakeholders and relevant organs of state;
- Lodging the Final Scoping Report in the Prieska (Elizabeth Vermeulen) Library and on the Aurecon website for a 21 day comment period;
- Inviting all I&APs to comment on the report via letters and/ or e-mail;
- Lodging of the Draft EIAR in the Prieska (Elizabeth Vermeulen) Library and on the Aurecon website and informing the public regarding the availability of the Draft EIAR for a 40 day comment period during which the public has the opportunity to review the draft document and raise any issues or concerns;
- Finalising the EIAR, taking cognisance of comments received from I&APs, key stakeholders and relevant organs of state;
- Lodging the Final EIAR in the Prieska (Elizabeth Vermeulen) Library and on the Aurecon website for a 21 day comment period;
- Submitting the Final EIAR to DEA to inform their decision about the proposed project; and
- Advertising the Environmental Authorisation received from DEA and the opportunity for appeal.

All written correspondence will be in English and Afrikaans. Note that this excludes reports.

Your responsibilities as an I&AP

According to Regulation No. 543, Section 56 the responsibility of an I&AP are as follows:

- a) Comments must be submitted within the approved timeframes or within any extension of a timeframe agreed to by the applicant or EAP;
- b) A copy of any comments submitted directly to the Department of Environmental Affairs must be submitted to the EAP; and
- c) Any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.

Way Forward

Following the completion of the Draft Scoping Report, it will be lodged in the Prieska (Elizabeth Vermeulen) Library and on the Aurecon website. Registered I&APs will be notified of the lodging and given a 40 day opportunity in which to comment on the report.

Should you wish to raise any initial issues or concerns regarding the proposed project, or if you wish to register as an I&AP, please contact the Public Participation Office at the details below by **21 January 2011**.

List of Acronyms

BID	Background Information Document
DEA	Department of Environmental Affairs
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
GN	Government Notice
I&AP	Interested and Affected Party
MW	Megawatts
NEMA	National Environmental Management Act

Public Participation Office

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