DRAFT SCOPING REPORT : EXECUTIVE SUMMARY (ENGLISH)

COMBINED ENVIRONMENTAL IMPACT ASSESSMENT FOR THE UMSINDE EMOYENI WIND ENERGY FACILITY PHASE 1 & 2 AND ASSOCIATED ELECTRICAL GRID CONNECTION PHASE 1 & 2 WESTERN CAPE & NORTHERN CAPE

DEA REF: 14/12/16/3/3/2/687
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On behalf of

Emoyeni Wind Farm Project Proprietary Limited

JUNE 2014

EXECUTIVE SUMMARY

The report provides and executive summary to the Draft Scoping Report for the proposed Umsinde Emoyeni Wind Energy Facility (WEF), and associated infrastructure including grid connection infrastructure. The full Draft Scoping Report is available to view at the following locations:

- Murraysburg local municipal office;
- Murraysburg Farmers' Co-operative;
- Richmond police station, and library;
- Ubuntu local municipalities;
- Beaufort West local municipality offices; and
- www.eims.co.za.

The comment period for reviewing the Draft Scoping Report will be 40 days (2nd July 2014 to 11th August 2014).

1.1 Introduction

1.1.1 Background

Emoyeni Wind Farm Project Proprietary Limited (EWFP) are proposing the Umsinde Emoyeni Wind Energy Facility (WEF), and associated infrastructure including grid connection infrastructure, located near the town of Murraysburg in the Western Cape. A small portion of the Proposed Development Site extends into the Northern Cape Province.

There are four components to the Proposed Development, representing two development phases:

- Umsinde Emoyeni WEF: Phase 1;
- Electrical Grid Connection and Associated Infrastructure for Umsinde Emoyeni WEF Phase 1;
- Umsinde Emoyeni WEF: Phase 2; and
- Electrical Grid Connection and Associated Infrastructure for Umsinde Emoyeni WEF Phase 2.

Each WEF development phase will comprise up to 98 wind turbines (each with an installed generation capacity of between 1.5 and 3.5 megawatts (MW) and a maximum height to blade tip of 180 m) and associated ancillary infrastructure including access tracks, hardstanding and laydown areas, anemometer masts, onsite cabling and office compound.

In addition to the WEFs, EWFP also proposes Transmission and Distribution Grid Connection Infrastructure for the required grid connection. The grid connection infrastructure will be routed from a start location within the WEF Site Boundary to the existing National Grid.

A number of activities associated with the Proposed Development, as set out in the Scoping Report, require Environmental Authorisation from the Department of Environmental Affairs (DEA) under the Environmental Impact Assessment (EIA) Regulations (Government Notice R.543 in Government Gazette 33306 of 18 June 2010)[1], which were introduced through Chapter 5 of the National Environmental Management Act (Act No. 107 of 1998) (NEMA)[2].

[1] Environmental Impact Assessment Regulations. Available online: http://www.environment.co.za/environmental-laws-and-legislation-in-south-africa/eia-environmental-impact-assessment-regulations-law-south-africa.html Accessed 17/06/2014.
[2] National Environmental Management Act. Available online: http://www.environment.co.za/environmental-laws-and-legislation-in-south-africa/nema-south-africa-national-environmental-management-act-legislation-and-environmental-acts.html Accessed 17/06/2014.

1.1.2 Proposed Development Site

The Proposed Development Site occupies hilly terrain with ephemeral and seasonal drainage features. The altitude varies between 1200 m and 1900 m above mean sea level from west to east with the geology dominated by mudstone, shale and sandstone with numerous dolerite intrusions. The majority of the site is characterised by a land use dominated by extensive sheep grazing with small occurrences, generally to the south, of crop production in alluvial deposits in drainage features. The soils are generally shallow and the annual rainfall is low (approximately 300 mm per annum) and erratic.

The Proposed Development Site covers a total area of approximately 93,000 hectares, of which only a small proportion will be occupied by the final Proposed Development footprint.

1.1.3 Project Proponents

EWFP is a Special Purpose Vehicle (SPV) established under Windlab Developments South Africa (Pty) Ltd (WDSA), which is a wholly-owned subsidiary of Windlab Systems (Pty) Ltd (Windlab). The project will be submitted to the Department of Energy through the Renewable Energy Independent Power Producers Programme (REIPPPP). In accordance with the REIPPPP bid requirements, WDSA have established EWFP to obtain the Environmental Authorisation and preferred bidder status for each of the proposed two phases of the Proposed Development. The project will apply for an operationa lifespan of 20 years through the REIPPPP.

Windlab is an international wind energy development company which was established in 2003 through the commercialisation of wind mapping technology developed by Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO). Making use of wind mapping technology, Windlab is able to successfully identify, secure and develop commercial wind farm sites with a growing project portfolio of over 6,500 MW in varying stages of development and implementation with projects in Canada, the United States of America, Australia, New Zealand and South Africa.

1.1.4 The EIA Project Team

Arcus Consultancy Services Ltd (Arcus) have been appointed to undertake the environmental impact assessment (EIA) process, incorporating both the scoping and EIA phase, for the Proposed Development. The scoping and EIA process will be conducted through a combined exercise for all four components of the Proposed Development. Each component is subject to a separate application for Environmental Authorisation to the DEA.

The coordination and management of the EIA process is being managed by lead EAP Jennifer Slack who has assembled a team of technical specialists for undertaking the scoping and EIA of the potential impacts of the Proposed Development, as outlined in Table 1.

Table 1. EIA Project Team

Name	Organisation	Role / Specialist Study
Jennifer Slack	Arcus Consulting	Project Leader (EAPSA)
Liam Whitlow and Nobuhle Hughes	EIMS	Public Participation Coordination and Management of I&AP process.
Andrew Pearson and Mike Armitage	Arcus Consulting	Bird Impact Assessment and Monitoring
Kate McEwan	NSS Environmental	Bat Impact Assessment and Monitoring
Dr Jane Turpie and	Anchor Environmental	Terrestrial Ecological Impact

Name	Organisation	Role / Specialist Study
Simon Todd		Assessment (Flora and Fauna)
Dr Tim Hart	ACO Associates	Heritage Impact Assessment
Dr Almond	via ACO Associates	Palaeontology Assessment
Dr Brian Colloty	Scherman Colloty and Associates	Aquatic/ Wetland Assessment
Mome de Jager	Enviro-Acoustic Research	Noise Impact Assessment
Bernard Oberholzer	Bernard Oberholzer Landscape Architects	Visual Assessment
Quinton Lawson	Meirelles Lawson Burger Architects	
Dr JH van der Waals	Terrasoils	Soil and Agriculture
Tony Barbour	Tony Barbour Environmental Consulting and Research	Social Impact Assessment

1.2 Need for the Development

Wind energy facilities can play a role in mitigating or reducing climate change, addressing South Africa's energy resource constraints and producing low-cost energy. In addition, operating wind energy facilities in South Africa provides the potential to invest in the economic development of the areas in which they are located.

The Proposed Development, in combination with other WEFs, have the potential to assist South Africa to meet its development goals while meeting its carbon emission reduction targets as per international protocols.

1.2.1 Climate Change

The scientific consensus on climate change is that climate is changing and that these changes are in large part caused by human activities[3]. Of these human activities, increase in carbon dioxide (CO_2) levels due to emissions from fossil fuel combustion is regarded as a significant contributor to anthropogenic climate change.

South Africa is one of the world's largest emitters of CO_2 in absolute and per capita terms. As explained in National Treasury's Carbon Tax Policy Paper (May, 2013)[4], addressing the challenges of climate change through facilitating a viable and fair transition to a low-carbon economy is essential to ensure an environmentally sustainable economic development and growth path for South Africa.

Under the Copenhagen Accord[5], South Africa pledged in 2009 to ensure that its greenhouse gas emissions are lower than the business-as-usual growth trajectory by around 34 per cent by 2020 and 42 per cent by 2025 and renewable energy projects will play a significant role in assisting the transition to a low-carbon economy.

1.2.2 Energy Constraints

South Africa faces major energy constraints with demand exceeding planned supply. To ensure that South Africa's economy can continue to grow, the energy constraints can be addressed by constructing additional electricity generators and WEFs in particular have a relatively short construction period, meaning that much-needed power can be added to the grid much quicker other conventional generation technologies of the same scale.

[3] http://adsabs.harvard.edu/abs/2013ERL.....8b4024C (accessed 18th June 2014)
[4] National Treasury Carbon Tax Policy Paper. Available online http://www.treasury.gov.za/public%20comments/Carbon%20Tax%20Policy%20Paper%202013.pdf (Accessed 19th June 2014)
[5] Copenhagen Accord https://unfccc.int/meetings/copenhagen_dec_2009/items/5262.php (Accessed 20th June 2014).

1.2.3 Diversification and Decentralisation of Supply

With its abundant coal supplies, approximately 92.6% of South Africa's energy needs are currently met through coal-fired generators, with nuclear energy contributing 5.7% and the balance by pumped storage (1.2%), hydroelectric (0.5%) and gas turbines (0.1%). Electricity generation is dominated by state-owned power company Eskom, which currently produces over 96.7% of the power used in the country[6].

A diversification of energy supplies, particularly with respect to renewable energy sources, would lead to greater energy security and economic and environmental benefits. The deployment of various renewable technologies increases the diversity of electricity sources and, through local decentralised generation, contributes to the flexibility of the system.

1.2.4 Cost

In terms of cost, wind energy is globally one of the cheapest forms of new generation capacity available[7]. With Eskom currently producing power at 60c/kWh, and electricity from the coal-fired power stations currently under construction expected to cost more than 97c/kWh, wind energy, at a cost of 66.4c/kWh, is one of the lowest cost forms of new generation capacity in South Africa.

In addition to the cost of developing, financing, constructing, operating and decommissioning energy generating facilities, all energy generators produce an external cost such as the additional indirect costs incurred by society and the environment, including health, climate change, environmental, mining and water costs. WEFs produce relatively small external costs when compared to other energy generation technologies.

1.2.5 Economic Development

The Proposed Development will create both skilled and unskilled jobs, particularly during the construction period is a rural location with small communities and limited infrastructure and social amenities. Indirect jobs would also be created in accommodation, catering and other services that would be required to support the Proposed Development.

Large scale development of WEFs in South Africa can lead to the construction of new manufacturing facilities to build wind turbine towers and other turbine components to support the industry. Wind energy can improve the technical skills profile of the country and the regions where wind energy facilities are located. Through the REIPPPP, developers' own initiatives and through support from international donor agencies, a number of young South Africans are being trained on various aspects of WEF construction and operation.

The communities surrounding WEFs are required to have an equity stake in the project; the communities are beneficiaries of the dividends paid to shareholders with the dividend revenue invested in community development initiatives. There is a requirement to invest a percentage of gross revenue in socio economic development and enterprise development, and as such a number of critical infrastructure and social programmes could be developed to support and enrich the areas in which the WEFs are installed.

[6] http://www.usea.org/sites/default/files/event-file/497/South_Africa_Country_Presentation.pdf (accessed 18th June 2014)

[7] https://about.bnef.com/press-releases/renewable-energy-now-cheaper-than-new-fossil-fuels-in-australia/
http://www.bloomberg.com/news/2013-02-06/australia-wind-energy-cheaper-than-coal-natural-gas-bnef-says.html
http://www.eia.gov/forecasts/aeo/electricity_generation.cfm

1.3 The Environmental Impact Assessment Process

1.3.1 Environmental Impact Assessment

EIA is ultimately a decision-making process with the specific aim of selecting an option that will provide an appropriate balance between benefits and (adverse) impacts. The EIA process should identify activities which may have a detrimental effect on the environment, and which would therefore require environmental authorisation prior to commencement.

1.3.2 Scoping Report

The scoping phase of the EIA process refers to the process, by consultation with Interested and Affected Parties (I&APs), of determining the extent of the EIA, including the potential impacts that should be assessed and the survey and assessment methods that should be followed.

This Draft Scoping Report introduces the Proposed Development including the assessment of alternatives and the need for alternatives. It introduces the project proponents and the EAP and EIA Specialists. It provides a legal context, in terms of EIA requirements, and a planning and policy context for the Proposed Development as a Renewable Energy development, and provides an overview of baseline environments, predicted impacts, key stakeholders and proposed EIA assessment methods for the Plan of Study for EIA (PSEIA).

Environmental surveys have started and where possible this survey information has been included in this Draft Scoping Report which is being made available for public and stakeholder comment for a prescribed consultation period of 40 days. All comments received in response to the Draft Scoping Report will be incorporated into a Final Scoping Report and PSEIA, which will then submitted to the DEA, as the competent authority, for approval to mark the end of the Scoping phase. I&APs are then able to comment on the Final Scoping Report and PSEIA by submitting their comments directly to the DEA.

1.3.3 EIA Report

After Scoping, the EAP will compile the Draft EIA Report (DEIAR) which will then, like the Draft Scoping Report, be made available for public and stakeholder comment for a period of 40 days. Any comments will then be considered and incorporated as applicable into a Final EIA Report (FEIAR). I&APs are then notified of the availability of the FEIAR and advised that should they like to comment on the report, they must submit their comments directly to the DEA.

The EIA Reports will assess the potential impacts of the Proposed Development on the existing baseline environment. This will include an assessment of cumulative impacts between the components of the Proposed Development, and also other developments in the area such as the neighbouring Ishwati Emoyeni WEF.

Once a FEIAR has been submitted to the DEA they will make a decision on whether or not to grant or refuse Environmental Authorisation.

1.3.4 Consultation and Availability of Information

All I&APs are invited to provide comments on the Scoping Report and EIA Report at the appropriate time. All comments received will be considered in the EIA process.

To ensure ongoing access to information, copies of the Scoping Report and EIA Report will be placed at the Murraysburg local municipal office and Farmers' Co-operative, the Richmond police station and library, the Ubuntu and Beaufort West local municipalities and online at www.eims.co.za.

1.4 Project Description

1.4.1 WEF Components

The WEF will comprise components described below. It should be noted as the design of the Proposed Development is not yet finalised, all dimensions are maximums as is required by the EIA process. The final design may include infrastructure of equal or less than the dimensions to those stated below, but not more.

1.4.1.1 Wind Turbines

Each phase of the WEF will comprise up to 98 turbines, each with a capacity to generate between 1.5 and 3.5 MW of power. The turbines will be a three-bladed horizontal-axis design and will have a maximum height to blade tip of 180 m, with a hub height of up to 120 m and a rotor diameter of up to 130 m.

Each turbine will require a transformer and, depending on the selected model of turbine, this will be either located within the turbine tower or adjacent to the turbine on a concrete plinth.

The turbines will be placed on steel and concrete foundations which will each occupy an area of up to 30 m by 30 m in total (which includes the maximum total area that may need to be disturbed during construction of the foundation), and be typically up to 3 m deep and may include concrete and steel plinths depending upon local ground conditions.

1.4.1.2 Hardstanding Areas

A hardstanding area of up to 45 m by 25 m will be established adjacent to each turbine location. This will be used to provide a platform for cranes to operate during construction (and maintenance), as well as a clear area to lay out turbine components prior to erection.

1.4.1.3 Laydown Areas

Up to three additional temporary laydown areas of up to 150 m by 60 m in size will be required for equipment and component storage during construction. These areas will be levelled and compacted and used for temporary component storage.

1.4.1.4 Electrical Cabling and Onsite Substation

The electricity from the turbines will be transferred via a 33 kV electrical network to a 33/ 132 kV onsite substation. Where possible this will be underground but the feasibility of this will be confirmed as the design progresses. The onsite substation will house electrical infrastructure such as transformers and switch gear to enable the energy to be transferred into the existing National Grid.

1.4.1.5 Access

The turbine locations will be accessed through a network of unsealed tracks which will be established across the WEF Site. These access tracks will be up to 9 m wide during construction, depending on local topography, but will be reduced to between 3 m and 4 m during operation. Such roads are required to facilitate access for the cranes and abnormal load deliveries of turbine components.

Existing farm access tracks will be upgraded and utilised where possible, as will existing watercourse crossings. Some of the aggregate required for the construction of the onsite tracks may be sourced from borrow pits within the Proposed Development Site with additional material imported as required.

1.4.1.6 Compound

There will be an onsite office compound, including parking area and an operation and maintenance facility, including a control room.

1.4.1.7 Ancillary Equipment

In addition to the key components outlined above, the WEF will also require:

- Anemometer masts;
- Security fencing; and
- CCTV monitoring towers.

1.4.2 Grid Connection

The electricity generated from the WEF will need to be transferred from the onsite substation to the existing National Grid. Eskom has an existing grid network in the area and it is proposed that the electricity will be transferred to the existing Eskom Gamma substation via a system of 132 kV overhead power lines. From the Gamma substation the energy will be transferred via a new short section of power line to the existing high-voltage lines of the National Grid.

The type of structures which will support the overhead lines is yet to be determined as is the exact route of the power lines. However, the grid connection infrastructure for the two Phases of the WEF will follow the same route to the Gamma substation if both Phases are successfully approved.

At the Eskom Gamma substation the distribution overhead lines will connect into a newly constructed 400/132 kV substation yard which will include transformers and switch gear required to connect the energy into the existing National Grid network.

It is possible that if the adjacent Ishwati Emoyeni WEF (DEA Application Reference: 12/12/20/2351) is authorised and successful within the REIPPPP in advance of or at the same time as Umsinde Emoyeni, the preferred point of the grid connection may be on the Ishwati Emoyeni site (not at the Gamma substation). This would reduce the length of the power lines required to connect Umsinde Emoyeni to the National Grid and thus is likely to reduce any environmental impacts.

1.4.3 Construction Phase

It is estimated that construction will take approximately 18 – 24 months subject to the final design of the scheme, weather and ground conditions, including time for testing and commissioning. Construction activities will be carried out in order to minimise the overall length of the construction programme.

Based on experience from other WEFs, the construction phase is likely to create approximately 300 employment opportunities; approximately 25% will be skilled, 15% semi-skilled and 60% low-skilled personnel.

1.4.4 Operational Phase

During operation of the Development, the large majority of the WEF Site will continue in agricultural use as it is currently. The only Development related activities on-site will be routine servicing and unscheduled maintenance.

Based on experience from other WEFs the operational phase is likely to create approximately 75 permanent employment opportunities; approximately 80% will be low and medium-skilled and 20% will be high skilled positions.

1.4.5 Decommissioning Phase

At the end of the operation phase, the Proposed Development will be decommissioned, or may be repowered, i.e., redesigned and refitted so as to operate for a longer period. Repowering would not be undertaken under this application or resulting Environmental Authorisation, and would be subject to a new application at the time. In the event of decommissioning, typically, all above ground equipment will be dismantled and removed from the site. Cables and the turbine foundations will be cut off below ground level and covered with topsoil. Access tracks will be left for use by the landowners, or if appropriate, covered with topsoil or reduced in width. This approach is considered to be best practice environmentally and less damaging than seeking to remove all foundations, underground cables in their entirety.

1.5 Identification of Potential Impacts

Each of the specialist assessments (visual, terrestrial ecology, bats, wetlands and freshwater, avifauna, soils and agriculture, cultural heritage, archaeology and palaeontology, noise and social) will follow a systematic approach to the identification and assessment of impacts, with the principal steps being:

- Description of existing environment/baseline conditions;
- Prediction of likely potential impacts, including cumulative impacts (both positive and negative);
- Assessment of likely potential impacts (positive and negative);
- Identification of appropriate mitigation measures; and
- Assessment of residual (potential) environmental impacts.

The individual baseline descriptions and assessment methodologies are set out in Chapters 4-12 of the scoping report. The approaches are in line with legal requirements and industry guidelines and will make use of the considerable experience and expertise of the EAP and the specialists.

1.5.1 Visual

The baseline conditions of the visual and landscape environment have been established via consideration of a study area. The study area includes all land falling within the Proposed Development boundary and the immediately surrounding area, up to 15 km from the boundary.

The following baseline methodology was employed:

- Mapping of the study area and its landscape context;
- Mapping of the projected viewsheds and distance radii of the Proposed Development to determine the possible zone of visual influence;
- Identification of important viewpoints and view corridors;
- A photographic survey from selected viewpoints, taking into account possible sensitive receptors;
- Identification of landscape characteristics, including topographical and geological features, vegetation cover, land use, cultural landscapes and cultivated lands, settlements and farmsteads;
- Identification and mapping of visual/ landscape constraints, including buffers, for the proposed WEF and grid connection infrastructure, with an indication of significance and overall sensitivity;
- Formulation of possible design considerations; mitigation measures and recommendations to minimise potential adverse visual impacts.

Based on the baseline characteristics of the Proposed Development Site, as well as the experience of the specialists, potential landscape and visual impacts have been identified as:

- Visual intrusion of the wind turbines on the skyline as viewed by receptors;
- Visual intrusion of the associated infrastructure creating an industrial landscape;
- Visual disturbance caused by the flicker-effect (shadow flicker);
- Visual intrusion of the red safety aviation lights on the Karoo night sky; and
- Intrusion of industrial machinery in the landscape.

The Proposed Development has the potential to cause landscape and visual impacts on the landscape character of the Karoo, local residents, visitors to the area, and commuters using local transport routes.

1.5.2 Terrestrial Ecology (Flora and Fauna)

The terrestrial ecology baseline was established using local, national and international data sources and literature, in conjunction with a site visit to:

- Gain a broad understanding of the site, in terms of the distribution of vegetation and habitats;
- Understand the broad characteristics of the site;
- Focus on the areas likely to represent key areas for development at the site; and
- Characterise potentially sensitive areas that may need to be avoided.

In addition, where specialised or sensitive habitats were encountered, these were investigated for the presence of species of conservation concern.

Simon Todd, the ecological specialist for the Proposed Development, performed the ecological assessment for the neighbouring Ishwati Emoyeni WEF which shares a development location which overlaps with the Grid Connection Site and hence has a good knowledge of the ecology in this locality.

Based on the baseline characteristics of the Proposed Development Site, as well as the experience of the specialists, potential ecological impacts have been identified as:

- Impacts on vegetation and protected plant species;
- Alien plant invasion risk;
- Increased soil erosion risk;
- Faunal impacts:
    - Illegal collection or poaching of certain species (during construction); and
    - Indirect impacts resulting from noise (construction and decommissioning activities, and from wind turbines during the operation phase) as well as human presence, which may deter shy species as well as disrupt ecological connectivity for species.

1.5.3 Bats

The baseline environment was established via a desk study and site surveys. A desktop review of literature, legislation and the Likelihood of Occurrence of specific species has commenced. Surveys of the WEF Site have commenced and will be carried out between mid-July 2013 and mid-July 2014, with the aim of achieving bat acoustic monitoring for a minimum of 75% of the year over the monitoring stations. This Draft Scoping Report includes information obtained from 8 months of monitoring, for the period mid-July 2013 to mid-March 2014.

With regard to the Grid Connection Site, a site visit will be undertaken at the EIA phase in order to inform the design and layout. The aim will be to avoid area of high sensitivity to bats with regard to high value migratory corridors and habitats

Based on the baseline characteristics of the Proposed Development Site, as well as the experience of the specialists, potential bat impacts have been identified as:

- Roost disturbance and/ or destruction due to construction activities;

- Fragmentation to and displacement from foraging habitat due to wind turbine construction and operation through noise and dust disturbance and intersection of flight paths;
- Fatalities of Medium-High and High risk bat species due to collision or barotrauma during foraging activity or attraction to turbines;
- Fatalities of migrating species due to collision or barotrauma during migration;
- Roosting or foraging habitat disturbance due to overhead power line construction; and
- Bat fatalities due to collision with overhead power lines.

1.5.4 Wetlands and Freshwater

The baseline environment was established via a desktop assessment of the available information on aquatic systems found in the region, as well as other data sources. Following Scoping, a site visit will be carried out, and then a detailed specialist report will form part of the EIA.

Based on the baseline characteristics of the Proposed Development Site, as well as the experience of the specialists, potential hydrological impacts have been identified as:

- The potential loss of aquatic habitat (physical destruction);
- Loss of ecosystem services;
- Habitat fragmentation (fish support areas);
- Potential loss of Species of Special Concern (plants and fish); and
- Sedimentation and erosion.

Set-back distances will feed into the design process along with other recommendations for embedded mitigation including utilising existing roads with river / water crossings as far as possible so as to minimise the number of new crossings. Preliminary recommendations would be to utilise a 32 m set-back distance around all the delineated water courses / rivers (as far as possible) with wetlands receiving a 50 m set-back.

1.5.5 Avifauna

The baseline avifauna environment for the Proposed Development Site was defined utilising a desk based study plus site visits to the WEF Site. In total, as 12-month monitoring programme will be completed as part of the EIA. No site visit has yet been conducted at the Grid Connection Site and this will be completed during the EIA phase.

Based on the baseline characteristics of the Proposed Development Site, as well as the experience of the specialists, potential avifauna impacts have been identified as:

- Collision with turbines - a number of factors influence the number of birds impacted by collision, including: the number of birds in the vicinity of the WEF, the species of bird present (and their flying patterns and behaviour) and the design of the development, including the turbine layout and size;
- Electrocution from power lines – is caused when birds perch on electrical structures and cause an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components;
- Collision with power lines - in general, large lines with earth wires that are not always visible to birds can have the largest impact in terms of collisions. Most heavily impacted upon are species with heavy-bodies and limited manoeuvrability, many of which are considered threatened in southern Africa and are long living and slow reproducing species;
- Habitat destruction - may result in the permanent loss of important habitats for birds and may have an impact on birds breeding, foraging and roosting; and

- Disturbance and Displacement activities – construction and maintenance activities may disturb birds, particularly during breeding seasons, and such disturbance may result in certain bird species being displaced from the Site.

1.5.6 Soils and Agriculture

The baseline environment has been established via a desk study covering soil, land capability, land use and agricultural potential. A site visit will be undertaken during the EIA phase to add to this desk based information, verify its content and feed into the design process and assessment of impacts.

Based on the baseline characteristics of the Proposed Development Site, as well as the experience of the specialists, potential soil and agriculture impacts have been identified as:

- Physical soil disturbance - associated with the construction of roads and the turbine construction sites, soil disturbance could result in indirect impacts arising in the form of soil erosion and degradation if storm water management is not planned and managed appropriately;
- Loss of current land use - the current land use predominantly consists of extensive grazing with very limited areas of crop production. Installed infrastructure (including turbines, access tracks, hardstanding and laydown areas, compounds etc.) will remove the current land use from these areas. However, it is noted that the Development footprint is relatively small when compared to the overall Proposed Development Site area; and
- Impacts on agricultural potential – the agricultural potential of the Site is low due to the low and erratic rainfall and shallow soils. Installed infrastructure will remove the agricultural potential from these areas. However, it is noted that the impact is considered to be low due to the low baseline agricultural potential.

1.5.7 Cultural Heritage, Archaeology and Palaeontology

The baseline environment has been established via desk study, which was undertaken via literature review. A site survey will be undertaken following Scoping. In addition, a field assessment of the paleontological sensitivity of the Proposed Development Site will be undertaken.

The Cultural Heritage, Archaeology and Palaeontology specialist was based in the area during his employment on the Zeekoe Valley Archaeological Project and as such this Draft Scoping Report section is based partly on extensive local experience and a good knowledge and understanding of the area's heritage.

- Based on the baseline characteristics of the Proposed Development Site, as well as the experience of the specialists, potential cultural heritage, archaeology and palaeontology impacts have been identified as:Direct impacts as a result of construction activities which have the potential to physically disturb the landscape, and any heritage resources that lie on it, or beneath it. Heritage, archaeological and paleontological sites which are highly context sensitive, are most vulnerable to direct impacts (damage or destruction) resulting from the alteration of the land surface;
- Indirect impacts as a result of the operational life of the Proposed Development which relate to changes to the feel, atmosphere and identity of a place or landscape, i.e., its setting. Such changes are evoked by visual intrusion, noise and changes in land use. Visual intrusion from the Proposed Development will not only arise from the turbines, but also from associated infrastructure including overhead power lines and road cuttings; and
- Decommissioning may result in impacts similar to construction however as the activities will be focussed on the existing infrastructure footprint, disturbance of

buried objects is less likely. With the removal of all above-ground infrastructure, any indirect impacts that occurred during the operational phase will be removed.

1.5.8 Noise

For the purposes of Scoping, the baseline environment has been considered through reference to noise monitoring carried out for other projects within 150 km of the Proposed Development. The prevailing noise environment is typical of rural areas. Potential additional local noise sources were identified and described, including roads, rail and other land uses, but were considered likely to contribute negligible levels of noise to the background environment. Following Scoping, a background noise survey will be carried out at the Proposed Development site.

Based on the characteristics of the Proposed Development Site, as well as the experience of the specialists, potential noise impacts have been identified as:

- Construction equipment - likely to include excavator/graders, bulldozers, dump trucks, vibratory rollers, bucket loaders, rock breakers, drill rigs, flatbed trucks, pile drivers, TLB, concrete trucks, cranes, forklifts and various 4WD and service vehicles;
- Traffic - Construction traffic to and from the site, as well as traffic on the site, has the potential to create significant noise impacts. The use of a borrow pits, onsite crushing and screening and on site concrete batching plants (if utilised) would significantly reduce heavy vehicle movement to and from the site;
- Material supply – concrete and stone will either be imported to site or will be batched on site (concrete) or extracted from onsite borrow pits;
- Wind turbine noise – can either be aerodynamic (as the turbine blade passes through the air) or mechanical (an audible tone from the gearbox/ generator). As the background wind speed increases, noise generated by the wind turbine also increases. New generation turbines do not generally emit any distinguishable tones; and
- Amplitude modulation - creates a repetitive rise and fall in sound levels synchronized to the blade rotation speed. The prevalence of complaints about amplitude modulation is relatively small but it is not clear whether this is because the phenomenon does not occur often enough, because receptors are not in the right place to observe it. Either way it is considered to have a low probability of occurring.

The following potential noise impacts are scoped out of the EIA due to their lack of potential to be significant:

- Blasting - may be required as part of the civil works to clear obstacles or to prepare foundations or to extract material for track construction if borrow pits are used;
- Transformer noise – 'humming' caused when the core of the transformer changes shape when being magnetised;
- Transmission Line (Corona) Noise – caused by the partial breakdown of the insulation properties of air surrounding the conducting wires; and
- Low Frequency Noise – despite research, great uncertainties continue to exist around Infrasound and Low Frequency Noise. While problems have been associated with older wind turbines in the 1980s modern turbines do not suffer from the same problems.

1.5.9 Social

The baseline environment has been established via desk study. Following Scoping, a site visit will be conducted with interviews with key stakeholders in the area including local land owners and authorities, local community leaders and councillors, local residents associations and residents, local businesses, community workers, etc.

Based on the baseline characteristics of the Proposed Development Site, as well as the experience of the specialists, potential social impacts have been identified as:

- Creation of employment and business opportunities during the construction and operational phases;
- Training and skills development opportunities for local communities and businesses;
- Beneficial up and down-stream economic opportunities for the local, regional and national economy;
- Provision of a clean, renewable energy source for the national grid;
- Benefits associated with the establishment of a Community Trust/ Fund.
- Impact on rural sense of place (this will be closely linked to the visual impacts);
- Impact on farming activities and other existing land uses;
- Impact on property prices, specifically adjacent properties;
- Impact on tourism, both locally and regionally;
- Impacts associated with the presence of construction workers during the construction phase, including an increase in sexually transmitted diseases, including HIV/AIDS; increase in prostitution; increase in alcohol and drug related incidents; increase in crime; and creation of tension and conflict in the community;
- Risk to security and safety of local farmers posed by construction workers; and
- Impacts associated with the influx of job seekers into the area during the construction phase.

1.6 Conclusions and Next Steps

Environmental surveys have started and where possible this survey information has been included in this Draft Scoping Report, along with the identification of potential impacts for assessment in the EIA.

The Draft Scoping Report is being made available for public and stakeholder comment for a prescribed consultation period of 40 days. All comments received in response to the Draft Scoping Report will be incorporated into a Final Scoping Report and PSEIA. I&APs are then able to comment on the Final Scoping Report and PSEIA by submitting their comments directly to the DEA, notification regarding the availability of the Final Scoping Report and PSEIA as well as the contact details for submission to the DEA will be distributed to registered I&APs.

The Final Scoping Report is then submitted to the DEA, as the competent authority, for approval. This marks the formal end of the Scoping phase, after which the EAP undertakes the EIA and compiles the DEIAR which will then, like the Draft Scoping Report, be made available for public and stakeholder comment for a period of 40 days. Any comments will then be considered and incorporated as applicable into a FEIAR. I&APs are then notified of the availability of the FEIAR and advised that should they like to comment on the report, they must submit their comments directly to the DEA (contact details of the DEA will be included in the notification documents).

Once a FEIAR has been submitted the competent authority (the DEA) will make a decision on whether or not to grant or refuse Environmental Authorisation.

If granted, the EA will be granted (or not) for the listed activities as described in the FEIAR, only these activities can be triggered by the Project.