

PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT

CHAPTER 10

A detailed description of the nature and extent of the proposed wind energy facility and associated infrastructure on the West Coast, details regarding the Scoping Phase followed, as well as the issues identified and evaluated through the Scoping phase (to date) have been included in the Final Scoping Report. This provides the context for a Plan of Study for Environmental Impact Assessment (EIA).

The Plan of Study describes how the EIA Phase for the proposed wind energy facility project will proceed. The EIA Phase of the study includes detailed specialist studies for those impacts recorded to be of significance. The key findings of the Scoping Phase (which includes inputs from authorities, the public, the proponent and the EIA specialist team) are used to inform the Plan of Study for EIA, together with the requirements of the NEMA EIA Regulations and applicable guidelines.

10.1. Aims of the EIA Phase

The EIA Phase will aim to achieve the following:

- » Provide an overall assessment of the social and biophysical environments affected by the proposed project
- » Assess potentially significant impacts (direct, indirect and cumulative, where required) associated with the proposed wind energy facility and associated infrastructure
- » Identify and recommend appropriate mitigation measures for potentially significant environmental impacts
- » Undertake a fully inclusive public involvement process to ensure that I&AP are afforded the opportunity to participate, and that their issues and concerns are recorded.

The EIA will address potential environmental impacts and benefits (direct, indirect and cumulative impacts) associated with all phases of the project including design, construction and operation, and will aim to provide the environmental authorities with sufficient information to make an informed decision regarding the proposed project.

10.2. Authority Consultation

Consultation with the regulating authorities (i.e. DEAT and DEA&DP) has been undertaken throughout the Scoping Phase and will continue throughout the EIA process. On-going consultation will include the following:

- » Invitation to attend a key stakeholder meeting during the review period of the Draft Scoping Report (i.e. 23 August 2007).
- » Submission of a Final Scoping Report following the 30-day public review period (and consideration of comments received).
- » A consultation meeting with DEAT and DEA&DP in order to discuss the findings of the Scoping Report and the issues identified for consideration in the EIA process.
- » An opportunity to visit and inspect the site.
- » Submission of a Final Environmental Impact Assessment Report following a public review period.
- » A consultation meeting with DEAT and DEA&DP in order to discuss the findings and conclusions of the EIA Report.

10.3. Consideration of Alternatives

The following project alternatives will be investigated in the EIA:

- » **The 'do nothing' alternative:** Eskom does not establish a wind energy facility in the Western Cape (maintain status quo).
- » **Site-specific alternatives:** in terms of actual turbine positions and positions of the associated infrastructure on the site (i.e. access roads, substation/s, visitors centre over a 25 km² area).
- » **Alternative technologies:** for use in the establishment of the wind facility.
- » **Alternative servitudes for powerline routing:** Network integration studies, planning and design for the transmission of the power generated at the wind energy facility is still being finalised. This will be informed through understanding the local power requirements and the stability of the local electricity network. A 132 kV powerline is proposed to connect the substation/s at the wind energy facility to the electricity distribution network/grid at either the Koekenaap Distribution Substation or the Juno Transmission Substation (outside Vredendal). The connection point to the Eskom power grid will be confirmed through the network integration and planning exercise. Alternative routes/corridors for the 132 kV powerline will be assessed in the EIA phase.

10.4. Assessment of Potential Impacts and Recommendations regarding Mitigation Measures

Based on the findings of the Final Scoping Study, the following issues were identified as not requiring further investigation within the EIA:

- » Potential impacts on agricultural potential
- » Potential impacts on groundwater resources
- » Potential impacts associated with geology and soil erosion (subject to a detailed geotechnical study being undertaken by the project proponent)

A summary of the issues which require further investigation within the EIA phase, as well as the proposed activities to be undertaken in order to assess the significance of these potential impacts is provided within Table 10.1. The specialist involved in the EIA Phase are also reflected in Table 10.1. These specialist studies will consider the site proposed for the development of the wind energy facility and all associated infrastructure (including alternatives with regards to design, layout and technology), as well as the alternative alignments of the proposed overhead powerline and access road/s.

Each specialist study will include:

- » A description of the affected environment
- » A description of issues identified during the scoping process
- » The methodology of determining the significance of the impacts (and assumptions)
- » An impact statement considering:
 - * An assessment of impacts
 - * A comparative assessment of alternatives
- » Conclusions
- » Recommended site-specific mitigation

Table 10.1: Summary of the issues which require further investigation within the EIA phase and activities to be undertaken in order to assess the significance of these potential impacts

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
Impact on vegetation	<p>» The specialist study to be undertaken in the EIA phase will be undertaken in accordance with the requirements of the DEA&DP guidelines for biodiversity studies. This study will:</p> <ul style="list-style-type: none"> * Assess local and regional impacts (direct and indirect) associated with the proposed wind energy facility and associated infrastructure * Detailed assessment considering direct, indirect and cumulative impacts for all phases of the project * Make detailed mitigation suggestions for the planning, construction and operational stages. <p>» Recommendations will be included within the construction and operational phase EMPs.</p> <p>» Further botanical fieldwork is unlikely to be required at the EIA stage.</p>	Nick Helme of Nick Helme Botanical Surveys
Impact on fauna	<p>The specialist study to be undertaken in the EIA phase will be undertaken in accordance with the requirements of the DEA&DP guidelines for biodiversity studies. This study will include:</p> <ul style="list-style-type: none"> » A ground survey of the terrestrial fauna present on the site, specifically to: <ul style="list-style-type: none"> * ascertain whether any of the Red Data species that potentially occur in the study area, are in fact present on the site * identify areas within the proposed site that may be more sensitive than other parts in terms of animal occupation » An assessment of the feasibility of pre-construction removal of animals from the site, based on numbers present on the site. » Detailed assessment considering direct, indirect and cumulative impacts for all phases of the project <p>It should be possible to obtain substantial information by walking several representative transects on the site, searching for signs of animal occupation. Limited trapping for rodents will be required. Active searching for reptiles and amphibians, including raking under plants to locate fossorial lizards and snakes should be supplemented by the use of drift fences, pitfall- and funnel traps to locate secretive species such as the Namaqua Plated Lizard (<i>Gerrhosaurus typicus</i>). A detailed survey of the invertebrate fauna of the site will probably not be possible within the time limits set for completion of the EIA, although every attempt will be made to identify all invertebrate species encountered on the site during the search for vertebrates.</p>	Prof. Le Fras Mouton of the Department of Botany & Zoology, Stellenbosch University

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
Impacts on birds	<p>The specialist study to be undertaken in the EIA phase will:</p> <ul style="list-style-type: none"> » Assess issues identified in the scoping phase in more detail. » Detailed assessment considering direct, indirect and cumulative impacts for all phases of the project » In particular the significance of bird collisions with the turbines will be assessed in order to determine whether the risk warrants mitigation such as painting turbines (as discussed in the scoping avifauna report). The significance of this impact will depend on a number of factors such as abundance of certain bird species (and habitats and prey), topography, prevalence of evening fog and many others. <p>The result of the EIA phase will be a more detailed assessment of all impacts, recommended mitigation where necessary, and a monitoring programme.</p>	Jon Smallie of the Endangered Wildlife Trust (EWT)
Geomorphological impacts	<p>The specialist study to be undertaken in the EIA phase will:</p> <ul style="list-style-type: none"> » Describe the Regional Geomorphic Setting (e.g. climate, geology, topography) of the potentially affected environment (viz. the power line corridor and area selected for the siting of the turbines). » Map the area covered by landforms sensitive to development (e.g. pans and drainage lines). » Describe and indicate on a map any geosites of significance that require management. » Assess the current state of the landscape in relation to geomorphological indicators of rangeland condition. » Assess potential projected related impacts listed in this report with a significance rating of low or greater. If applicable, identify other impacts that may not have been identified and assess them in the same way. » Propose means to avoid, mitigate or offset potential project related impacts. » Detailed assessment considering direct, indirect and cumulative impacts for all phases of the project. <p>The report will include an Environmental Impact Statement. The study will not consider the impact of geotechnical aspects of the environment on the proposed development or the potential impact of geomorphic processes on the health of humans or other biological organisms.</p>	Pete Illgner (Environmental Consultant and Researcher)

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
Noise impacts	<p>The potential impact of noise associated with the following aspects will need to be considered in more detail in accordance with procedures contained in SANS 10328:</p> <ul style="list-style-type: none"> » Noise emissions from the wind turbines. » Construction noise associated with the upgrading of existing gravel road through Koekenaap. » Construction noise associated with construction of new access roads. » Noise emission from construction and transportation vehicles along access routes through towns and other potentially noise sensitive land. » Detailed assessment considering direct, indirect and cumulative impacts for all phases of the project 	Adrian Jongens of Jongens Keet & Associates
Tourism potential impacts	<p>A detailed investigation of potential impacts on tourism potential i) during the construction phase and ii) during the operations phase of the project will be further investigated during the EIA stage. Such site-specific potential negative impacts to be further investigated may include:</p> <ul style="list-style-type: none"> » <i>Visual impacts:</i> Preliminary visual analysis indicates that the proposed wind energy facility will be visible from certain locations along the N7 and the tourism route from Lamberts Bay to Vredendal via Strandfontein. The exact nature of such visual impacts requires further investigation. » <i>Noise impacts:</i> Given the large size of the site and the number of turbines envisaged the noise factor may be substantial in the immediate vicinity of the site. The potential negative effects of such noise on the bird population at the Olifants River Mouth and the impact on its potential as a major birding site was raised as a concern by environmental interest groups during the stakeholder interviews. While it not envisaged that the noise factor will extend over this distance the extent of noise required further analysis. » <i>Physical impacts:</i> the construction of the supportive road and powerline infrastructure and of the turbines may disturb the natural scenery and landscape of the area and the extent and impact of such disturbances on tourism requires further investigation. <p>Potential site-specific positive impacts to be investigated may include:</p> <ul style="list-style-type: none"> » Economic impacts: Visitor numbers may increase due the special interest and novelty value of the site and this should be further analysed based on relevant assumptions, such as the nature and extent of visitor interpretation facilities, etc.; 	Mike Fabricius of The Journey

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	<p>» Improvements in the site setting and surrounds: Improvements of the special landmarks and potential visitor points along the coastline may unlock visitor attractiveness and provide opportunities for entrepreneurship associated with hiking trails, camping and picnicking, etc. Such opportunities require further investigation.</p> <p>More specifically tourism inputs during the detailed phase will include:</p> <p>» A more detailed analyses of extent and significance of the potential tourism impacts of the facility and the related road and powerline infrastructures, taking into account the results of specialist studies pertaining to visual, noise and other potential impacts during the various phases of the project;</p> <p>» Detailed assessment considering direct, indirect and cumulative impacts for all phases of the project</p> <p>» Analysis and investigation of the properties and potential mitigation measures to improve the site and surrounds from a tourism perspective and the extent and significance of such measures;</p> <p>» Further consultation with tourism role-players to ascertain their views and potential level of involvement in the project.</p>	
Impacts on heritage sites	<p>The specialist study to be undertaken in the EIA phase will:</p> <p>» Require a detailed physical survey of the study area so that the locations of visible generally protected heritage can be recorded and the layout of the development adjusted where necessary.</p> <p>» Detailed assessment considering direct, indirect and cumulative impacts for all phases of the project</p> <p>» Include an environmental management plan to include follow up heritage work such as monitoring of excavations or archaeological sampling.</p> <p>The detailed heritage studies will be undertaken in accordance with the requirements of the DEA&DP specialist guidelines, as well as the requirements of Heritage Western Cape.</p>	Tim Hart of the Archaeology Contracts Office, Department of Archaeology: University of Cape Town
Visual impacts	<p>The specialist study to be undertaken in the EIA phase will include:</p> <p>» Additional spatial analyses are to be undertaken in order to create a visual impact index that will further aid in determining potential areas of visual impact. This exercise will be undertaken for the core wind energy facility as well as the ancillary infrastructure, as these (the substation,</p>	Lourens du Plessis of MetroGIS

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	<p>access road, and distribution line) are envisaged to have varying levels of visual impact at a more localised scale.</p> <ul style="list-style-type: none"> » The site-specific issues (as detailed in the specialist visual scoping report) and potential sensitive visual receptors should be measured against this visual impact index and be addressed individually in terms of nature, extent, duration, probability, severity and significance of visual impact. » Detailed assessment considering direct, indirect and cumulative impacts for all phases of the project <p>The detailed visual impact assessment will be informed by the DEA&DP Guidelines for visual specialist studies, as well as the requirements of Report 6 of the Western Cape Provincial Guidelines for the determination of sites for the development of Wind Energy Facilities.</p>	
Transportation and access	<p>The specialist study to be undertaken in the EIA phase will:</p> <ul style="list-style-type: none"> » Consider the environmental aspects of those routes nominated as the most suitable routes for transport of components and equipment between Saldanha Bay and the site. » Provide recommendations for the upgrade and/or maintenance of the access road to the site. » Consider on-site aspects pertaining to access and manoeuvrability on site, specifically during the construction phase of the project. » Provide recommendations for the transportation strategy which will be required to be considered and compiled by the transport contractor appointed for the project. » Consider re-constructing DR 2225 as formal surfaced rural road between Koekenaap and Skaapvlei, with appropriate stormwater drainage to provide a good quality transport route during construction and avoid the on-going gravel road routine maintenance that will be required to keep the road in good condition at all times. 	Mark Pinder of Arup SA (Pty) Ltd
Social Impact Assessment	<p>The identification and assessment of social impacts will be guided by the specialist SIA Guidelines adopted by DEA&DP in the Western Cape. The SIA will consider:</p> <ul style="list-style-type: none"> » A detailed assessment considering direct, indirect and cumulative impacts for all phases of the project » Potential up and down-stream economic opportunities for the local, regional and national economy. » Job and business creation opportunities during the construction phase. » Job and business creation opportunities during the operational phase. 	Tony Barbour (Environmental Consultant and Researcher)

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	<ul style="list-style-type: none"> » Creation of potential opportunities to support local communities, including education and training and community based projects and programmes. » Impact on tourism. » Impact on farming activities. » Impact on property prices. » Influx of job seekers into the area during the construction phase. The influx of job seekers may result in 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. » Impact on rural sense of place (this will be closely linked to the visual impacts). » Impacts on people residing in close proximity to the site. » Potential impact on the local tourism industry (positive and negative). » Potential implications for Eskom’s alternative energy programme and people perceptions about alternative energy. » Potential impacts on the farmers in the area: <ul style="list-style-type: none"> * Impact on farming activities and farm property values; * Impact on rural, undeveloped, open “sense of place”; * Threat to farm safety due to increased number of people in the area and construction workers; * Stock losses (during the construction and operational phase); * Damage to water pipes and other farm infrastructure (during the construction and operational phase); * Damage to roads by heavy equipment and increased traffic volumes (during the construction and operational phase); * Impact on farming operations (during the construction and operational phase). » Social impacts associated with the access road and 132kV powerline that connects the proposed wind energy facility. » The detailed public consultation process will be undertaken during the EIA phase of the project. The consultation process for the SIA will be separate to the consultation process for the EIA. In this regard the consultation process for the SIA will focus on one-on-one interviews with key stakeholders and, where necessary, workshops and meetings with community representatives. 	

10.5. Methodology for the Assessment of Potential Impacts

Direct, indirect and cumulative impacts of the above issues, as well as all other issues identified will be assessed in terms of the following criteria:

- » The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- » The **extent**, where it will be indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score between 1 and 5 will be assigned as appropriate (with a score of 1 being low and a score of 5 being high).
- » The **duration**, where it will be indicated whether:
 - * the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
 - * the lifetime of the impact will be of a short duration (2–5 years) - assigned a score of 2;
 - * medium-term (5–15 years) – assigned a score of 3;
 - * long term (> 15 years) - assigned a score of 4; or
 - * permanent - assigned a score of 5.
- » The **magnitude**, quantified on a scale from 0–10, where a score is assigned:
 - * 0 is small and will have no effect on the environment;
 - * 2 is minor and will not result in an impact on processes;
 - * 4 is low and will cause a slight impact on processes;
 - * 6 is moderate and will result in processes continuing but in a modified way;
 - * 8 is high (processes are altered to the extent that they temporarily cease); and
 - * 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- » The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale, and a score assigned:
 - * Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
 - * Assigned a score of 2 is improbable (some possibility, but low likelihood);
 - * Assigned a score of 3 is probable (distinct possibility);
 - * Assigned a score of 4 is highly probable (most likely); and
 - * Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- » the **significance**, which shall be determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
- » the **status**, which will be described as either positive, negative or neutral.
- » the *degree* to which the impact can be *reversed*.

- » the *degree* to which the impact may cause *irreplaceable loss of resources*.
- » the *degree* to which the impact can be *mitigated*.

The **significance** is determined by combining the criteria in the following formula:

$S=(E+D+M)P$; where

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- » < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- » 30-60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- » > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

As Eskom has the responsibility to avoid or minimise impacts, and plan for their management (in terms of the EIA Regulations), the mitigation of significant impacts will be discussed. Assessment of impacts with mitigation will be made in order to demonstrate the effectiveness of the proposed mitigation measures.

10.5.1. Integration and Preparation of the EIA Report

The results of the specialist studies and other available information will be integrated and synthesised by the Savannah Environmental project team. An EIA report will be compiled, and will include:

- » **detailed description** of the proposed activity
- » a description of the property(ies) on which the activity is to be undertaken and the location of the activity on the property(ies)
- » 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
- » details of the **public participation process** conducted, including:
 - * steps undertaken in accordance with the plan of study for EIA;
 - * a list of persons, organisations and organs of state that were registered as interested and affected parties;

- * 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 to those comments; and
- * copies of any representations, objections and comments received from registered interested and affected parties
- » a description of the **need and desirability** of the proposed project and 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
- » an indication of the methodology used in determining the **significance** of potential environmental impacts
- » a description and comparative **assessment of all alternatives** identified during the environmental impact assessment process
- » a summary of the findings and recommendations of **specialist reports**
- » 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
- » an assessment of each identified potentially significant impact
- » a description of any assumptions, uncertainties and gaps in knowledge
- » an environmental **impact statement** which contains:
 - * a summary of the key findings of the environmental impact assessment; and
 - * a comparative assessment of the positive and negative implications of the proposed activity and identified alternatives
- » a draft **environmental management plan**
- » copies of specialist reports

A Peer Review of the EIA process will be undertaken by Jonathan Crowther of CCA Environmental.

The draft EIA Report will be released for a public review and comment period. The comments received from I&APs will be captured within a Comments and Response Report, which will be included within the final EIA Report, for submission to the authorities for decision-making.

10.5.2. Public Participation Process

A public participation process will be undertaken by Sustainable Futures ZA in conjunction with Savannah Environmental. Consultation with key stakeholders and I&APs will be on-going throughout the EIA process. Through this consultation process, stakeholders and I&APs will be encouraged to identify additional issues of concern or highlight positive aspects of the project, and to comment on the findings of the EIA process.

In order to accommodate the varying needs of stakeholders and I&APs within the study area, as well as capture their inputs regarding the project, various opportunities will be provided for stakeholders and I&APs to be involved in the EIA phase of the process, as follows:

- » Focus group meetings (pre-arranged and stakeholders invited to attend).
- » One-on-one consultation meetings (for example with directly affected landowners).
- » Telephonic consultation sessions (consultation with various parties from the EIA project team, including the project participation consultant, lead EIA consultant as well as specialist consultants).
- » Written, faxed or e-mail correspondence.

The draft EIA report will be made available for public review and comment period prior to finalisation and submission to DEAT for review and decision-making. In order to provide an overview of the findings of the EIA process and facilitate comments, a public meeting and key stakeholder workshop will be held during this public review period.

The public involvement process will also include the distribution of a notification regarding the Record of Decision issued for the project, describing the relevant details pertaining to the appeal period.

10.5.3. Key Milestones of the programme for the EIA

The envisaged key milestones of the programme for the Environmental Impact Assessment (EIA) phase of the project are outlined in the table below.

Key Milestone Activities	Proposed completion date
Submission of Final Scoping Report	September 2007
Authority acceptance of the Final Scoping Report and Plan of Study to undertake the EIA	October 2007
Undertake detailed specialist studies and public participation process for EIA Phase	October 2007– December 2007
Compile Draft EIA Report and Draft EMP	December 2007
Make Draft EIA Report and Draft EMP available to the public, stakeholders and authorities	January 2008
Finalisation of Environmental Impact Assessment Report	February 2008
Submit Final EIA Report to DEAT for review and decision-making	February 2008