Annex K

Socio-economic Specialist Report

CONTENTS

1 SOCIO-ECONOMIC IMPACTS

1.1 BENEFITS FOR THE LOCAL ECONOMY

1.1.1 Impact Description and Assessment

The development of the wind farm will result in significant spending in South Africa having a positive impact on the national, regional and local economy to varying degrees. Direct impacts such as employment and procurement associated with the project will have the most significant impact when compared to indirect and induced impacts. However, overtime as the renewable sector develops additional benefits to the national economy may accrue as the supply chain to the renewable energy sector develops. The direct impacts will be most significant during the construction phase of the project, and are likely to have the largest influence on the local economy. *Table 1.1* provides a summary of the impact.

Table 1.1 Impact Characteristics: Benefits for the Local Economy

Summary	Construction	Operation
Project Aspect/ activity	Employment and Procurement of Local contractors. Lease Agreements with directly affected farmers.	Employment and Procurement of Local contractors. Lease Agreements with directly affected farmers. Development of the supply chain for the wind energy sector.
Impact Type	Direct, positive impact.	Direct, indirect and induced positive impact.
Stakeholders/ Receptors Affected	Local community, Local Municipality, and Directly Affected Landowners.	Local community, Local Municipality, suppliers throughout South Africa and Directly Affected Landowners.

Construction Phase Impacts

The capital investment required for the wind farm is high at approximately R1 billion which will be spent over a 12 to 24 month period. During the construction phase the civil and other construction, specialised industrial machinery and building construction sectors would benefit the most. Local procurement will primarily benefit the civil and construction industry, hospitality and service industries, such as accommodation, catering, cleaning, transport, vehicle servicing and security services.

The highly specialised machinery required for the project will, however, require that the majority of the technical components associated with the wind turbines be imported from specialist suppliers. The renewable energy sector is still relatively small in South Africa and at this stage appropriate supplies and service providers are not currently available in the country; this may, change over time. It is estimated that 70 percent of the project spend will be

on turbines which will be imported, 20 percent will be on the balance of plant (buildings, substations etc) and ten percent on development. While the value of imports is high, it is likely the majority of the balance of plant will be sourced from South Africa, resulting in a significant spend in the national economy.

It is estimated that approximately 346 direct temporary site construction jobs will be created for the duration of the construction and commissioning phases which is estimated to be 24 months. Additional indirect jobs will be created in other affected sectors such as the catering and hospitality industry through the presence of the project in the area.

There are high levels of unemployment in the project area (between 16 and 18 percent) and while the most common skills are related to the farming sector, there are some people involved in construction work with Eskom and road construction. It is intended that G7 and its contractors will source the majority of the unskilled workers from the surrounding municipal area with the remainder being sourced regionally, where they are not available locally. In the local municipal context, this translates into a significant benefit to the local unemployed population, even though these opportunities will only be for the short term i.e. for the duration of the construction phase.

While the intention is to source unskilled jobs locally, there may be some unintended impacts on local farmers, should the relatively skilled farm labourers be recruited for the construction phase of the project. The project may result in raised wage expectation of workers from farmers assuming the project will be able to offer workers a better salary. This may result in strained relationships between the developer and local farmers. This could also have an unintended impact on the livelihoods of the skilled farm labourers who may loose their permanent job, and associated security, for a short term job.

It is unlikely that there are many people with the required skills available to fill highly-skilled and semi-skilled opportunities at the local municipal level. There may be more suitably highly and semi-skilled people available at the provincial and national levels.

Initial recruitment and training for local personnel will take place prior to and during the construction phase, in conjunction with G7's contractors. Tasks on site will require skills in a number of areas, including working at height, electrical safety, specific maintenance and troubleshooting, isolation for maintenance, etc. The construction work will create an opportunity for 'on-the-job' training thus increasing general skills levels. The opportunities for skills development and training would extend through from skilled to unskilled personnel. G7 will notify identified representatives of the local municipality of the specific jobs and the skills required for the project. This will give the local population time prior to the beginning of construction and operation to enable them to attain the relevant skills/qualifications.

Furthermore, G7 anticipate that during construction 50 indirect jobs will be created by the proposed project. These will be jobs created by the presence of the construction teams' need for accommodation, food and other essentials. *Box 1.1* describes the impact of benefits for the local economy during the construction phase.

Box 1.1 Construction Impact: Benefits for the Local Economy

Nature: The benefit to the local economy will be **direct** via employment and procurement of services and **indirect** employment in other industries affected by the project such as accommodation and catering industries; as well as via spending in the local economy due to increase in wages.

Impact Magnitude – Medium

- **Extent:** Employment and procurement of service will be created for South African's at a **local, provincial and national** level depending on skills and capacity availability.
- **Duration:** Employment generated during the construction phase will take place over a 12 to 24 month period and will therefore be **short-term**.
- **Intensity:** The intensity will be **medium** as there will be approximately 100 jobs created with approximately 30 percent of the total investment being spent on goods and services in South Africa during the construction phase.

Likelihood – This impact will **definitely** occur.

IMPACT SIGNIFICANCE (PRE-ENHANCEMENT) – MODERATE POSITIVE

Degree of Confidence: The degree of confidence is **medium** given that actual figures are not yet available due to the early stage of this project.

Operational Phase Impacts

Direct benefits

Similar to the construction phase, the majority of goods and services will be highly specialised and technical in nature with up to 70 percent of the operational expenditure being initially imported in the form of expatriate engineers. Locally procured services will include maintenance work for balance of plant facilities, 24 hour security and cleaning contracts resulting in an ongoing investment injection. Over time, as businesses develop locally to meet the needs of the renewable energy sector, levels of procurement may increase.

Turbine operation is largely automated with routine scheduled services taking place on average twice per annum. There will be a dedicated operations team comprising approximately 122 full time personnel operating the facility in daytime hours. The types of jobs that will be generated during the operations phase are likely to include:

- 58 technicians (including Site Manager and Supervisor);
- 58 apprentices;
- 12 high voltage personnel (persons trained to handle and manage high voltage power lines); and

- 20 administrative staff.

In addition, there will be a number of contract jobs including skilled balance of plant maintenance personnel for electrical balance of plant works and crane operators/crew. There are likely to be additional jobs including a number of personnel to cover 24 hour site security, as well as some cleaning contracts. These personnel will be sourced locally at the municipal level where possible. If the appropriate skills are not available at the municipal level these services will be sourced regionally.

General training will be provided in management systems, wind turbine performance review. Much of the knowledge regarding wind turbine operations and maintenance will be acquired 'on-the-job'. It is envisaged that G7 operations personnel will be increasingly trained up and qualified to high levels over a five to six year timeframe, consistent with demonstrated capability and ambition.

The farmer will receive payments from G7 for the use of the land for the life of the Project and the value of the directly affected farms are likely to increase as a result of the added income stream. The wind farm will occupy approximately two to three percent of the farm area, allowing the existing farm activities to continue. This will enable the landowner to supplement his existing income as opposed to replacing it; this is possible given that the majority of the farm is being used for grazing activities.

Indirect and induced benefits

Apart from the direct benefits resulting from the operational spend and direct jobs created, the spending of those employed directly would result in a positive indirect impact on the local and regional economy.

The landowners have plans to increase production on their farms by investing the capital received from the developer into improving farming infrastructure, such as irrigation systems and improving existing buildings. More details are provided on how farmers intend to spend the additional income in the Socio-Economic Baseline *Section 6*.

These planned improvements and intensification of farming methods will create employment opportunities on the farm and increase spending on goods and services. Especially in cases where the farmers intend to expand cultivation activities. Two of the farmers noted that they wanted to decrease the number of livestock, and increase the area under cultivation by installing irrigation systems.

The supplemental income that the landowners receive for the wind farm will enable them to sustain the farms through difficult years, making their farms, and therefore their livelihoods, more sustainable.

The potential for the proposed project and other future projects to result in greater impacts on local economies and the South African economy as a whole

is primarily dependent on economies of scale. Initially import content will be high. However, if the sector grows in size it should provide opportunities for growth of the local supply chain and the additional benefit that would flow from this. The introduction of a large-scale renewable energy programme could provide local economic opportunities for component manufacture, and with an appropriate industrial policy it would be possible to leverage South Africa's relatively cheap steel resources. The distance from other international manufacturers will also confer a competitive advantage, especially for less-specialised large-scale components such as steel towers. *Box 1.2* describes the impact of benefits for the local economy during the operation phase.

Box 1.2 Operational Impact: Benefits for the Local Economy

Nature: The benefit to the local economy will be **direct** via employment and procurement of services and **indirect** and induced benefits via the spend in the local economy due to increase in wages; local supply chain etc.

Impact Magnitude – Medium

- **Extent:** Employment and procurement of service will be created for South African's at a **local, provincial and national** level depending on skills and capacity availability.
- **Duration:** Employment and procurement of services will be generated during the operational phase over a period of 25 years and will therefore be **long-term**.
- **Intensity:** The intensity will be **low-medium** in the short term as the majority of services will be imported. As the sector matures, the intensity is likely to increase with additional benefits to the economy through the increased employment of local suppliers, increase job opportunities on the farms and increase in the local turbine manufacturing sector.

Likelihood – This impact will definitely occur.

IMPACT SIGNIFICANCE (PRE-ENHANCEMENT) – MODERATE POSITIVE

Degree of Confidence: The degree of confidence is **medium** given that actual figures are not yet available due to the early stage of this Project.

1.1.2 Mitigation and Enhancement

The objective of enhancement is to optimise opportunities for employment and procurement of local labour and services, wherever possible, or alternatively that procurement at a regional or national level.

<u>Community Development:</u>

- G7 should continue, as is their stated intention, to explore ways to enhance local community benefits with a focus on broad-based BEE through mechanisms such as community shareholding schemes and trusts. At this preliminary stage, and in accordance with the relevant BEE legislation and guidelines, up to four percent of after tax profit could be used for community development over and above that associated with expenditure injections into the area. As such;

    - G7 to establish a Community Development Trust for the advancement of local development needs; specifically at the farm level.

- G7 to establish a Community Development Trust for the advancement of local development needs; specifically at the local municipality level.

- Based on R0.9/kWh as a set Feed-in tariff, G7 would contribute up to four percent of after tax profit to the Trusts or an equivalent in percentage of income.

- Projects will be identified in collaboration with the Local Municipality and community representatives to ensure alignment with the key needs identified through the Integrated Development Planning process.

- All projects will be aligned with G7's policies.

Employment and procurement

It is important to recognise that the nature of the project dictates that large proportions of specialist skills and materials will have to come from outside of South Africa as well as the local municipal area with a high portion of international imports. However, the objective of enhancement is to optimise opportunities for employment/procurement of local people/suppliers or alternatively that employment and procurement opportunities are enhanced on a regional or national basis, where possible.

The following measures will be implemented to ensure that employment of local people is maximised and procurement of local, regional and national services is maximised:

- G7 will establish a recruitment and procurement policy which sets reasonable targets for the employment of South African and local residents /suppliers (originating from the local municipalities) and promote the employment women as a means of ensuring that gender equality is attained. Criteria will be set for prioritising, where possible, local (local municipal) residents/suppliers over regional or national people/suppliers. All contractors will be required to recruit and procure in terms of G7's recruitment and procurement policy.

- G7 will work closely with relevant local authorities, community representatives and organisations to ensure that the use of local labour and procurement is maximised. This may include:
    - sourcing and using available databases on skills/employment-seekers that local authorities may have;
    - advertising job opportunities and criteria for skills and experience needed through local and national media; and
    - conducting an assessment of capacity within the Local Municipalities and South Africa to supply goods and services over the operational lifetime of the proposed project.

- No employment will take place at the entrance to the site. Only formal channels for employment will be used.

- All skill requirements to be communicated to the local communities via appointed people prior to the commencement of the construction phase.

- G7 to work closely with the wind turbine suppliers to provide the requisite training to the workers. The training provided will focus of development of local skills.

- Ensure that the appointed project contractors and suppliers have access to Health, Safety, Environmental and Quality training as required by the Project. This will help to ensure that they have future opportunities to provide goods and services to the sector.

1.1.3 Residual Impact

The implementation of the above measures would ensure that the construction impacts remain of moderate significance and ensure that the significance of the operation impact remains a moderate positive. The pre- and post- enhancement impacts are compared in *Table 1.2*.

Table 1.2 Pre- and Post- Enhancement Significance: Benefits for the Local Economy

Phase	Significance (Pre-enhancement)	Residual Impact Significance
Construction	**MODERATE positive**	**MODERATE positive**
Operation	**MODERATE positive**	**MODERATE positive**

1.2 INCREASED SOCIAL ILLS LINKED TO INFLUX OF WORKERS AND JOB-SEEKERS

1.2.1 Impact Description and Assessment

The introduction of construction activity in remote, rural environments can sometimes bring about social change. This change is typically due to an influx of workers and job-seekers into the area. As a worst-case scenario, these changes have been known to increase levels of crime, drug and alcohol abuse, increased incidence of sex workers, and domestic violence.

The proposed project area is located outside town in a predominantly rural setting. The population density of the immediate area is low and the majority of land is farmland. The only people living on the proposed project site and on the neighbouring farms are the landowners and their farm workers. An influx of 'outsiders' could pose a risk to existing family structures and social networks.

Table 1.3 below provides a summary of the increased social ills impact at the construction and operational phases of the proposed project as well as an indication of the stakeholders that may be affected.

Table 1.3 Impact Characteristics: Increased Social Ills

Summary	Construction	Operation
Project Aspect/ activity	Construction staff on site and potential influx of job-seekers.	Operation staff on site.
Impact Type	Direct and indirect, negative impact	Direct, negative impact
Stakeholders/ Receptors Affected	Local residents of the area, more specifically landowners of directly affected farms and neighbouring farms.	Local residents of the area, more specifically landowners of directly affected farms and neighbouring farms.

Construction Phase Impacts

G7 has estimated that there will be approximately 346 people employed during the construction phase, which they have estimated will take between 12 to 24 months. Due to the early phase of this proposed project, specific arrangements have not yet been made regarding worker accommodation and terms of employment, however farmers have requested that construction workers do not stay on the farms. Given that the proposed project is located along the arterial road R354, it is likely that the workers (from outside the area) will be accommodated in/close to the town of Laingsburg. This will increase the levels of interaction with the local communities. The majority of workers are likely to be male and living away from their families. There are existing problems associated with substance abuse in the community. The increased disposable income from the jobs that will be created could be spent on drugs and alcohol, exacerbating social ill affecting the community.

The most likely social ills that may occur as a result of the increased number of workers and job-seekers are described below.

- **Theft of livestock** is already problematic on farms located close to towns, roads and in areas where construction work is taking place. It is likely that stock theft will continue and possibly increase during the construction phase. Landowners believe that there are syndicates operating in the area. This has led to some farmers hiring full time guards to walk the fences of their farms weekly. The improved road network proposed for the project site will allow for increased access to the site, thus potentially exacerbating the problem of stock theft.

- **Petty crimes** (e.g. theft of tools, household items and farm materials) on the project affected farm and neighbouring farms could occur.

- An increase in disposable income within the project area (among workers) could result in an **increase in alcohol and drug abuse**, **increased incidences of prostitution and casual sexual relations.** These sexual relations could result in increased incidents of HIV/AIDS and increased numbers of unwanted pregnancies.

The skilled workers are likely to be housed in formal accommodation facilities and are unlikely to exacerbate this impact and the low skilled workers are likely to be local residents and as such already part of the community social structures and family networks.

Box 1.3 describes the impact of increased social ills during the construction phase.

Box 1.3 Construction Impact: Increased Social Ills

Nature: The social ills likely to accompany the Project would be regarded as an **indirect, negative** impact. Livestock theft is likely to increase as a result of impoved road access and increased activity on the farms. Social ills such as drug and alcohol abuse as well as petty crime may increase due to increased disposable income.

Impact Magnitude – Medium

- **Extent:** It is anticipated that the potential social ills will have impacts at the **local** scale.
- **Duration:** The social ills likely to accompany the proposed project are expected to be **short-term,** for the duration of the construction phase of the project.
- **Intensity:** The intensity will be **high** as people may struggle to adapt in relation to stock theft as well as other social ills.

Likelihood – It is **likely** that this impact will occur during the construction phase.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MODERATE NEGATIVE

Degree of Confidence: The degree of confidence is **medium** given that the extent of the influx of job-seekers is unknown.

Operation Phase Impacts

During the operational phase, there are going to be a limited number of workers (122) and/or contractors on site. As such, it is unlikely that there will be any social ills linked to the project activities.

Stock theft will probably decrease dramatically in the operation phase as farmers would have taken necessary steps to curb stock theft. The improved access roads will continue to ease access to the farms for the duration of the lifespan of the project.

Box 1.4 describes the impact of increased social ills during the operation phase.

Box 1.4 Operational Impact: Increased Social Ills

Nature: The social ills (including stock theft) likely to accompany the proposed project would be regarded as an **indirect, negative** impact.

Impact Magnitude –Low

- **Extent:** It is anticipated that the potential social ills and stock theft will have impacts at the **local** scale.
- **Duration:** The social ills likely to accompany the proposed project are expected to be **temporary**.
- **Intensity:** The intensity will be **Low** as people should be able to adapt with relative ease.

Likelihood – It is **likely** this impact will occur during the operation phase.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **medium** given that the extent of the influx of job-seekers is unknown.

1.2.2 Mitigation

The objectives of mitigation are:

- to limit, where possible, social ills brought about by the construction and operation of the wind farm; and
- to ensure that Contractors manage their workers in such a way that the impacts on local communities are limited.

Specific measures include:

- G7 and its appointed contractors to develop an induction programme, including a Code of Conduct, for all workers (G7 and contractors including their workers) directly related to the project. A copy of the Code of Conduct to be presented to all workers and signed by each person.

- The Code of Conduct must address the following aspects:
  - respect for local residents;
  - respect for farm infrastructure and agricultural activities;
  - no hunting or unauthorised taking of products or livestock;
  - zero tolerance of illegal activities by construction personnel including: unlicensed prostitution; illegal sale or purchase of alcohol; sale, purchase or consumption of drugs; illegal gambling or fighting;
  - compliance with the Traffic Management Plan and all road regulations; and
  - description of disciplinary measures for infringement of the Code and company rules.

- If workers are found to be in contravention of the Code of Conduct, which they signed at the commencement of their contract, they will face

disciplinary procedures that could result in dismissal. Stock theft should be noted as a dismissible offence.

- G7 will implement a grievance procedure that is easily accessible to local communities, through which complaints related to contractor or employee behaviour can be lodged and responded to. G7 will respond to all such complaints. Key steps of the grievance mechanism include:
  - circulation of contact details of 'grievance officer' or other key G7 contact;
  - awareness raising among local communities (including all directly affected and neighbouring farmers) regarding the grievance procedure and how it works; and
  - establishment of a grievance register to be updated by G7, including all responses and response times.

- G7 and its contractors will develop and implement an HIV/AIDS policy and information document for all workers directly related to the project. The information document will address factual health issues as well as behaviour change issues around the transmission and infection of HIV/AIDS. G7 will make condoms available to employees and all contractor workers.

- The construction workers (from outside the area) should be allowed to return home over the weekends or on a regular basis to visit their families; the contractor should make the necessary arrangement to facilitate these visits.

1.2.3 Residual Impact

The implementation of the above mitigation measures ensure that the construction impacts decrease from moderate to minor significance, and the operation impacts reduce from minor to negligible significance. The pre- and post-mitigation impacts are compared in *Table 1.4*.

Table 1.4 Pre- and Post- Mitigation Significance: Increased Social Ills

Phase	Significance (Pre-mitigation)	Residual Impact Significance
Construction	**MODERATE Negative**	**MINOR Negative**
Operation	**MINOR Negative**	**LOW Negative**

1.3 DISRUPTION TO AGRICULTURAL ACTIVITIES

1.3.1 Impact Description and Assessment

The primary activity is sheep farming but some farmers also practice crop farming such as onion seeds, onions, lucerne (alfalfa), and oats, depending on the availability of water on the individual farms. The Roggeveld site is predominantly a winter rainfall area, as such; farmers keep their sheep on the Roggeveld farm during the winter months and move them during the

summer months. Where a landowner only has land within the Roggeveld area, the sheep are rotated between the farms/camps as dictated by water availability and the condition of the vegetation on the individual farms. The individual camps on each farm are fenced off and gated in order to manage the grazing impact in a particular area.

Table 1.5 below provides a summary of the disruption to agricultural facilities impact at the construction and operational phases of the proposed project as well as an indication of the stakeholders that may be affected.

Table 1.5 Impact Characteristics: Disruption to Agricultural Activities

Summary	Construction	Operation
Project Aspect/ activity	Construction activities. Access through farm gates. Employment of local workers.	Operation activities. Access through farm gates.
Impact Type	Direct, negative impact.	Direct, negative impact.
Stakeholders/ Receptors Affected	Directly affected farmers, and neighbouring farmers.	Directly affected farmers, and neighbouring farmers.

Construction Phase Impacts

During the construction phase, there will be considerable disruption to agricultural activities. Construction phase activities include site clearance, road construction, assembly and installation of wind turbines, as well as the construction of associated infrastructure.

During construction, the farmers will need to keep their livestock in alternate camps to the construction area in order to ensure that the stock are not harmed or lost as a result of the intensive construction activities.

As mentioned above and in greater detail in the Socio-Economic Baseline *Section 6*, the farms are divided into camps and in order to access the full proposed project site it will be necessary for the construction team to travel between camps; requiring them to open and close gates as they move. They will, at times, also be required to travel across/alongside neighbouring farms to reach the selected sites. It is critical that the gates are always closed once the team has passed in order to secure the stock.

The high traffic volumes of light and heavy vehicles that will be passing through the farm camps are likely to cause damage to the gates and fencing. Any damage to this infrastructure could also lead to stock losses.

Box 1.5 describes the impact of disruption to agricultural activities during the construction phase

Box 1.5 Construction Impact: Disruption to Agricultural Activities

Nature: The disruption to agricultural activities would be regarded as a **direct, negative** impact.

Impact Magnitude – Medium

- **Extent:** It is anticipated that the disruption to agricultural activities will be experienced at the **local** level.
- **Duration:** The disruptions will be experienced during the construction phase and as such will be **short-term**.
- **Intensity:** The intensity will be **medium** as the farmers will have some difficulty adapting to the disruption without some degree of support and compromise.

Likelihood – This impact will **definitely** occur during the construction phase.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MODERATE NEGATIVE

Degree of Confidence: The degree of confidence is **high.**

Operation Phase Impacts

The disruption of farm activities during the operational phase is going to be significantly less. There will be substantially fewer vehicles on site and the stock will not be limited to the camps that are unaffected by the proposed project. During operation, the stock will be able to graze in all the camps as the proposed project activities will not affect their ability to graze. As with the construction phase, access to the site will be through a range of gates that separates farms and camps and it is imperative that operational staff be vigilant in closing gates in order to protect against stock losses.

Box 1.6 describes the impact of disruption to agricultural activities during the operational phase.

Box 1.6 Operational Impact: Disruption to Agricultural Activities

Nature: The disruption to agricultural activities would be regarded as a **direct, negative** impact.

Impact Magnitude – Low

- **Extent:** It is anticipated that the disruption to agricultural activities will be experienced at the **local** level.
- **Duration:** The disruptions will be experienced throughout the operation phase and as such will be **long-term**.
- **Intensity:** The intensity will be **low** as the farmers will be able to adapt with relative ease during the operational phase.

Likelihood – It is **likely** that this impact will occur during the operational phase.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **high.**

1.3.2 *Mitigation*

The objective of mitigation is to minimise the disruption to agricultural activities as related to the construction and operational phase activities.

Specific measures include:

- Construction schedule should be determined in consultation with individual farmers such that they have forewarning to adapt farming practises and minimise disturbances. Given the area is predominantly used during the winter months it may be preferential to farmers if the schedule could take this into account.

- All workers will agree to the Code of Conduct and be aware that contravention of the Code could lead to dismissal (as outlined in *Section 1.2*).

- All directly affected and neighbouring farmers will be able to lodge grievances with G7 using the Grievance Procedure as outlined in *Section 1.2*.

1.3.3 *Residual Impact*

The implementation of the above mitigation measures would reduce the construction impacts from moderate to minor significance and the operation impacts from minor to negligible. The pre- and post-mitigation impacts are compared in *Table 1.6* and ***Error! Reference source not found.***.

Table 1.6 Pre- and Post- Mitigation Significance: Disruption to Agricultural Activities

Phase	Significance (Pre-mitigation)	Residual Impact Significance
Construction	**MODERATE Negative**	**MINOR Negative**
Operation	**MINOR Negative**	**NEGLIGIBLE Negative**

1.4 *LOSS OF AGRICULTURAL LAND*

1.4.1 *Impact Description and Assessment*

Currently, there are three relevant pieces of legislation that apply to the change of land use; they are the Land Use and Planning Ordinance (Ordinance 15 of 1985) (LUPO), the Western Cape Planning and Development Act No 7 of 1999 and the Subdivision of Agricultural Land Act No 70 of 1970. DEA&DP is currently discussing the need to update LUPO in the face of numerous renewable energy facilities being proposed for development in the Western Cape Province (1). The Department is reviewing the suitability of the current 'land departure' application for changes in land use from agriculture to an increasingly greater number of renewable energy facilities. There is a

(1) Personal comms. with Doretha Kotze, WCDM, June 2010.

possibility that a new section will be added to the ordinance that will address land rezoning and land departures to accommodate wind facilities. To date, no amendments have been made to LUPO.

In addition, an intergovernmental meeting was held in October 2010 by the Department of Energy, National Department of Agriculture Forestry and Fisheries (DAFF) and the South African Wind Energy Association to discuss guidelines for the regulation of wind farm uptake of agricultural land. The new draft guidelines state the following: No wind farming structures, its foot print, service area, supporting infrastructure or access routes in any form or for any purpose will be allowed:

- On high potential or unique agricultural land as has been determined or identified by DAFF or the relevant provincial Department of Agriculture through its existing or future developed spatial information data sets and /or through a detail agricultural potential survey.

- On areas currently being cultivated (cultivated fields/ production areas) or on fields that have been cultivated in the last ten years. This is relevant to cultivated land utilised for dry land production as well as land under any form of irrigation.

- To intervene with or impact negatively on existing or planned production areas (including grazing land) as well as agricultural infrastructure (silos, irrigation lines, pivot points, channels, feeding structures, dip tanks, grazing camps, animal housing, farm roads etc).

- To result in a degradation of the natural resource base of the farm or surrounding areas. This include, but are not limited to, the limit of soil degradation or soil loss through erosion or any manner of soil degradation, the degradation of water resources (both quality and quantity) and the degradation of vegetation (composition) and condition of both natural or established vegetation.

Table 1.7 provides a summary of the loss of agricultural land impact at the construction and operation phases of the proposed project as well as an indication of the affected stakeholders.

Table 1.7 Impact Characteristics: Loss of Agricultural Land

Summary	**Construction and Operation**
Project Aspect/ activity	Land take for the construction and operation of facility.
Impact Type	Direct, negative impact.
Stakeholders/ Receptors Affected	Directly affected land owners, Local, Provincial and National Government.

Construction and Operation Phase Impacts

The construction and operation of the proposed wind farm will require that approximately two to three percent of the identified land parcel/s will be taken for the construction and operation of the wind farm.

The damage to vegetation as a result of construction activities was one of the key concerns land owners expressed. Despite supplementing grazing, farmers rely heavily on natural grazing vegetation. The natural vegetation is sensitive to disturbance and damage to it will have long-lasting impacts.

Box 1.7 Construction and Operation Impact: Loss of Agricultural Land

Nature: The impact on agricultural land is going to be experienced as a **direct, negative** impact.

Impact Magnitude – Low

- **Extent:** The impact on agricultural land resulting from the construction and operation activities will occur at the **local/regional** level.
- **Duration:** This impact will occur for the duration of the construction and operation phases and will therefore be **long-term**.
- **Intensity:** The intensity will be **low** as limited agricultural land will be lost.

Likelihood – This impact will **definitely** occur.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **high**.

1.4.2 Mitigation

The objective of mitigation is to minimise the loss of agricultural land resulting from project related activities during construction and operational phases.

Specific measures include:

- G7 to design the infrastructure layout in a manner that limits the footprint of the facility and all associated infrastructure.
- G7 should provide the farmers with GPS coordinates of the areas that will be affected such that farmers can actively monitor affected areas.
- G7's Community Development Fund will seek to increase the extent of farming or the intensity of farming practice in order to counter the effects of land loss.
- G7 to minimise the damage caused by construction activities to the farmland by ensuring strict compliance with construction plans and worker 'Code of Conduct'.

- Any damage to vegetation will be rehabilitated in accordance with mitigation proposed for the rehabilitation of natural vegetation in *Section 7*.

1.4.3 Residual Impact

The implementation of the above mitigation measures would ensure that the construction and operation impacts remain of minor significance. The pre- and post-mitigation impacts are compared in *Table 1.8*.

Table 1.8 Pre- and Post- Mitigation Significance: Loss of Agricultural Land

Phase	Significance (Pre-mitigation)	Residual Impact Significance
Construction and Operation	**MINOR Negative**	**MINOR Negative**

1.5 TOURISM ACTIVITIES

1.5.1 Impact Description and Assessment

The tourism sector is reported to have experienced growth although the tourism activities in close proximity to the site are limited. The tourist attractions in the areas mainly relate to heritage and natural beauty of the area. The arterial road, R354 is an important scenic and tourist route. *Table 1.9* provides a summary of the impact on tourism activities art the construction and operational phase of the project as well as an indication of the affected stakeholders.

Table 1.9 Impact Characteristics: Tourism Activities

Summary	Construction	Operation
Project Aspect/ activity	Construction of the wind farm.	Operation of the wind farm.
Impact Type	Direct, negative impact	Direct, positive impact.
Stakeholders/ Receptors Affected	Directly affected landowner, neighbouring landowners (including 'lifestyle farmers'), road users, and interested people.	Tourists to the area, directly affected landowners, neighbouring landowners (including 'lifestyle farmers'), road users, and interested people.

General Discussion

There have been relatively few wind energy facilities in developing countries and certainly no studies reviewing the impacts of wind energy facilities on the local communities, economy or tourism in developing countries. As such, we rely heavily on learnings from research that has been undertaken in developed countries. There are numerous wind energy facilities in developed countries that have used the technology for a relatively long period of time and have been able to reflect upon some of the impacts caused by these facilities. In South Africa, there are currently two wind farms, one is located in Darling, which was commissioned by the government in 2002 and the other is a demonstration facility in Klipheuwel near Durbanville in the Western

Cape Province. The Darling Wind Farm is a small facility consisting of only four turbines. There has not been much information shared with the public in terms of the wind farms' impacts on the surrounding communities, economy or tourism. This assessment is, therefore, based primarily on studies undertaken in developed countries as well as input from interviewees.

The indirect effects of wind farms on tourism have been the subject of substantial debate, but no evidence has been presented to support the view that wind farms have a negative effect on tourism. Results from numerous surveys demonstrate that the effect of wind farms on tourism is negligible at worst, with many respondents taking a positive view to wind farms, and saying it would not affect their likelihood of returning to an area [(1)] . A study by Glasgow Caledonian University, looking into the impacts of wind farms on Scottish tourism, found that 75 percent of tourists surveyed felt that wind farms had a positive or neutral impact on the landscape [(2)].

The evidence supporting the impacts of wind farms on tourism is, however, contradictory. There are studies (based in Scotland) that provide conflicting findings about actual and perceived impacts. *Box 1.8* presents some contradictory findings related to the Scottish experience.

Box 1.8 Scottish Findings Regarding the Impacts of Wind Facilities

- VisitScotland commissioned independent research on the potential impacts of the development of wind farms on tourism in Scotland. This study concluded that 29 percent of respondents felt that wind farms and turbines had detracted from their experience [(3)] and 31 percent of respondents considered that the scenery and landscape would be spoiled by wind farm developments.

- In contrast a poll carried out by MORI Scotland found that 91 percent of respondents said that the presence of wind farms in the area made no difference to whether they would return (4). In a similar survey carried out for the Scottish Executive of people living close to wind farms, MORI Scotland found that most people felt that wind farms had had neither a positive or negative impact on their area. Of the remainder, 20 percent said it had had a broadly positive impact and 7 percent thought that there was a negative impact [(5)]. In Cornwall, wind farms have provided a unique visitor attraction and in addition they act as an invaluable educational facility for renewable energy.

According to other studies undertaken in the United Kingdom, Scotland and Australia by the respective Wind Energy Agencies [(6)], tourism has not been negatively affected by the establishment of wind energy facilities. Surprisingly, in contrast, wind energy facilities have been credited with increasing tourism activities and in turn also positively impacting on the local economy [(7)].

(1) BWEA (2006) The Impact of Wind Farms on the Tourist Industry in the UK.
(2) Glasgow Caledonian University (2007). The Economic Impacts of Wind Farms on Scottish Tourism. Report commissioned by the Scottish Government.
(3) NFO System Three, Investigation into the Potential Impact of Wind Farms on Tourism in Scotland - Final Report.
(4) MORI (2002) Tourist Attitudes Towards Wind Farms. Research Study Conducted for Scottish Renewables Forum & the British Wind Energy Association.
(5) MORI (2003) Public Attitudes to Wind Farms, Scottish Executive Energy Policy Unit.
(6) BWEA (2006) Impact of Wind Farms on Tourist Industry in the UK and AusWEA (2003) Wind Farms and Tourism
(7) http://www.offorsharp.com/downloads/baldhillseconomic.pdf

Experience in Scotland has shown that people are fascinated by wind turbines and often travel via the wind energy facilities *en route* to their final destinations. As a result, the construction of new wind energy facilities often includes the construction of a lay-by area so that passing traffic can park safely in order to view the turbines. Many recent planning applications have been modified by the developers to incorporate a viewing platform and visitor centre or information boards in order to maximise on the tourism potential of the project (1).

Some relevant positive experiences associated with selected wind energy facilities are provided in *Box 1.9*.

Box 1.9 Relevant Experiences of Selected Wind Energy Facilities

- **Altahullion Wind Facility** (Dungiven, Ireland) - local community groups requested tourist facilities at the site because of the influx of people visiting the facility. Developers persuaded the department of environmental service to provide tourist signage to guide visitors from the main road to the site. The site has a car park and specially designated turbine which people can walk to.

- **Beinn and Tuirc Wind Facility** (Argyll, Scotland) - this wind farm has established an open day where visitors can come visit the site. The site is so popular that the local government has been investigating the possibility of introducing a new bus route to take visitors to visit the facility.

- **Albany Wind Facility** (Albany, Western Australia) – this facility is considered by many to be a wonderful tourism attraction, so much so that it has been featured on television's Great Outdoors Show. Planning is underway for a Wind Discovery Centre at the Albany Wind Farm, with the aim of building a world class centre to attract additional tourists to the Albany region. According to the city's economic development statistics, traffic counters suggest about 100,000 people visited the wind facility last year (2005). The site is located near the ocean and the communities and fishermen have not complained about it as a deterrent.

Construction Phase Impacts

The construction of the wind farm will result in noise, visual, traffic and a changed the sense of place. These factors are unlikely to have a significant impact on tourism in the area due to the proximity of the site to tourist facilities in the affected local municipalities. *Box 1.10* below describes the negative impact on tourism activities at the construction phase.

(1) Tim and Carmel Brady (2003) Wind Farms and Tourism, AusWEA,

Box 1.10 Construction Impact – NEGATIVE Tourism Activities

Nature: The impact on tourism activities could be experienced as a **direct, negative** impact by tourists using the arterial road R354 and the subsequent loss to the scenic value of some places along the route.

Impact Magnitude – Low

- **Extent:** The impacts on tourism linked to the construction activities will occur at the **local** level.
- **Duration:** This impact will occur throughout the construction phase, and will therefore be **temporary**.
- **Intensity:** The intensity will be **low** as those who are directly affected will be able to adapt with relative ease.

Likelihood – It is **likely** that this impact will occur during the construction phase.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **medium** given that there are no recorded experiences relating to similar developments in South Africa or other developing countries.

Operation Phase Impacts

Operation of the wind farm is not predicted to have a generally negative impact on tourism-related activities in the area. Given that Renewable Energy Facilities are so new in South Africa, it is anticipated that people will travel to the site in order to view a development that has not yet been seen in our country (with the exception of the Darling Wind Farm that does not compare to the proposed Project in terms of scale and technology). It is most likely that the proposed project will have a positive impact in terms of attracting interest from passing travellers and interested people. Given the lack of information, it is not known how long this will remain an attraction.

The site is located alongside the R354 arterial road and is fairly isolated from tourist attractions such as the heritage site Village of Matjiesfontein and the Tankwa Karoo National Park. The visual impact assessment (See *Section 12*) notes that the wind farm will be highly visible from the R354 which is an important tourist route, with a high scenic value in places. There are no tourism facilities on the proposed project site, but land owners have mentioned the development of tourism activities as one their expansion plans.

The area is valued by the 'lifestyle farmers' who own neighbouring farmland; they use their farms for recreational purposes, conservation and as a peaceful escape from the city (this is discussed further in *Section* 1.7 that addresses the impacts on 'Sense of Place'). *Box 1.11* below describes the positive impact on tourism activities at the operational phase.

Box 1.11 Operational Impact - POSITIVE: Tourism Activities

Nature: The impact on tourism activities is most likely going to be a **direct, positive** impact for most receptors. It will, however be experienced as a **direct, negative** impact by 'lifestyle farmers' who use their farms for tourism and some tourists that will not value the change to the area (impact assessment presented in *Box 1.12*).

Impact Magnitude – Low

- **Extent:** The impacts on tourism linked to the operational activities will occur at the **local** level.
- **Duration:** This impact will occur throughout the operational phase, and will therefore be **long-term**.
- **Intensity:** The intensity will be **medium** as those who are directly affected will experience positive impacts that they will adapt to a benefit from directly.

Likelihood – It is **likely** that this impact will occur during the operational phase. The likelihood rating is influenced by the positive international experience.

IMPACT SIGNIFICANCE (PRE-ENHANCEMENT) – MINOR POSITIVE

Degree of Confidence: The degree of confidence is **medium** given that there are no recorded experiences relating to similar developments in South Africa or other developing countries

Box 1.12 below describes the negative impact on tourism activities at the operational phase.

Box 1.12 Operational Impact - NEGATIVE: Tourism Activities

Nature: The impact on tourism activities could be experienced as a **direct, negative** impact by 'lifestyle farmers' who will not value the change to the area. It is, however, most likely going to be a **direct, positive** impact for most receptors (impact assessment presented in *Box 1.11*).

Impact Magnitude – Medium

- **Extent:** The impacts on tourism linked to the operational activities will occur at the **local** level.
- **Duration:** This impact will occur throughout the operational phase, and will therefore be **long-term**.
- **Intensity:** The intensity will be **medium** as those who are directly affected will be able to adapt with some difficulty. No significant tourist sites currently exist in the immediate area and the site.

Likelihood – It is **unlikely** that this impact will occur during the operational phase. This rating is largely based on perceptions/ feedback of some directly affected and interested stakeholders.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **medium** given that there are no recorded experiences relating to similar developments in South Africa or other developing countries.

1.5.2 Mitigation

The objective of mitigation is to enhance the positive impacts and minimise the negative impacts of the wind farm on tourism activities in the area.

Specific measures include:

- Apply all mitigation measures to reduce the noise and visual impacts as presented in *Sections 12* and 13).

- G7 will work with the Local Municipality and local tourism organisations to raise awareness about the wind farm.

- G7 will establish an information kiosk/notice board on the site boundary or entrance to facilitate educating the public about the need and benefits of project. This is aimed at instilling the concept of sustainability and creating awareness by engaging the community and local schools. Information brochures and posters will be made available at the kiosk to provide more information about the facility. These should be presented in the appropriate languages to maximise the benefits.

1.5.3 Residual Impact

The implementation of the above mitigation measures should enhance the positive operational impacts from minor to moderate (positive) significance and the negative operation impacts from minor to negligible (negative) significance. The pre- and post-mitigation impacts are compared in *Table 1.10*.

Table 1.10 Pre- and Post- Mitigation Significance: Tourism Activities

Phase	Significance (Pre-mitigation)	Residual Impact Significance
Construction NEGATIVE	**MINOR Negative**	**NEGLIGIBLE Negative**
Operation POSITIVE	**MINOR Positive**	**MODERATE Positive**
Operation NEGATIVE	**MINOR Negative**	**NEGLIGIBLE Negative**

1.6 PROPERTY PRICES AND DESIRABILITY OF PROPERTY

1.6.1 Impact Description and Assessment

There are relatively few wind farms in developing countries and certainly no studies reviewing the impacts of wind farms on property prices in developing countries. As such, we rely heavily on learning's from research that has been undertaken in developed countries.

Table 1.11 provides a summary of the impact on property prices and desirability for the construction and operation phases of the proposed project as well as an indication of the stakeholders that may be affected.

Table 1.11 Impact Characteristics: Property Prices and Desirability of Property

Summary	Construction and Operation
Project Aspect/ activity	Existence and Operation of the wind farm.
Impact Type	Direct, negative impact (for neighbouring landowners). Direct, positive impact (for directly affected landowners).

Summary	Construction and Operation
Stakeholders/ Receptors Affected	Neighbouring property owners and directly affected landowners.

Construction and Operation Phase Impacts

According to personal communication with a property evaluator from the Land Bank (1), it is believed that the market value of the directly affected farms will increase because of the increased revenue generated from the wind turbines. Depending on the amount of land used for the development, the production value (burden that the property can carry) of the farms is likely to remain the same for the directly affected farms and the neighbouring farms. Farm values are primarily calculated according to the production value and farm infrastructure. The directly affected landowners will be receiving a steady income from leasing a portion of the farm.

There is often an assumption that the presence of wind farms in an area has a negative impact on nearby property prices. There is, however, little evidence to support this assumption. Given that there are no large-scale fully operational wind facilities in South Africa, we have to rely on international research that has been undertaken in terms of the value of property prices in relation to wind energy facilities. *Box 1.13* presents some of these findings.

(1) Personal Comms, Mr Riaan Veragie, Beaufort West Land Bank, July 2010.

Box 1.13 International Research: Relationship between Wind Farms and Property Prices

In Scotland, research from the Edinburgh Solicitors' Property Centre (ESPC) (1) considered property sales near Crystal Rig in the Scottish Borders and found no evidence of a negative effect on the price of property in nearby areas. The ESPC study found that prices in the village of Dunbar had risen from below to above the regional average during the previous four years, during which time the wind farm was built, and that since the wind farm began operating, property price inflation in Dunbar had continued to exceed that achieved across East Lothian.

Reports from the Royal Institute of Chartered Surveyors (RICS) in 2003 (2) and December 2007 (3) suggest that wind farm development may impact negatively on property prices to some extent. Any impact is most likely to be active during the planning application stage in the development and appears to decline over time. The results were based upon a relatively low number of surveyors who have worked on property near wind farm developments.

A significant number (40 percent) of surveyors reported 'no impact from wind farm developments on residential property values' (RICS, 2003 & 2008).

There is still uncertainty and significant variability regarding house price data with low numbers of housing and few associated sales within the region of proposed developments to form succinct conclusions.

There is no evidence to suggest that wind turbines have a long-term significant effect on the local property market.

A study was undertaken by Poletti and Associates for Invenergy Wind LLC in the states of Wisconsin and Illinois, USA. The aim of the study was to compare sales of homes and farming properties within an area close to wind energy facilities to other properties (with similar characteristics) in an area far from wind energy facilities (4). The study looked at property sales from 1998 through to 2006. The results of the studies were:

- Area 1 which was located in Wisconsin had two operational wind farms active since 1998. The results indicated that there were no measurable differences in home values in close proximity to the facility to those located further away from the wind farm (5). These results were based on the analysis of 87 residential and farmland sales for the areas.

- Area 2, located in the state of Illinois had one wind farm which had been operating since 2003. The analysis of 69 residential and farmland property sales revealed that there were no measurable difference in the home values

(1) Edinburgh Solicitors Property Centre (ESPC) (2007), Impact of Wind Farms on Residential Property Prices – Crystal Rig Case Study, February 2007.
(2) The Royal Institute of Chartered Surveyors (RICS) (2003), Impact of wind farms on the value of residential property and agricultural land, http://www.rics.org/NR/rdonlyres/66225A93-840F-49F2-8820-0EBCCC29E8A4/0/Windfarmsfinalreport.pdf
(3) RICS (2008), Modelling the Impact of wind Farms on House Prices in the UK, accessed at http://www.rics.org/NR/rdonlyres/B3E3D771-F5E9-4298-AD19-5B507695EF43/0/DentandSims.pdf
(4) A Real Estate Study of the Proposed White Oak Wind Energy Centre, McLean and Woodford Counties, Illinois, January 2007. http://amherstislandwindinfo.com/propertyvaluestudy.pdf
(5) A Real Estate Study of the Proposed White Oak Wind Energy Centre; McLean and Woodford Counties, Illinois, January 2007. http://amherstislandwindinfo.com/propertyvaluestudy.pdf

between the area close to a wind farm and the area further away from a wind farm [1].

A follow up investigation in 2007 of the same two study areas was conducted. The investigation revealed that the property prices continued to increase and the local government had approved the construction of new houses in the area close to the wind farm. These new houses were selling very well and fast.

It is very difficult to apply the findings of these studies to the South African context. The lessons learnt internationally can provide us with some understanding of what might happen but the reality is that we cannot be certain. The assessment of this impact is conservative given the high level of uncertainty.

The presence of lifestyle farming in the Project area has caused the property values to increase and in some cases the size of the land parcels to decrease. Given the tough farming conditions, many farmers were forced to sell portions of their farms for additional income. The demand by 'lifestyle farmers' for land and the development of new infrastructure has resulted in increased land prices; however, the agricultural value of the land has generally remained the same.

The introduction of the wind farms will cause a dramatic increase in the value of the directly affected farms. It is not clear exactly how the wind farm will affect the neighbouring farms but it is unlikely to change the value of the land from an agricultural perspective. It is possible that the land will be less attractive to 'lifestyle farmers'; however, the research has shown that property prices will continue to increase despite the presence of the wind farm.

Box 1.14 describes the construction and operational impact on property priced and the desirability of the property.

(1) A Real Estate Study of the Proposed White Oak Wind Energy Centre; McLean and Woodford Counties, Illinois, January 2007. http://amherstislandwindinfo.com/propertyvaluestudy.pdf

Box 1.14 Construction and Operational Impact: Property Prices and Desirability of Property

Nature: The impact on property prices is going to be experienced as a **direct, negative** impact on indirectly affected properties initially. It is not certain how this will change over time. *

Impact Magnitude – Low

- **Extent**: The impact on property prices resulting from the operation of the wind farm will occur at the **local** level.
- **Duration**: This impact will occur for the duration of the operation phase and will therefore be **long-term**.
- **Intensity**: The intensity will be **low** as research shows that there is unlikely to be a decrease in property prices.

Likelihood – It is **likely** that this impact will occur.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **low** given the high levels of uncertainty and lack of South Africa specific information.

* *The directly affected farms are likely to experience a direct, positive impact - this has not been assessed given that their contracts with G7 and the associated benefits are private. All pros and cons of the proposed development would have been considered in a private capacity.*

1.6.2 Mitigation

The objective of mitigation is to minimise the negative impacts on property prices.

Specific measures include:

- G7 to design the infrastructure layout in a manner that limits the footprint of the facility and all associated infrastructure.
- Apply all mitigation measures to reduce the noise and visual impacts as presented in *Sections 12* and 13.
- Prepare a site Rehabilitation Plan that will be implemented as part of the decommissioning phase.
- All directly affected and neighbouring farmers will be able to lodge grievances with G7 using the Grievance Procedure as outlined in *Section 1.2*.

1.6.3 Residual Impact

The implementation of the above mitigation measures should ensure that the significance rating remains one of minor significance during the construction/operation phases. The pre- and post-mitigation impacts are compared in *Table 1.12.*

Table 1.12 Pre- and Post- Mitigation Significance: Property Prices and Desirability of Property

Phase	Significance (Pre-mitigation)	Residual Impact Significance
Construction and Operation	**MINOR Negative**	**MINOR Negative**

1.7 SENSE OF PLACE

1.7.1 Impact Description and Assessment

The proposed project site at Roggeveld is located in an area that is relatively undisturbed. It lies alongside an Arterial Road (R354), between Matjiesfontein and Sutherland. The farm is rural and isolated in parts. The farm is neighboured by 'lifestyle farmers' who place a high value on the peaceful nature of the area; they use their farms for recreational purposes and as a peaceful escape from the city.

Wind farms and their associated infrastructure can change the visual and acoustic character of an area by introducing large-scale structures and machinery into previously undeveloped areas, particularly in rural areas. This includes the wind turbines themselves, as well as electrical transmission lines, sub-station, maintenance staff, vehicles and maintenance equipment.

Table 1.13 provides a summary of the impact on the sense of place for the construction and operation phases of the proposed project as well as an indication of the stakeholders that may be affected.

Table 1.13 Impact Characteristics: Sense of Place

Summary	Construction	Operation
Project Aspect/ activity	Clearing and stripping of vegetation and topsoil for construction of proposed project infrastructure. Increased traffic. Visual and noise disturbances. Influx of workers and job-seekers.	Operation of wind farm and associated infrastructure - visibility of built structures, lighting, noise, operational traffic. Traffic slowing resulting from people looking at the facility.
Impact Type	Direct, negative impact (as related to project activities). Indirect, negative impact (as related to non-project activities e.g. influx of workers and jobseekers).	Direct, negative impact (as related to project activities). Indirect, negative impact (as related to non-project activities e.g. traffic slowing).
Stakeholders/ Receptors Affected	Directly affected landowners, neighbouring landowners (including 'lifestyle farmers'), local communities, tourists, and drivers passing on the Arterial Road (R354).	Directly affected landowners, neighbouring landowners (including 'lifestyle farmers'), local communities, tourists, and drivers passing on the Arterial Road (R354).

Construction Phase Impacts

During the construction phase, there will be a significant increase in the number of people (workers), noise generated, visual disturbances and traffic resulting directly resulting from the construction activities. It is likely that there will also be an increase in the number of people as a result of an influx of job-seekers.

These factors are going to further disturb the area alongside the arterial road. The R354 is the primary access route to the site used by local farmers and construction phase activities will substantially increase the traffic volume in the area. The relative speeds of road users compared to heavy construction vehicles could pose a risk to increase road accidents in the area. The construction period is limited in time; as such, these disturbances should not continue for longer than 12 to 24 months. *Box 1.15* describes the construction impact on sense of place.

Box 1.15 Construction Impact: Sense of Place

Nature: The impact on sense of place is most likely going to be experienced as a **direct, negative** impact by the affected stakeholders.

Impact Magnitude – Low

- **Extent:** The impact on sense of place linked to the construction activities will occur at the **local** level.
- **Duration:** This impact will occur for the duration of the construction phase, approximately 12 to 24 months, and will therefore be **short-term**.
- **Intensity:** The intensity will be **low** as those who are directly affected will be able to adapt with relative ease; they are willingly participating in the proposed project.

Likelihood – It is **likely** that this impact will occur during the construction phase.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **high**.

Operation Phase Impacts

Given the relatively undisturbed area in which the proposed project will be located, there were concerns raised regarding the visual and noise impacts related to the facility. Concerns were raised by directly affected land owners as well as selected groups of stakeholders who do place a high value on the land, namely neighbouring landowners (most notably the 'lifestyle farmers').

The majority of receptors are unlikely to experience disruptions to the sense of place as they are located relatively far from the proposed project site. Those receptors that are passing through the area are mostly likely going to value the experience of viewing the wind farm en route to other destinations. The visual impact assessment (See *Section 12)* notes that the sheer size of the

facility will add to the impact to the sense of place. *Box 1.16* describes the operational impact on sense of place.

Box 1.16 Operational Impact: Sense of Place

Nature: The impact on sense of place is most likely going to be experienced as a **direct, negative** impact by the directly affected stakeholders.

Impact Magnitude – Medium

- **Extent:** The impact on sense of place linked to the operation activities will occur at the **local** level.
- **Duration:** This impact will occur for the duration of the operation phase and will therefore be **long-term**.
- **Intensity:** The intensity will be **high** for the small number of receptors who value the peaceful nature of the area as it will be difficult for them to adapt to the change. For the remainder of the stakeholders, the intensity will be negligible.

Likelihood – It is **definite** that this impact will occur during the operation phase.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MODERATE NEGATIVE

Degree of Confidence: The degree of confidence is **high**.

1.7.2 Mitigation

The objective of mitigation is to minimise, wherever possible, the impacts on sense of place by ensuring that all visual and noise impacts (amongst others) are addressed during construction and operation.

Specific measures include:

- Apply all mitigation measures to reduce the visual and noise impacts as presented in *Sections 12* and 13.
- The construction activities will be undertaken in accordance with a schedule that will be approved by the landowners.
- All workers will agree to the Code of Conduct and be aware that contravention of the Code could lead to dismissal (as outlined in *Section 1.2*).
- All directly affected and neighbouring farmers will be able to lodge grievances with G7 using the Grievance Procedure as outlined in *Section 1.2*.

1.7.3 Residual Impact

The implementation of the above mitigation measures would reduce the construction impacts from minor to negligible significance and the operation

impacts from moderate to minor negative significance. The pre- and post-mitigation impacts are compared in *Table 1.14.*

Table 1.14 Pre- and Post- Mitigation Significance: Sense of Place

Phase	Significance (Pre-mitigation)	Residual Impact Significance
Construction	**MINOR Negative**	**NEGLIGIBLE Negative**
Operation	**MODERATE Negative**	**MINOR Negative**

1.8 ROAD INFRASTRUCTURE (1)

1.8.1 Impact Description and Assessment

The site straddles the Northern Cape and Western Cape Provinces. It is located approximately 40km south of Sutherland and approximately 20km north of Matjiesfontein; it is accessed from the R354 arterial road.

Table 1.15 provides a summary of the impact on the infrastructure for the construction and operation phases of the proposed project as well as an indication of the stakeholders that may be affected.

Table 1.15 Impact Characteristics: Road Infrastructure

Summary	Construction	Operation
Project Aspect/ activity	Construction activities, including the transport of abnormal loads by heavy vehicles. Upgrade of construction roads and construction of new roads to enable access to proposed project site.	Operation activities, including site inspection, maintenance and repairs. Road maintenance.
Impact Type	Direct (as linked to project activities). Indirect (as linked to increased road users).	Direct (as linked to project activities). Indirect (as linked to increased additional road users).
Stakeholders/ Receptors Affected	Current road-users, most notably the directly affected landowners, the neighbouring landowners, farm workers and service providers.	Current road-users, most notably the directly affected landowners, the neighbouring landowners, farm workers and service providers.

Construction Phase Impacts

The construction of the proposed wind farm and associated infrastructure will increase the amount of traffic on local roads during the construction phase as the majority of deliveries will be road freighted to site. Until such time as G7 receives a positive authorisation from the authorities (DEA and DME) and Eskom regarding the maximum electricity load that the existing infrastructure can handle in the area, it is difficult to provide an accurate estimate of the number of additional vehicles and abnormal loads that will be travelling to

(1) This study does not address the impact on the national roads but rather focuses on the farm roads around the site and local areas.

site. *Box 1.17* provides an overview of some of the anticipated delivery requirements during the construction phase.

Box 1.17 Anticipated Delivery Requirements during Construction

During foundation concrete pours (of which there will be 250), concrete deliveries will be required to run continuously. Each foundation will require approximately 80-90 loads of concrete (assuming each load is ~6m^3). Usually a foundation pour will start early in the morning and it will continue until completion.

For road construction, G7 would prefer to use onsite borrow pits then less stone will have to be hauled from commercial quarries. Final road capping will have to come from a commercial quarry.

The main transformer will be a single delivery to site. The unit transformer, switchgear and cable will also be road freighted to site during the installation phase when civil works have been completed to accept these components.

For the turbine component delivery, each complete turbine will require about seven separate deliveries (nacelle – 1; tower – 3; spinner, hub, PCU – 1; blades – 2). Turbine delivery will commence toward the end of the construction phase and when the foundations are ready.

The roads in the area will need to be upgraded to facilitate the movement of these large vehicles (potentially requiring widening, removing corners, levelling). A number of new roads will need to be constructed to enable access to the site and between the individual wind turbines on site. These will be constructed in accordance with the wind turbine supplier requirements.

G7 will maintain the local roads in good working order during the construction phase. G7 will engage with the local roads authority prior to the road upgrades and construction to ensure that their requirements are being met. The majority of the local roads that are going to be upgraded and maintained by G7 are private farm roads that are not used by commuters or tourists. The upgrades to these roads may result in increased numbers of road users.

The existing roads are gravel and sand roads that are often impassable as a result of heavy rains or excessive use. The large numbers of heavy construction vehicles and potentially the increased number of road users will create further damage to the existing farm roads. *Box 1.18* describes the impact on road infrastructure at the construction phase.

Box 1.18 Construction Impact: Road Infrastructure

Nature: The pre-mitigation impact of traffic on local roads users will have a **direct, negative** impact in terms of road quality.

Impact Magnitude – Medium

- **Extent:** An increase in traffic will affect local roads, and is therefore **local** (as per the scope of this study).
- **Duration:** This increase in construction traffic and road deterioration will be for the construction phase, and will thus be for the **short-term**.
- **Intensity:** The intensity will be **high** as those who are directly affected will not be able to continue current activities without intervention.

Likelihood – It is **definite** that this impact will occur during the construction phase.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MODEARATE

Degree of Confidence: The degree of confidence is **high**.

Operation Phase Impacts

During the operational phase, there are unlikely to be a large number of project vehicles accessing the site. The vehicles will be associated with regular site checks and maintenance and repair vehicles. These are unlikely to be large vehicles; however, when large-scale maintenance or upgrades are required, heavy vehicles will be required to access the site.

During the operation phase, the onsite access roads will be maintained by G7 operations personnel. It is not anticipated that significant amount of public road upgrades will be required during the operations phase. Where the proposed facility causes damage to the road during the operation phase G7 will promptly repair the damage. The maintenance of the roads were a key concern raised by land owners as they fear that should the roads not be sufficiently maintained it could lead to considerable erosion damage. The upgrades to, and maintenance of, these roads will benefit a small number of people given that the roads are primarily private farm roads. *Box 1.19* describes the impact on road infrastructure at the construction phase.

Box 1.19 Operational Impact: Road Infrastructure

Nature: The pre-mitigation impact of traffic on local roads users will have a **direct, negative** impact in terms of road quality.

Impact Magnitude – Low

- **Extent:** An increase in traffic will affect local roads, and is therefore **local** (as per the scope of this study).
- **Duration:** The traffic will continue for the full operational phase, and will therefore be for the **long-term**.
- **Intensity:** The intensity will be **negligible** as those who are directly affected will be able to adapt with relative ease given that the proposed project vehicles will be small and relatively infrequent as compared to the construction phase.

Likelihood – It is **definite** that this impact will occur during the operation phase.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MINOR

Degree of Confidence: The degree of confidence is **high**.

1.8.2 Mitigation

The objective of mitigation is to minimise impacts on roads in the local area and as far as possible improve the state of existing roads, thus creating a positive contribution in terms of improving road infrastructure.

Specific measures include:

- G7 will construct new roads in the local area and on the farms to enable access to the site and implement recommendations of the vegetation specialist (see *Section 7*).
- G7 will upgrade existing roads that will be used during the construction and operational phases of the proposed project.
- All road construction and upgrades will be undertaken with the consent of the directly affected landowners and where relevant, the Local Municipality.
- All roads that will be used by G7 during the operational phase of the project will be maintained by G7 throughout the life of the proposed project.

1.8.3 Residual Impact

The implementation of the above mitigation measures would convert the construction impacts from moderate negative to minor positive significance and the operation impacts from minor negative to minor positive. The reason that the post-mitigation impact is one of minor significance and not higher is that the positive impact will only be experienced by a limited number of people. The pre- and post-mitigation impacts are compared in *Table 1.16*.

Table 1.16 Pre- and Post- Mitigation Significance: Road Infrastructure

Phase	Significance (Pre-mitigation)	Residual Impact Significance
Construction	**MODERATE Negative**	**MINOR Positive**
Operation	**MINOR Negative**	**MINOR Positive**

1.9 DISCUSSION: UNMET STAKEHOLDER EXPECTATIONS

During stakeholder consultation it was evident that there are high expectations around economic benefits (employment and procurement), community development and local electricity provision associated with the proposed project.

Many of the stakeholder expectations will be met through routine project related activities (e.g. contract employment, procurement and skills development). Other expectations will be met through the community development contributions.

With regards to the provision of cheaper electricity to the project area, it is unlikely that G7 will be able to directly meet this demand. G7 is an independent power producer and is only allowed to sign a power purchase agreement with Eskom. The electricity produced at the facility will therefore be fed directly into the national electricity grid for distribution by Eskom. The presence of the wind farm and the sub-station would, however, make the possibility of electricity distribution in the area more accessible given the construction of the lower voltage transmission lines.

There is likely to be disappointment and potential anger and resentment if these expectations are not met. Unmet expectations that are not actively managed by G7 could have a negative impact on stakeholder relations.

1.10 DISCUSSION: PUBLIC HEALTH AND SAFETY

Public health and safety issues associated with wind farm are different from other forms of energy generation since a combustible fuel source, fuel storage, and generation of toxic or hazardous materials are not present. Wind energy projects do share similar electrical infrastructure requirements with conventional power generation facilities such as medium to high-voltage power lines and substation equipment. Unique concerns for wind turbines relate to the noise, shadow flicking, blade throw and fire hazards. These issues have been dealt with and therefore there is no need for a repeat discussion. Listed below are each of the issues/ concerns and the sections in the EIA where they are assessed:

- Noise/ infrasound: (noise study *Section 11*).
- Shadow flicker: (health and safety impacts *Section 15*.
- Blades throw: (health and safety impacts *Section 15*).
- Fire linked: (health and safety impacts *Section 15*.

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