

SOCIAL IMPACT ASSESSMENT

KLIPGAT SOLAR ENERGY FACILITY

NORTHERN CAPE PROVINCE

(DRAFT REPORT)

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Prepared for

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EXECUTIVE SUMMARY

INTRDUCTION AND LOCATION

Savannah Environmental (Pty) Ltd was appointed by Klipgat Solar Energy (Pty) Ltd as the lead consultants to manage the Environmental Impact Assessment (EIA) process for the establishment of a 75 MW photovoltaic solar energy facility (SEF) and associated infrastructure on a site located ~ 30 km east of the town of Hannover in the Northern Cape Province. The project is referred to as the Klipgat Solar Energy Facility (SEF). The project will be linked to the Eskom network and is therefore an Independent Power Producer (IPP) project.

Tony Barbour was appointed by Savannah Environmental to undertake a specialist Social Impact Assessment (SIA) as part of the EIA process. This report contains the findings of the SIA undertaken as part of the EIA process.

DESCRIPTION OF THE PROPOSED SOLAR ENERGY FACILITY

The Klipgat SEF is proposed to include arrays of photovoltaic (PV) solar panels with a generating capacity of approximately 75 MW. The SEF will include the following associated infrastructure:

- Solar panels with a generating capacity of 75 MW;
- An on-site inverter to step up the power and a substation to facilitate the connection between the solar energy facility and the Eskom electricity grid;
- A loop-in and loop out power line to connect into the existing Linde-Carolus 132kV power line which traverse the site;
- Internal access roads;
- Workshop area for maintenance and storage.

Based on the information from other SEF projects the construction phase for a 75MW SEF is expected to extend over a period of 18-24 months and create approximately 291 employment opportunities. The capital expenditure on completion is anticipated to be in the region of R 1.35 billion for a 75 MW facility. The total wage bill will be in the region of R60 million. The operational phase will employ approximately 60 people full time for a period of up to 20 years.

SUMMARY OF KEY FINDINGS

The assessment section is divided into:

- Assessment of compatibility with relevant policy and planning context (“planning fit”);
- Assessment of social issues associated with the construction phase;
- Assessment of social issues associated with the operational phase;
- Assessment of social issues associated with the decommissioning phase;
- Assessment of power line alignments;
- Assessment of the “no development” alternative;
- Assessment of cumulative impacts.

POLICY AND PLANNING ISSUES

The key documents reviewed included:

- The National Energy Act (2008)
- The White Paper on the Energy Policy of the Republic of South Africa (December 1998)
- The White Paper on Renewable Energy (November 2003)
- Integrated Resource Plan (IRP) for South Africa (2010-2030);
- Northern Cape Provincial Growth and Development Strategy (2004-2014)
- Northern Cape Climate Change Response Strategy (in progress);
- Pixley ka Seme District Municipality Integrated Development Plan 2012-2016;
- Emthanjeni Local Municipality Integrated Development Plan 2012-2013;
- Emthanjeni Tourism Strategy 2010-2020.

The findings of the review indicated that solar energy is strongly supported at a national, provincial, and local level. In this regard the ELM IDP identifies De Aar as a **Renewable Energy Hub**. Based on this the establishment of the proposed Klipgat SEF is supported by the relevant policy and planning documentation.

CONSTRUCTION PHASE

The key social issues associated with the construction phase include:

- Creation of employment and business opportunities, and the opportunity for skills development and on-site training.

The construction phase for a 75MW SEF is expected to extend over a period of 18-24 months and create approximately 291 employment opportunities, depending on the final design. Of this total ~ 68% (198) will be available to low-skilled workers (construction labourers, security staff etc.) and semi-skilled workers (drivers, equipment operators etc.) and 32% (93) to skilled personnel (engineers, land surveyors, project managers etc.). The majority of low and semi-skilled employment opportunities are likely to be available to local residents in the area, specifically residents from Hanover, Noupoort and Middelburg. The majority of the beneficiaries are likely to be historically disadvantaged (HD) members of the community. This would represent a significant positive social benefit in an area with limited employment opportunities. However, due to the potential mismatch of skills and low education levels, the potential employment opportunities for the members from these local communities may be low. This is an issue that will need to be addressed during the recruitment process. The proponent will therefore need to demonstrate a commitment to local employment targets in order to maximise the opportunities and benefits for members from the local community.

The total wage bill for the construction phase is estimated to be in the region of R 60 million. This is based on the assumption that the average monthly salary for low, semi and skilled workers is R 5 000, R 12 000 and R 30 000 respectively. The injection of income into the area in the form of wages will represent a significant opportunity for the local economy and businesses in Hanover.

The capital expenditure on completion is anticipated to be in the region of R1.35 billion for a 75MW facility. In terms of business opportunities for local companies, expenditure during the construction phase will create business opportunities for the regional and local economy. However, given the technical nature of the project and high import

content associated with SEF's the opportunities for the local economy and towns such as Middelburg and Hanover are likely to be limited. However, opportunities are likely to exist for local contractors and engineering companies in Middelburg and De Aar. The implementation of the enhancement measures listed below can enhance these opportunities.

The sector of the local economy that is most likely to benefit from the proposed development is the local service industry. The potential opportunities for the local service sector would be linked to accommodation, catering, cleaning, transport and security, etc. associated with the construction workers on the site. The majority of construction workers are likely to be accommodated in Middelburg and Hanover. This will create opportunities for local hotels, B&Bs, guest farms and people who want to rent out their houses. However, based on the information collected during the site visit the accommodation opportunities in the area are limited. This is an issue that the proponent will need to discuss with the ELM. The hospitality industry in the local towns is also likely to benefit from the provision of accommodation and meals for professionals (engineers, quantity surveyors, project managers, product representatives etc.) and other (non-construction) personnel involved on the project. Experience from other large construction projects indicates that the potential opportunities are not limited to on-site construction workers but also to consultants and product representatives associated with the project.

The establishment of the proposed SEF also supports the objectives set out in the NCPGDS and the PKSDM and ELM IDPs, specifically the creation of employment and economic development opportunities. The proposed SEF will also create opportunities to support SMMEs and co-operation between the public and private sector in the Northern Cape Province.

Potential negative impacts

- Impacts associated with the presence of construction workers on site
- Influx of job seekers to the area;
- Loss of farm labour to the construction phase;
- Increased risk of stock theft, poaching and damage to farm infrastructure associated with presence of construction workers on the site
- Increased risk of veld fires associated with construction-related activities
- Threat to safety and security of farmers associated with the presence of construction workers on site
- Impact of heavy vehicles, including damage to roads, safety, noise and dust
- Potential loss of grazing land associated with construction-related activities.

The significance of the majority of potential negative impacts with mitigation was assessed to be of Low significance. All of the potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. In addition, given that the majority of the low and semi-skilled construction workers can be sourced from the local area the potential risk at a community level to local family structures and social networks is regarded as Low negative significance. However, the impact on individuals who are directly impacted on by construction workers and or job seekers (i.e. contract HIV/ AIDS) was assessed to be of High negative significance.

Table1 summarises the significance of the impacts associated with the construction phase.

Table 1: Summary of social impacts during construction phase

Impact	Significance No Mitigation	Significance With Enhancement /Mitigation
Creation of employment and business opportunities	Medium (Positive impact)	Medium (Positive impact)
Presence of construction workers and potential impacts on family structures and social networks	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)
Influx of job seekers	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)
Loss of farm labour	Low (Negative impact)	Low (Negative impact)
Risk of stock theft, poaching and damage to farm infrastructure	Medium (Negative impact)	Low (Negative impact)
Risk of veld fires	Medium (Negative impact)	Low (Negative impact)
Impact of heavy vehicles and construction activities	Low (Negative impact)	Low (Negative impact)
Loss of farmland	Medium (Negative impact)	Low (Negative impact)

OPERATIONAL PHASE

The key social issues affecting the operational phase include:

Potential positive impacts

- Creation of employment and business opportunities. The operational phase will also create opportunities for skills development and training;
- Benefits associated with the establishment of a Community Trust;
- The establishment of infrastructure to generate renewable energy.

The 75 MW Klipgat SEF will create ~ 60 employment opportunities during the construction phase. The majority of the employment opportunities are likely to benefit HD members of the community. The proponent has also indicated that they are committed to implementing a training and skills development programme during the operational phase. Such a programme would support the strategic goals of promoting local employment and skills development contained in the ELM IDP.

The establishment of a Community Trust funded by revenue generated from the sale of energy from the proposed Klipgat SEF also creates an opportunity to support local economic development in the area. In this regard Community Trusts provide an opportunity to generate a steady revenue stream that is guaranteed for a 20 year

period. The revenue from the proposed Klipgat SEF plant can be used to support a number of social and economic initiatives in the area, including:

- Education;
- Health care;
- Training and skills development;
- Support for SMME's.

The long term duration of the revenue stream also allows local municipalities and communities to undertake long term planning for the area. Experience has however also shown that Community Trusts can be mismanaged. This issue will need to be addressed in order to maximise the potential benefits associated with the establishment of a community trust.

Due the number of other renewable energy facilities proposed in the ELM it is recommended that the ELM investigate the option of establishing a forum to assist the renewable energy sector with the establishment of Community Trusts. This would enable the ELM to ensure that the various Community Trusts established as per the requirements set out by the Department of Energy are aligned with and support the developmental objectives set out in the ELM's Integrated Development Plan (IDP) and Local Economic Development (LED) strategy.

The proposed development also represents an investment in infrastructure for the generation of clean, renewable energy, which, given the challenges created by climate change, represents a Positive social benefit for society as a whole.

Potential negative impacts

- Influx of job seekers to the area;
- Loss of farm workers to jobs associated with the operational phase;
- The visual impacts and associated impact on sense of place;
- Potential impact on tourism.

The significance of the potential negative impacts with mitigation was assessed to be of Low negative significance. The majority of the potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. However, the impact on individuals who are directly impacted on by job seekers (i.e. contract HIV/ AIDS) was assessed to be of High negative significance.

The visual impacts on landscape character associated with WEFs are highlighted in the research undertaken by Warren and Birnie (2009). In the South African context, the majority of South Africans have a strong connection with and affinity for the large, undisturbed open spaces that are characteristic of the South African landscape. Similar concerns are also likely to apply to SEFs, specifically given South African's strong attachment to the land and the growing number of renewable energy applications. However, the findings of the SIA indicate that the significance with mitigation of the potential visual impacts associated with the proposed Klipgat SEF is likely to be low. In addition, the ELM has identified renewable energy as a key growth sector.

The significance of the impacts associated with the operational phase are summarised in Table 2.

Table 2: Summary of social impacts during operational phase

Impact	Significance No Mitigation	With Enhancement /Mitigation
Creation of employment and business opportunities	Medium (Positive impact)	Medium (Positive impact)
Establishment of Community Trust	Medium (Positive impact)	High (Positive impact)
Establishment of infrastructure for the generation of renewable energy	Medium (Positive impact)	Medium (Positive impact)
Influx of job seekers	Medium (Negative impact for community as a whole) Medium-High (Negative impact of individuals)	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)
Loss of farm labour	Low (Negative impact)	Low (Negative impact)
Visual impact and impact on sense of place	Medium (Negative impact)	Low (Negative impact)
Impact on tourism	Low (Positive and Negative)	Low (Positive and Negative)

Power line impacts

The findings of the SIA indicate that the social impacts associated with the power line are likely to be low.

Cumulative impacts

The cumulative impacts associated with solar energy facilities, such as the proposed Klipgat SEF, are largely linked to the visual impact on the areas sense of place and landscape character.

In the case of the proposed Klipgat SEF, there are ~ 10 SEFs proposed in the PKSDM, the majority of which are located around De Aar, Prieska and Hanover west of the N1. Klipgat is the only SEF one in ELM east of the N1. Two SEFs and one WEF are proposed south of Noupport (i.e. 20-30 km away). However, the volume of traffic on the Dwaal Road is extremely low. The potential cumulative impacts associated with sequential visibility (e.g. the effect of seeing two or more wind farms (solar facilities) along a single journey, e.g. road or walking trail) is therefore likely to be low.

Despite this it is recommended that the environmental authorities consider the overall cumulative impact on the rural character and the areas sense of place before a final decision is taken with regard to the optimal number of renewable energy facilities in the area. In addition, the final location of individual components of the SEF should be informed by findings of the relevant VIAs, specifically with respect to the visual impact on farmsteads and important roads in the area.

The proposed Klipgat SEF and establishment of the other renewable energy projects in the area also have the potential to result in significant positive cumulative socio-economic impacts for the ELM. The positive cumulative impacts include creation of employment, skills development and training opportunities (construction and operational phase), creation of downstream business opportunities and stimulation of the local

property market. The significance of this impact is rated as High positive with enhancement.

No-development option

The No-Development option would represent a lost opportunity for South Africa to supplement its current energy needs with clean, renewable energy. Given South Africa's position as one of the highest per capita producer of carbon emissions in the world, this would represent a negative social cost. The no-development option also represents a lost opportunity in terms of the employment and business opportunities (construction and operational phase) associated with the proposed SEF and the benefits associated with the establishment of a Community Trust. This also represents a negative social cost. The no-development option without mitigation is rated as medium negative significance. With mitigation, which assumes, that the proposed SEF is developed, the significance is rated as medium positive.

Decommissioning

Given the relatively small number of people employed during the operational phase (~60), the social impact on the local community associated with decommissioning is likely to be low. In addition, the potential impacts can be effectively managed with the implementation of a retrenchment and downscaling programme. With mitigation, the impacts are assessed to be Low (negative).

The proponent should also investigate the option of establishing an Environmental Rehabilitation Trust Fund to cover the costs of decommissioning and rehabilitation of disturbed areas. The Trust Fund should be funded by a percentage of the revenue generated from the sale of energy to the national grid over the 20 year operational life of the facility. The rationale for the establishment of a Rehabilitation Trust Fund is linked to the experiences with the mining sector in South Africa and failure of many mining companies to allocate sufficient funds during the operational phase to cover the costs of rehabilitation and closure.

CONCLUSIONS AND RECOMMENDATIONS

The findings of the SIA indicate that the development of the proposed Klipgat SEF will create employment and business opportunities for locals during both the construction and operational phase of the project. The enhancement measures listed in the report should be implemented in order to enhance these benefits. In addition, the proposed establishment of a number of other renewable energy facilities in the area will create significant socio-economic opportunities for the area and the ELM, which, in turn, will result in a positive social benefit. These benefits will assist to offset the negative impacts associated with the decline in the mining sector over the last 20 or so years.

The establishment of a Community Trust funded by revenue generated from the sale of energy from the proposed SEF also creates an opportunity to support local economic development in the area. Given the size of the proposed facility (75MW) this will represent a significant social benefit for an area where there are limited opportunities.

The proposed development also represents an investment in clean, renewable energy infrastructure, which, given the challenges created by climate change, represents a positive social benefit for society as a whole. The establishment of the proposed Klipgat SEF is therefore supported by the findings of the SIA.

However, the potential impacts associated with wind and solar energy facilities on the areas sense of place and landscape cannot be ignored. These impacts are an issue that

will need to be addressed by the relevant environmental authorities, specifically given the large number of applications for renewable energy facilities in the area.

IMPACT STATEMENT

The findings of the SIA undertaken for the proposed Klipgat SEF indicate that the development will create employment and business opportunities for locals during both the construction and operational phase of the project. The establishment of a Community Trust will also create an opportunity to support local economic development in the area. The development of renewable energy has also been identified as key growth sector by the ELM and also represents an investment in clean, renewable energy infrastructure, which, given the challenges created by climate change, represents a positive social benefit for society as a whole.

It is therefore recommended that the SEF as proposed be supported, subject to the implementation of the recommended enhancement and mitigation measures contained in the report.

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ACRONYMS

DEA&DP	Department of Environmental Affairs and Development Planning (Western Cape)
DM	District Municipality
DMA	District Management Area
DoE	Department of Energy
EIA	Environmental Impact Assessment
ELM	Emthanjeni Local Municipality
GDP	Gross Domestic Product
GDPR	Gross Domestic Product of the Region
HDI	Human Development Index
IDP	Integrated Development Plan
I&Aps	Interested and Affected Parties
IPP	Independent Power Producer
IRP	Integrated Resource Plan
kV	Kilovolts
LED	Local Economic Development
LM	Local Municipality
MW	Megawatt
NCPGDS	Northern Cape Provincial Growth and Development Strategy
PGDS	Provincial Growth and Development Strategy
PkSDM	Pixley ka Seme District Municipality
PV	Photovoltaic
PVSEF	Photovoltaic Power Plant
SDF	Spatial Development Framework
SIA	Social Impact Assessment
UNFCCC	United Nations Framework Convention on Climate Change

SECTION 1: INTRODUCTION

1.1 INTRODUCTION

Savannah Environmental (Pty) Ltd was appointed by Klipgat Solar Energy (Pty) Ltd as the lead consultants to manage the Environmental Impact Assessment (EIA) process for the establishment of a 75 MW photovoltaic solar energy facility (PVSEF) and associated infrastructure on a site located ~ 30 km (linear) east of the town of Hanover in the Northern Cape Province (Figure 1.1). The project is referred to as the Klipgat Solar Energy Facility (SEF).

Tony Barbour was appointed by Savannah Environmental to undertake a specialist Social Impact Assessment (SIA) as part of the EIA process. This report contains the findings of the SIA undertaken as part of the EIA process.

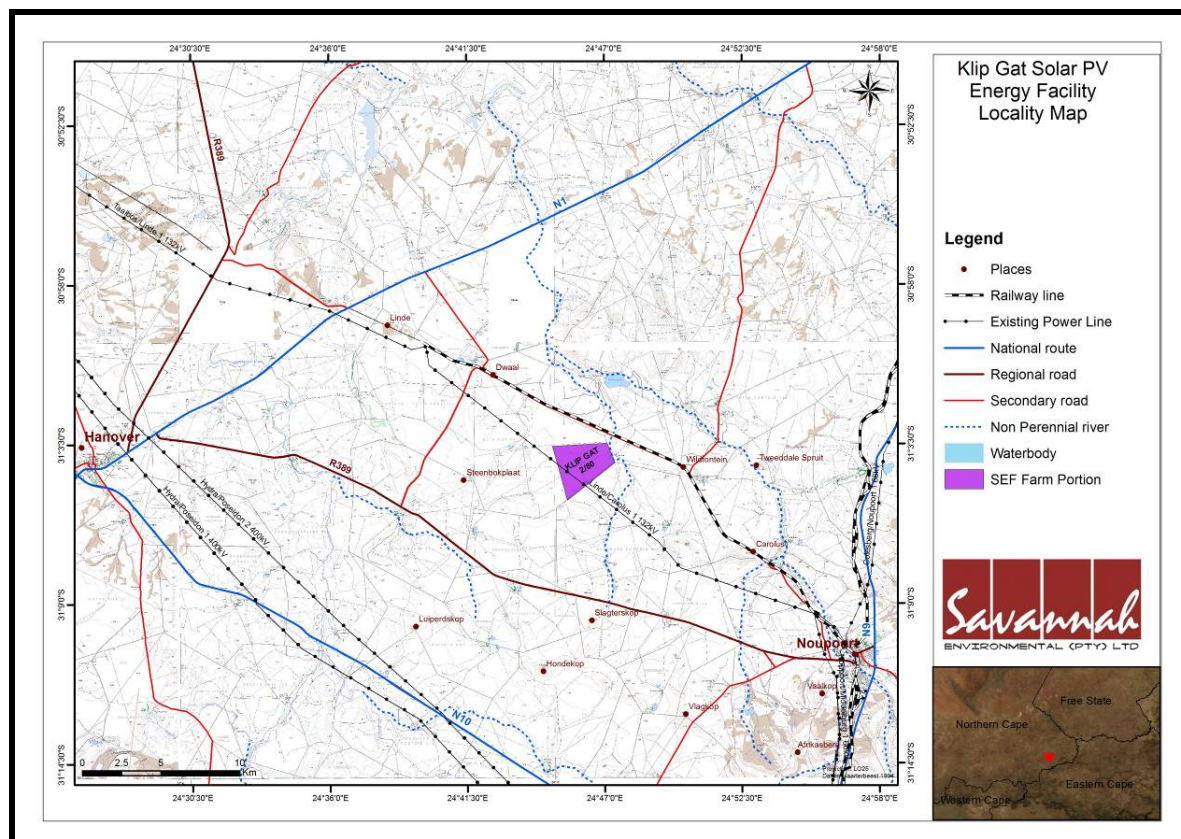


Figure 1.1: Location of the proposed Klipgat Solar Energy Facility

1.2 TERMS OF REFERENCE

The terms of reference for the SIA require:

- A description of the environment that may be affected by the activity and the manner in which the environment may be affected by the proposed facility.
- A description and assessment of the potential social issues associated with the proposed facility.
- Identification of enhancement and mitigation aimed at maximising opportunities and avoiding and or reducing negative impacts.

1.3 SITE LOCATION

The proposed Klipgat SEF site is located on Portion 2 of the Farm Klipgat 80 in the Hanover rural area east of the N1. The site and town of Hanover are located within the Emthanjeni Local Municipality (ELM). The town of Nouport in the adjacent Umsobomvu LM is located ~20 km south-east of the Klipgat site. Both LMs form part of the Pixley ka Seme District Municipality seated in De Aar. De Aar is located ~90 km north-west of the site.

Klipgat 2/80 is 848 ha in extent, and forms part of Holvlakte Farm, based on the adjacent Holvlakte 82 (Photograph 1.1). Holvlakte operations and also includes adjacent Allemamsfontein and Damfontein Farms. The owner and one farm labourer family reside on Holvlakte.



Photograph 1.1: Holvlakte farmyard viewed from road to development area on Klipgat

Holvlakte and adjacent farming operations (Vlakplaas, Visgat, Damfontein, Skuilhoek, Plaatjiesfontein, etc) are based on livestock (sheep and beef cattle) farming and to a lesser extent game (mainly for hunting). Most operations also grow irrigated fodder crops (alfalfa) for own use. Operations are spatially extensive (~5000 ha or more), and distances between inhabited farm houses large (5-10 km). Holvlakte is accessed off the Dwaal-Hannover gravel road along the Dwaal railway sideline, almost exactly midway (~20 km) between the N1 to the west and Noupoort to the south east.

The proposed SEF development area consists of natural veld which has historically been used for grazing. Klipfontein is traversed by an existing 132 kV Eskom line.

1.4 PROJECT DESCRIPTION

Solar energy facilities, such as those using PV panels, use the energy from the sun to generate electricity (the Photovoltaic Effect). This effect refers to photons of light colliding with electrons, and therefore placing the electrons into a higher state of energy to create electricity. A photovoltaic array typically consists of the following components:

Photovoltaic Cells

Silicon wafers which are the building blocks, act as semiconductors and when struck by light produce electricity. Individual photovoltaic cells are linked in circuit and placed behind a protective transparent cover sheet to collectively form a photovoltaic panel/array. Photovoltaic cells are highly sensitive to shading, and the output of an entire circuit can be significantly decreased when even a small portion of a cell, panel, or array is shaded, while the remainder is in sunlight. Dust or dirt can also affect the efficiency, therefore, requiring maintenance, the regularity of which depends on the characteristics of the site (i.e. predominant wind direction and dusty conditions).

Support structure

The photovoltaic panels are fixed to support structures which are either bolted or piled directly into the ground or fixed by means of concrete foundations. The support structure will be approximately 2 meters off the ground and set at an angle so to receive the maximum amount of solar radiation (Figure 1.2). The angle of the panel is dependent on the latitude of the proposed facility and the angles may be adjusted to optimise for summer or winter solar radiation characteristics.

Inverter

The photovoltaic effect produces electricity in direct current. However, in order to transmit this power within the Eskom grid it must be converted to alternating current which requires an inverter. When the photovoltaic panels are connected as separate strings, each string can be allocated its own inverter thereby ensuring the continued operation of the facility should one or more strings be compromised or require maintenance.



Figure 1.2: Stationary solar PV panels.

The basic infrastructure associated with the proposed Klipgat SEF would include:

- An array of photovoltaic (PV) panels with a generation capacity of 75MW;
- A new on-site substation to evacuate the power from the facility into the Eskom;
- A short (<200 m) overhead 132 kV line from the proposed on-site substation to the existing 132kV Linde-Carolus power line traversing Klipgat (Figure 1.3);
- Mounting structure to be either rammed steel piles or piles with pre-manufactured concrete footings to support the PV panels;
- Cabling between the project components, to be laid underground where practical.
- Internal access roads and fencing;
- Workshop area for maintenance, storage, and offices; and
- Maintenance building and site office.

Based on information from other SEFs the construction phase for the proposed 75 MW Klipgat SEF is expected to extend over a period of 18-24 months and create approximately 291 construction related jobs. The capital expenditure associated with the construction of a 75 MW SEF will be in the region of R 1.35 billion (current 2012 rand values). During the operational phase the project will create ~ 60 employment opportunities.

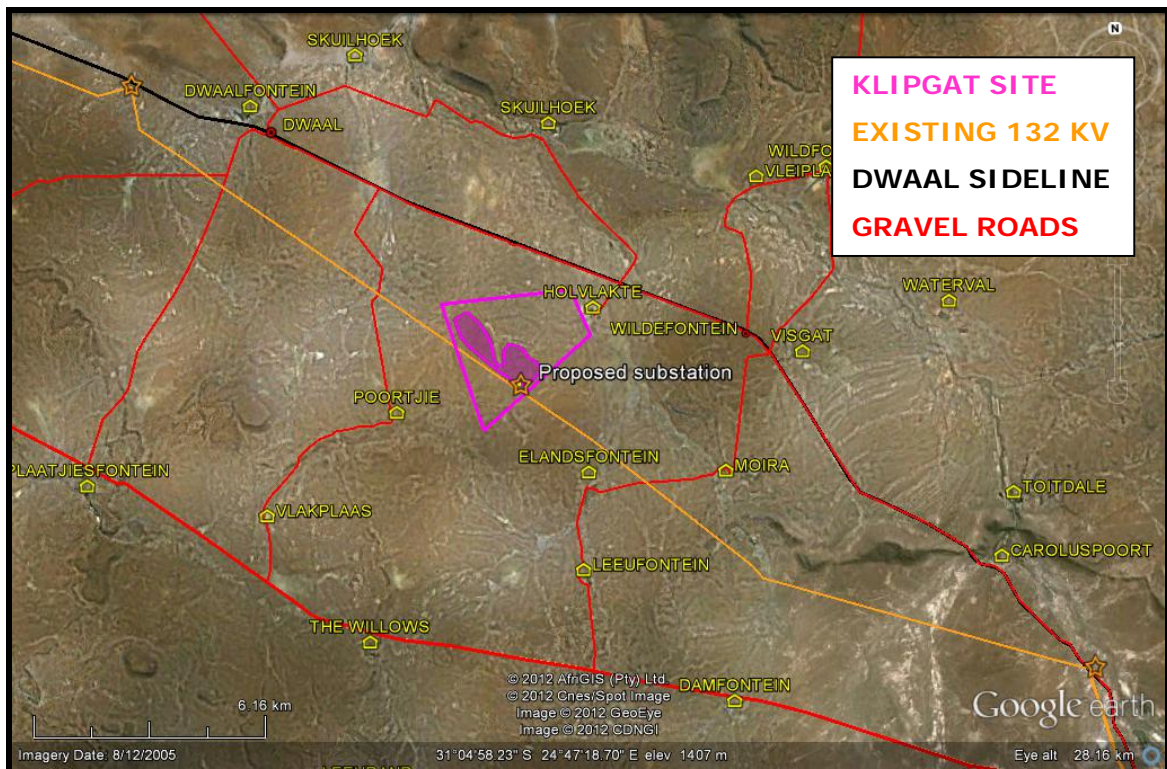


Figure 1.3: Proposed Klipgat SEF site and on-site substation

Other SEFs in the study area

The Pixley ka Seme DM has identified itself as a Renewable Energy Hub. In as far as could be established, approximately 10 SEF applications are currently pending or have been approved in the PKSDM. The majority of applications are currently concentrated around De Aar and Prieska, but also include two applications around Noupoot. Klipgat is currently the only SEF application in the Emthanjeni LM east of the N1 (Madyo, Stonga – pers. comm).

1.5 APPROACH TO STUDY

The approach to the SIA study is based on the Western Cape Department of Environmental Affairs and Development Planning Guidelines for Social Impact Assessment (February 2007). These guidelines are based on international best practice. The key activities in the SIA process embodied in the guidelines include:

- Describing and obtaining an understanding of the proposed intervention (type, scale, and location), the settlements, and communities likely to be affected by the proposed project.
- Collecting baseline data on the current social and economic environment.
- Identifying the key potential social issues associated with the proposed project. This requires a site visit to the area and consultation with affected individuals and communities. As part of the process a basic information document was prepared and made available to key interested and affected parties. The aim of the document was to inform the affected parties of the nature and activities associated with the

construction and operation of the proposed development to enable them to better understand and comment on the potential social issues and impacts.

- Assessing and documenting the significance of social impacts associated with the proposed intervention.
- Identifying alternatives and mitigation measures.

In this regard the study involved:

- Review of demographic data from the 2001 Census Survey;
- Review of relevant planning and policy frameworks for the area;
- Site specific information collected during the site visit to the area and interviews with interested and affected parties;
- Review of information from similar studies, including the EIAs undertaken for other renewable energy projects in the De Aar area;
- Identification and assessment of the social issues associated with the proposed project.

The identification of potential social issues associated with proposed facility is based on observations during the project site visit, review of relevant documentation, experience with similar projects and the area. Annex A contains a list of the secondary information reviewed and interviews conducted. Annexure B outlines the methodology used to assign significance ratings.

1.5.1 Definition of social impacts

Social impacts can be defined as “The consequences to human populations of any public or private actions (these include policies, programmes, plans and/or projects) that alter the ways in which people live, work, play, relate to one another, organise to meet their needs and generally live and cope as members of society. These impacts are felt at various levels, including individual level, family or household level, community, organisation or society level. Some social impacts are felt by the body as a physical reality, while other social impacts are perceptual or emotional” (Vanclay, 2002).

When considering social impacts it is important to recognise that social change is a natural and on-going process (Burdge, 1995). However, it is also important to recognise and understand that policies, plans, programmes, and/or projects implemented by government departments and/or private institutions have the potential to influence and alter both the *rate* and *direction* of social change. Many social impacts are not in themselves “impacts” but change process that may lead to social impacts (Vanclay, 2002). For example the influx of temporary construction workers is in itself not a social impact. However, their presence can result in range of social impacts, such as increase in antisocial behaviour. The approach adopted by Vanclay stresses the importance of understanding the processes that can result in social impacts. It is therefore critical for social assessment specialists to think through the complex causal mechanisms that produce social impacts. By following impact pathways, or causal chains, and specifically, by thinking about interactions that are likely to be caused, the full range of impacts can be identified (Vanclay, 2002).

An SIA should therefore enable the authorities, project proponents, individuals, communities, and organisations to understand and be in a position to identify and anticipate the potential social consequences of the implementation of a proposed policy, programme, plan, or project. The SIA process should alert communities and individuals to the proposed project and possible social impacts, while at the same time allowing them to assess the implications and identify potential alternatives. The assessment

process should also alert proponents and planners to the likelihood and nature of social impacts and enable them to anticipate and predict these impacts in advance so that the findings and recommendations of the assessment are incorporated into and inform the planning and decision-making process.

However, the issue of social impacts is complicated by the way in which different people from different cultural, ethnic, religious, gender, and educational backgrounds etc. view the world. This is referred to as the “social construct of reality.” The social construct of reality informs people’s worldview and the way in which they react to changes.

1.5.2 Timing of social impacts

Social impacts vary in both time and space. In terms of timing, all projects and policies go through a series of phases, usually starting with initial planning, followed by implementation (construction), operation, and finally closure (decommissioning). The activities, and hence the type and duration of the social impacts associated with each of these phases are likely to differ.

1.6 ASSUMPTIONS AND LIMITATIONS

1.6.1 Assumptions

Identification of area for the PVSEF

The identification of the proposed site was informed by technical information relating to local climatic conditions in the area, specifically annual rates of solar radiation, local topography and land availability.

Strategic importance of the project

The strategic importance of promoting solar energy is supported by the national and provincial energy policies.

Fit with planning and policy requirements

Legislation and policies reflect societal norms and values. The legislative and policy context therefore plays an important role in identifying and assessing the potential social impacts associated with a proposed development. In this regard a key component of the SIA process is to assess the proposed development in terms of its fit with key planning and policy documents. As such, if the findings of the study indicate that the proposed development in its current format does not conform to the spatial principles and guidelines contained in the relevant legislation and planning documents, and there are no significant or unique opportunities created by the development, the development cannot be supported.

However, the study recognises the strategic importance of solar energy and the technical, spatial and land use constraints required for such facilities.

Generic issues relating to renewable energy

A number of the key authorities in the PKSDM and the Northern Cape Province have been interviewed as part of the SIAs for other solar energy projects. For the purpose of the SIA it is assumed that the generic comments relating to renewable energy, and specifically solar energy, also apply to the proposed Klipgat SEF development.

1.6.2 Limitations

Demographic data

Some of the demographic data used in the study is based on the findings of the 2001 Census. The data from the 2011 Census was not available at the time that the socio-economic baseline sections of the SIA were prepared. While the 2001 data does provide useful information on the demographic profile of the affected area, the actual data is dated and should be treated with care.

1.7 SPECIALIST DETAILS

The author of this report is an independent specialist with 23 years' experience in the field of environmental management. In terms of SIA experience Tony Barbour has undertaken in the region of 120 SIA's and is the author of the Guidelines for SIAs for EIA's adopted by DEA&DP in the Western Cape in 2007.

Schalk van der Merwe, the co-author of this report, has an MPhil in Environmental Management from the University of Cape Town and has worked closely with Tony Barbour on a number of SIAs over the last nine years, including on a number of SEF projects.

1.8 DECLARATION OF INDEPENDENCE

This confirms that Tony Barbour and Schalk van der Merwe, the specialist consultants responsible for preparing the Draft SIA Report for the Environmental Impact Assessment are independent and do not have vested or financial interests in the proposed project being either approved or rejected.

1.9 REPORT STRUCTURE

The report is divided into five sections, namely:

- Section 1: Introduction
- Section 2: Summary of key policy and planning documents relating to solar energy and the area in question
- Section 3: Overview of the study area
- Section 4: Identification and assessment of key social issues
- Section 5: Summary of key findings and recommendations.

SECTION 2: OVERVIEW OF THE STUDY AREA

2.1 INTRODUCTION

Section 2 provides an overview of the study area with regard to:

- The relevant administrative context;
- The provincial socio-economic context; and,
- The municipal-level socio-economic context;
- Surrounding land uses.

2.2 STUDY AREA CONTEXT

2.2.1 Administrative context

The proposed SEF is located in the Northern Cape Province (NCP), which is the largest province in South Africa, covering an area of 361 830 km² (~ 30% of South Africa). The province is divided into five district municipalities (DM), namely, Frances Baard, Pixley ka Seme, Namakwa, Siyanda, and John Taolo Gaetsewe DM, and twenty-six Category B (Local) municipalities. The proposed Klipgat SEF site is located in the Emthanjeni Local Municipality (ELM), which is one of eight local municipalities making up the Pixley ka Seme District Municipality (PKSDM) (NCDC7) in the south-east of the Northern Cape Province (Figure 2.1). The other seven local municipalities are the Umsobomvu, Siyathemba, Kareeberg, Thembelihle, Siyancuma, Renosterberg and Ubuntu.

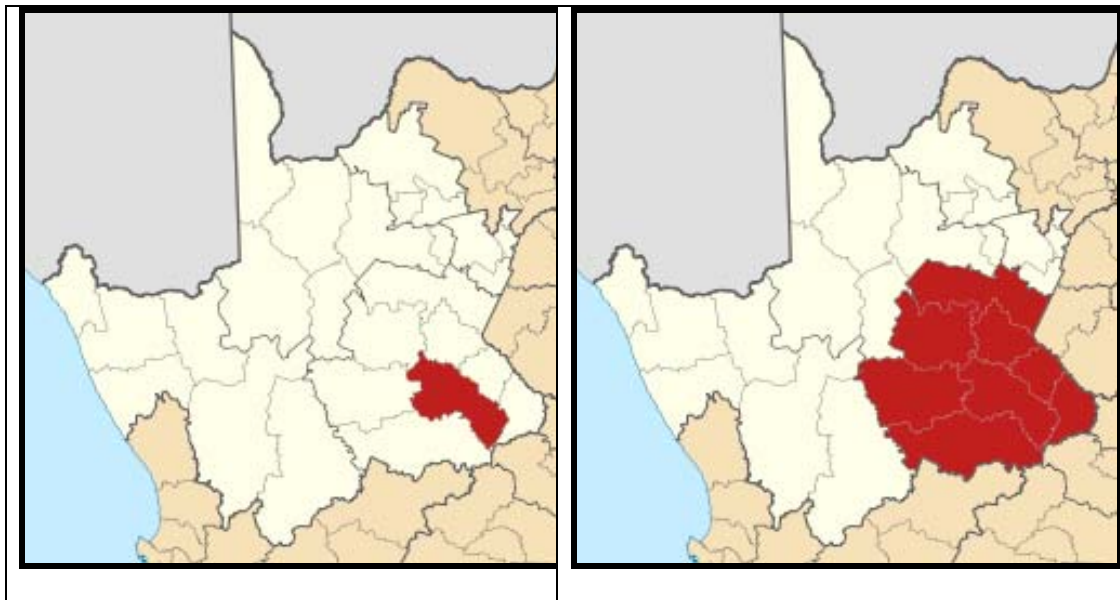


Figure 2.1: The location of Emthanjeni Local Municipality (Left) and Pixley ka Seme District Municipality (Right) within the Northern Cape Province (white)
(Source: Wikipedia)

The town of De Aar, which functions as the administrative seat of both the ELM and PKSDM, is the third largest town in the Northern Cape Province (~45 000), and is located ~ 100 km north-west of the site by road. De Aar is a major railway junction that links Gauteng, Cape Town, Port Elizabeth, the Port at Coega, and Namibia.

The PKSDM is the second largest of the five DMs comprising the NCP, covers a surface area of 102 766 km², and has an estimated population of 164 603 (PKSDM IDP 2010/2011). A total of 24 medium to very small sized towns are located in the DM. Key towns in Emthanjeni are De Aar, Hanover and Britstown. Noupoort and Colesberg, both located in the Umsobomvu LM, are also located in relative proximity to the Klipgat site. The large town of Middelburg located to the south of Noupoort, is located in the Eastern Cape Province (ECP).

The Emthanjeni LM is comprised of 7 Wards. The Klipgat site is located in the easternmost ward, Ward 6, which consists of the farms to the east and north of Hanover. As such, Ward 6 is essentially a rural Ward, with a low and spatially dispersed population.

2.2.2 Road network

The Klipgat site is located within relative proximity to three national routes, namely the N1 (Cape Town to Musina via Gauteng), the N10 (N2/ Port Elizabeth to Namibia, via De Aar and Upington), and the N9 (N2/ George to Colesberg) (Figure 2.2).

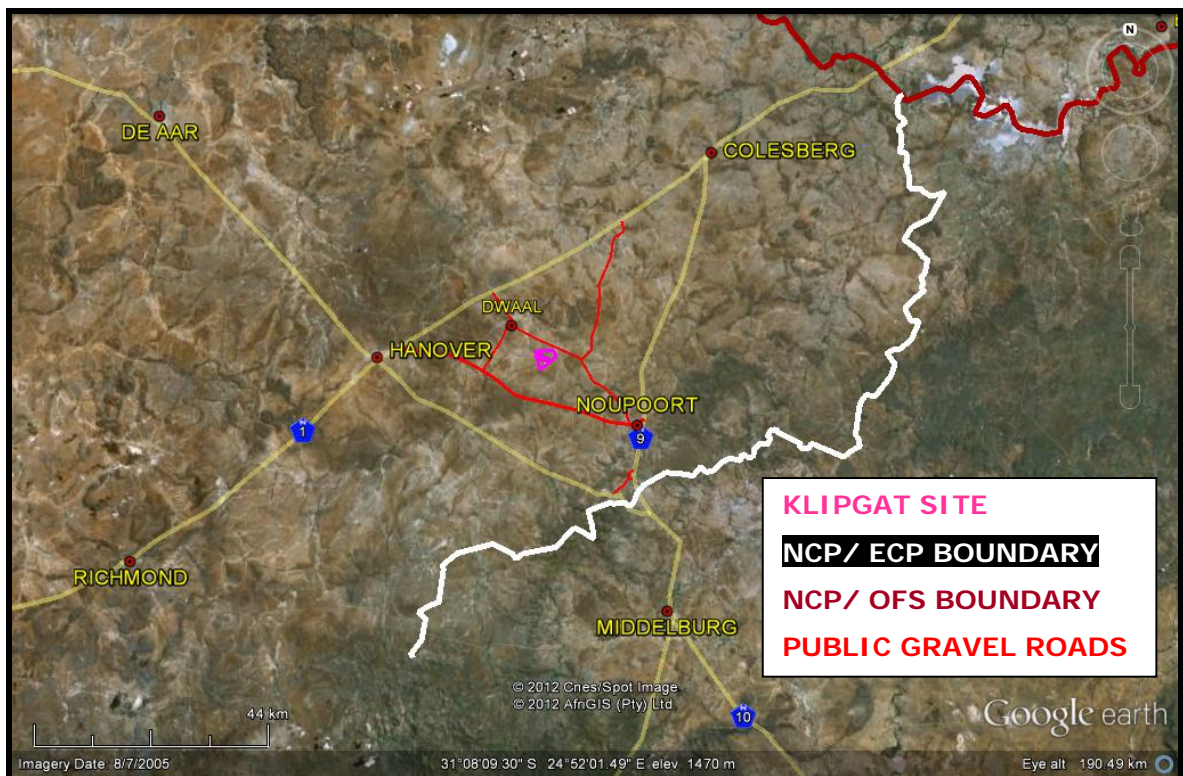


Figure 2.2: Klipgat site in relation to major towns and road links in the region

Access to the Klipgat site is via the Holvlakte main access road off the Dwaal-Noupoort road. Holvlakte is located approximately equidistant (~20 km) from the Dwaal turnoff on

the N1 22 km north of Hanover, and Noupoort to the south-east. The road is essentially aligned along the Dwaal railway line sideline (goods) (Photograph 2.1). The R389 aligned ~10 km to the south of Klipgat provides a direct link between Noupoort and Hanover. The R389 is linked to the Dwaal Road.



Photograph 2.1: Dwaal-Noupoort road and Dwaal sideline east of Dwaal

Due to the site's central location it is located within relatively easy driving distance from key potential labor sending areas and towns that can accommodate project labor and provide other services (Table 2.1). With the exception of Middelburg, all of these towns are located in the PLSDM, although Noupoort and Colesberg are not located in the Emthanjeni LM.

Table 2.1: Klipgat site in relation to key towns in the region (by road)

	Direct route	Approximate distance
Hanover	N1 - R389/ Dwaal gravel road	~35-45 km
De Aar	N10 – N1 – R389/ Dwaal gravel road	~100-110 km
Noupoort	Dwaal gravel road	~20 km
Middelburg	N9 - Dwaal gravel road	~62 km
Colesberg	N1- Dwaal gravel road	~60-70 km

Source: Google Earth and www.saexplorer.co.za

2.3 STUDY AREA SETTLEMENT PATTERNS AND LAND USES

2.3.1 Pixley ka Seme District Municipality

Pixley ka Seme is located in the vast, arid (<250 mm/a), sparsely populated Karoo region of inland South Africa. The PKSDM is traversed (east to west) by the Gariep (Orange) river, the country's largest river. The majority of towns and settlements in the area are located along the Gariep. The river also supports significant irrigation agriculture (~75% of the ELM's agricultural GDP). Two of the three largest dams in Southern Africa are located on the Gariep inside the PKSDM area.

Outside the narrow confines of the Gariep Valley, including within the Emthanjeni LM (not traversed by the Gariep), the settlement pattern is sparse, population densities very low, and commercial extensive stock farming the dominant land use. The ELM area is characterized by relatively flat terrain ("vlaktes"), koppies and ephemeral watercourses. Natural vegetation is typical Karoo veld (Nama Karoo), dominated by scrub and shrubs, and supporting a low grass element.

As in other parts of the Karoo, the trend has been towards the progressive concentration of the population in towns and settlements. This is linked to labour/ tenure shedding on commercial farms and some diversification into game farming (mainly for hunting) - which provides fewer employment (and tenure) opportunities. Tourism in the PKSDM is currently largely linked to the Orange River valley and along major transport routes such as the N1, N9 and N12 (mainly overnight stops).

Economic sectors

The PKSDM is located centrally within South Africa, and benefits from a good road and railway network. In this regard four of the major National Routes pass through the PKSDM. The N1 and N12 routes link the two main economic centres, i.e., the Rand and the Western Cape and both these routes carry thousands of tons of valuable goods and material every day to all parts of the country. The N9 and N10 routes link Namibia and Gauteng with the coastline of Port Elizabeth, which is also the nearest export harbour for the Northern Cape Province.

The railway network around De Aar and Noupoort is one of the largest in South Africa. An average of 1 000 000 tons are conveyed through this station every month and capacity exists to increase this tonnage. On average 9 freight trains between Gauteng and the Western Cape pass through the station at De Aar every day, 4 to Port Elizabeth, 2 to Namibia and 10 from De Aar to Kimberley. The station at De Aar has direct or indirect links to virtually every corner of South Africa. One of Eskom's largest sub-stations – Hydra – is located near De Aar, supplying high voltage power especially to the Western Cape and the rural areas (PKSDM IDP).

Over the past five decades or so, commercial farming operations have tended to become larger, while progressively shedding historical labour and tenure opportunities. This has been accelerated by tenure-related legislation (e.g. the Extension of Security of Tenure Act of 1997), and the growth of the game farming industry. In addition, the national social grant and social housing allocation systems have further contributed to urbanisation of former rural populations in the ELM.

The key strengths of the PKSDM economy are community services, agriculture, transport and tourism. The towns function primarily as agricultural service centres. (UOFS; 2007). Most of the agricultural economy consists of extensive farming (sheep and goats), as

well as a growing number of game farming operations. However, there is intensive agriculture along the Orange Riet Canal System, along the upper Orange River (Colesberg-Hopetown area), and along the middle Orange River (Prieska) area. The following areas have been identified by the 2007 *Arid Areas Study* as developmental nodal points: Colesberg, De Aar, the Orange River (mainly irrigation farming and alluvial diamond mining), and the Gariep Dam (inter-provincial tourism marketing of the region) (UOFS; 2007).

The Industries in the area are mostly confined to light industries. Little beneficiation or value-adding of local produce currently takes place. Thus, for example, while the PKSDM is the largest wool producer in the country, most of the beneficiation is currently undertaken in the Eastern Cape (UOFS; 2007).

The PKSDM is currently actively promoting the DM as renewable energy hub, and hopes to become the national solar hub. It is hoped that the development of multiple SEFs in the DM would create sufficient critical mass to support the development of local solar-related manufacturing and servicing industry, and potentially even the establishment of a renewables related vocational training centre/ FET in De Aar. As such, the PKSDM has identified renewables development - and solar in particular - as a key local economic growth and development strategy, with potential spinoffs in terms of direct long term employment creation, and major potential cumulative downstream benefits in terms of local investment, manufacturing and spending, as well as local tertiary vocational training (Madyo - pers. comm).

2.3.2 Emthanjeni Local Municipality

Information provided below is mainly derived from the latest ELM IDP document (2009-2013), the 2007 Community Survey and the 2001 Census.

Dominant economic sectors (GDP)

Economically, the ELM contributed approximately 25% of the greater district's local economy in the year 2000. According to the ELM IDP, the largest sectors within the municipality are the following:

- Community Services (36%);
- Transport (24%);
- Finance (13%);
- Trade (11%);
- Agriculture (7%);
- Electricity (4%);
- Manufacturing (3%); and
- Construction (2%).

De Aar is at the centre of the economy of the Municipality. Its railway junction links Gauteng with Cape Town, Port Elizabeth, the Port at Coega, and Namibia. De Aar also has the largest abattoir in the Southern Hemisphere and the surrounding sheep farms are also major suppliers of wool for both the local and international market.

De Aar is the seat of the PKSDM and ELM. De Aar is the undisputed regional hub. Many national retailers are represented, and people from the Hanover area typically do their shopping and business in De Aar. The historic importance of De Aar as South Africa's largest rail junction means that De Aar is well-equipped with industrial workshops.

2.3.3 Hanover

Hanover is the nearest Emthanjeni town to the Klipgat site. The town is located off the N1, midway between Cape Town and Johannesburg (~750 km). The N10 to De Aar and Middelburg, is located just to the south of Hanover. The town claims to be the most centrally located place in South Africa, and is famously associated with the author Olive Schreiner who called it “the prettiest little village I have ever seen” (PKSDM, 2010).

The town was founded in 1876 at the site of a strong fountain on the farm Petrusvallei, mainly to provide a centre for the sizable white farming community which had accumulated in the area then known as the Bo-Zeekoerivier, an outlier of the Graaff-Reinet magisterial district. The town was named after the original farm owner’s town of origin (Hannover in Germany), and planted with pepper trees (*Schinus molle*) to provide shade. The town’s Dutch Reformed Church (1907) is widely regarded as one of the most beautiful in the country (Erasmus, 1995).

The town’s population was ~1 500 in 2001, but has certainly increased substantially since, mainly as a result of farm workers moving into town. To give an indication, the housing backlog for Hanover is currently 741 units (Joka – pers. comm). The bulk of the town’s population currently reside to the east of the historic town, in Joe Slovo, Kwezi and other areas, separated from the historic town by a buffer of undeveloped land (Photograph 2.2). Guest houses, B&Bs and limited retail facilities are located in the historic part of town.



Photograph 2.2: Market Street in Joe Slovo, Hanover

The town’s economy is based on government services, local agriculture, and some guest accommodation facilities, catering mainly to stop-over travelers on the N1. Opportunities associated with the local agricultural sector are limited as a result of non-intensive livestock farming based operations. Further opportunities are seasonal (shearing), or temporary (road maintenance projects on N1 and N10). Seven guest accommodation

facilities are located in Hanover, but stays are typically en-route overnight stops, with little further spending in the town.

Unemployment has been identified as the key issue with regard to the Hanover community (Joka, Stonga, Thomas – pers. comm). Functional unemployment/ underemployment is estimated as high as 80%. Mainly the youth is affected. The need for stable employment opportunities has been identified as a key community need (Joka – pers. comm).

2.3.4 Hanover rural area

The Hanover district is traditionally known as one of the best wool, producing areas in South Africa, and the Colesberg area to the north for horse breeding (Erasmus, 1995). The area is still predominantly used for commercial livestock farming, but less so for breeding horses. Sheep farming forms the backbone of most operations, but is increasingly becoming supplemented with beef cattle – mainly to utilize grazing located along public roads, where sheep are vulnerable to theft. Game farming is also becoming established as a supplementary activity, but currently caters mainly to biltong hunters.

Economically viable properties are large, ~5000 - 6000 ha, and typically multi-farmed. In consequence, many historical farms are now used as stock posts, and are no longer inhabited (Malherbe – pers. comm). No accommodation, agro- or eco-tourism facilities are currently located in the Hanover area east of the N1 and west of Noupoort.

2.4 DEMOGRAPHIC OVERVIEW

The PKSDM's total population was estimated at 166 849 people, with the ELM accounting for ~23% (38 228) of that figure (Community Survey, 2007). The average population growth between 2001 and 2010 was estimated at 0.60% (ELM IDP, 2010) (Table 2.2).

Table 2.2: Population breakdown for the PKSDM (Source: PKSDM IDP 2008/2009)

Municipality	Population	Households	Average household size	% Females
Emthanjeni	35 549 ♦	7 761	4.58	52%
Kareeberg	9 486	2 258	4.20	53%
NCDMA07	3 175	887	3.58	45%
Renosterberg	9 069	2 278	3.98	51%
Siyancuma	35 809 ♦	7 383	4.85	51%
Siyathemba	17 513	4 111	4.26	51%
Thembelihle	13 986	2 988	4.68	51%
Ubuntu	16 376	3 521	4.65	52%
Umsobomvu	23 640 ♦	5 083	4.65	52%
Pixley	164 603	36 270	4.52	51%

In 2001, approximately 92% of the population in the ELM lived in the three major urban centers of De Aar, Britstown and Hanover. Given the size of the Municipality and the relatively small total population size, the population density within the Municipality generally is low at 3.4 people per km². However, the population density in the three

urban nodes of De Aar, Brits town and Hanover can be expected to be significantly higher than that of the surrounding rural areas. According to the ELM IDP (2010), the municipal population is largely Coloured (57.5%), followed by Black African (35.3%), White (7.1%) and Asian (<1%).

Notwithstanding the low population growth, the prevalence rate of HIV is a major factor in shaping future population estimates. The HIV/AIDS prevalence rate of PKSDM in 2001 was only marginally lower than the Northern Cape average (14.4% compared to 15.85% respectively), and well below the South African prevalence rate of 24.5%. Although not high by comparison to South Africa the PKSDM IDP notes that HIV/AIDS will impact on the growth and welfare of the PKSDM population.

Age Profile

The age structure of the PKSDM population is similar to that of the NCP, with ~ 16% of the population between 0-6 years old, while 8% are 60 years old or older. A further 31% are in the school going age group of 7 to 19 years. The economically active age group of 20 to 59 years old accounts for almost half the population (46%). The implications of this population structure are a higher demand on the provision of social and physical facilities, like schools, primary health care centres, etc. in the district (PKSDM IDP 2008/2009).

The age profile of the ELM population indicates that approximately 65.2% of the population falls within the economically active age bracket of between 15-64 years of age. Approximately 30% of the population is 15 years old or less while the remaining 5% of the population are 64 years old or older. According to the Municipal IDP, 31% of the population falls within the school going age group of 7 to 19 years.

Education

Broadly, the level of education within the ELM is low. In 2001 just under 20% of the population (1 in 5) had no schooling, while approximately 1/10 of those who completed some form of Secondary education (~36%) progress to obtain education at University/Technikon level (~3.5%). Between 2001 and 2007, the education levels improved marginally with the number of people who had no form of education decreasing to 15% and those who completed some form of tertiary education increasing to just over 5%.

According to the Municipal Profiles of 2002, the primary school population represented 46.3 % of the total population of the district. There are 49 primary schools and 18 secondary schools and combined schools in the district. While the actual number of schools is generally satisfactory there is an acute shortage of schools in the remote areas of the district. As a result children often have to walk long distances to reach schools (PKSDM IDP 2008/2009).

Employment

Unemployment within the ELM is estimated at 23.1% of the total labor force, which is below the Northern Cape average of ~27% while 43.5% of the population is not economically active¹. The latter are made up of made up of scholars/students, homemakers/housewives, pensioners, the medically unfit, seasonal workers not currently employed, and those who choose not to work. The ELM IDP and supporting

¹ The term "not economically active" refers to people of working age not actively participating in the economy, such as early retirees, students, the disabled and home-makers.

documents do not provide any detail regarding the relative size of the each of the economic sector's contribution to employment in the ELM.

In terms of employment the agricultural sector was the most important economic sector in the PKSDM accounting for ~39 % of the total working population. The commercial services sector accounted for ~23 % of the employment opportunities. These two sectors combined therefore accounted for ~ 62 % of all the employment opportunities in the area.

Although the PKSDM only had an official unemployment rate of ~21%, household income levels in the region are low. In this regard ~ 64% of households had an income of R1 000 or less per month compared to the Northern Cape average of 54% of households below this level. The figure for the ELM is ~ 69% (Table 2.3). The PKSDM also has the highest percentage of households (48 %) in the Northern Cape Province that earn less than R 800 per month, which is regarded as the poverty breadline in South Africa (Figure 2.1) (PKSDM IDP 2008/2009). In 2005/6, there was a total of 31 726 indigent households in PKSDM, which amounted to 42% of all households. This indicates the high level of poverty in the district.

Table 2.3: Household income levels in the 8 LMs that make up the PKSDM

Municipality	R500 and below	R501-1000	R1001-1500	Above R1500
Emthanjeni	37%	17%	13%	34%
Kareeberg	45%	22%	11%	22%
NCDMA07	39%	27%	12%	22%
Renosterberg	49%	20%	10%	21%
Siyancuma	50%	19%	11%	20%
Siyathemba	40%	23%	13%	25%
Thembelihle	41%	22%	12%	25%
Ubuntu	44%	22%	12%	22%
Umsobomvu	53%	18%	11%	18%
PIXLEY	44%	20%	12%	24%
Northern Cape	36%	18%	13%	34%

Source: PKSDM IDP 2008/2009

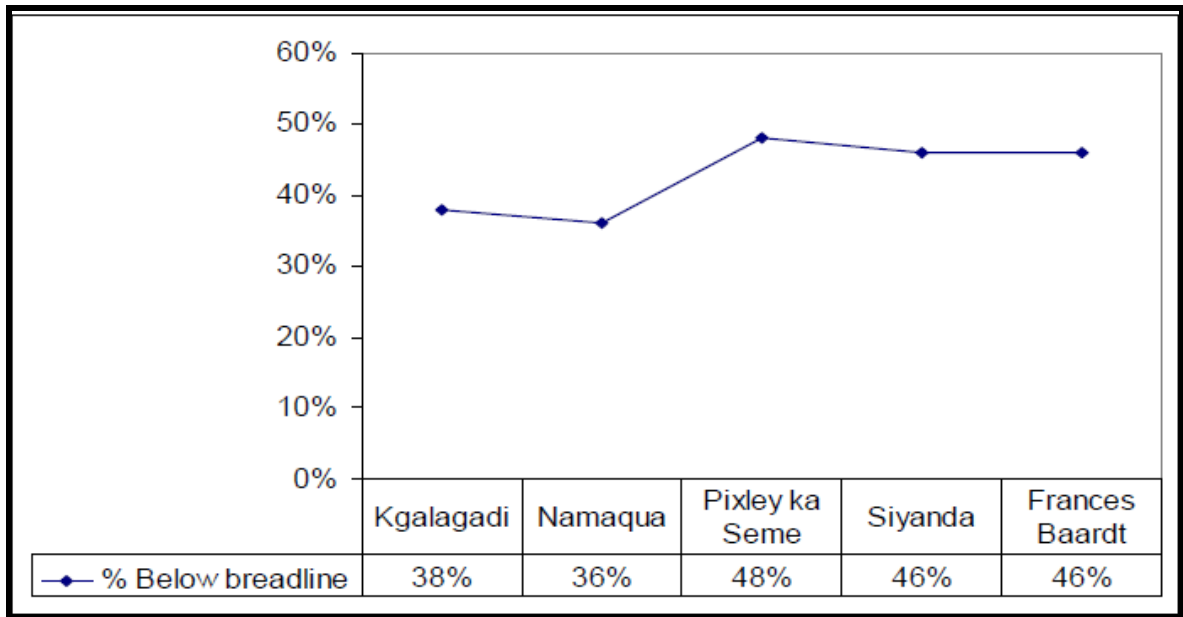


Figure 2.1: Percentage of households with an income below the poverty breadline by district within the Northern Cape Province (Source: PKSDM IDP 2008/2009).

2.5 LOCAL SITE CONDITIONS AND SURROUNDING LAND USES

The proposed SEF site is located on Klipgat 2/80, 848 ha in extent, and one of a number of farms which form part of Holvlakte farm located on the adjacent Holvlakte 82 to the south of the Dwaal railway line. Up to 225 ha (30 ha/ 10 MW x 75 MW) of Klipgat would be needed to accommodate the SEF. Klipgat is traversed by an existing 132 kV line, and only a short link-in line (<500 m) would be required from the proposed on-site substation. Klipgat is currently used for grazing, mainly by sheep (Photograph 2.3). Infrastructure includes a stock watering point (not affected by proposed SEF footprint) and perimeter fencing. The grazing resource is similar to that on Holvlakte's other farms (Minnaar – pers. comm). The SEF footprint would be ~ 2 km from the Holvlakte farmstead, and the proposed on-site substation ~2.5 km.

The owner, Mr. Handré Nieuwoudt and his family reside on Holvlakte (Photograph 2.3). Holvlakte employs one tenured employee and his family. Casual workers are transported in as required from Hanover. Operations are primarily based on sheep (wool merinos and carcass dorpers), but the property also accommodates some game (eland, wildebeest, etc) for limited commercial biltong hunting. Alfalfa grown under irrigation near the Holvlakte farmstead is essentially for the operation's own fodder needs (Minnaar – pers. comm).



Photograph 2.2: Sheep on Holvlakte



Photograph 2.3: Farm house and yard buildings on Holvlakte

Farms in the adjacent area are used for commercial livestock and supplementary game farming. Inhabited farm houses are typically located at some distance from one another, and with regard to the Klipgat site, all with the exception of Holvlakte appear to be located ~5 km from the site (Figure 2.2). This, together with the proposed SEF's low profile (<5 m), and topographical screening factors, would probably mean that the SEF would not be visible from adjacent farmsteads. The bulk of Holvlakte's neighbors are not located in meaningful proximity to the Klipgat site. The exceptions are Klipgat 80 REM and Poortjie/ Vlakplaas, located to the west of the Klipgat site. In as far as could be established, the properties are used for stock grazing, and neither owner reside on their property. A farm laborer currently resides on Poortjie/ Vlakplaas. The owner has indicated that he eventually hopes to move to Vlakplaas, but that his wife's health currently requires them to reside in Bloemfontein (Stevens – pers. comm).

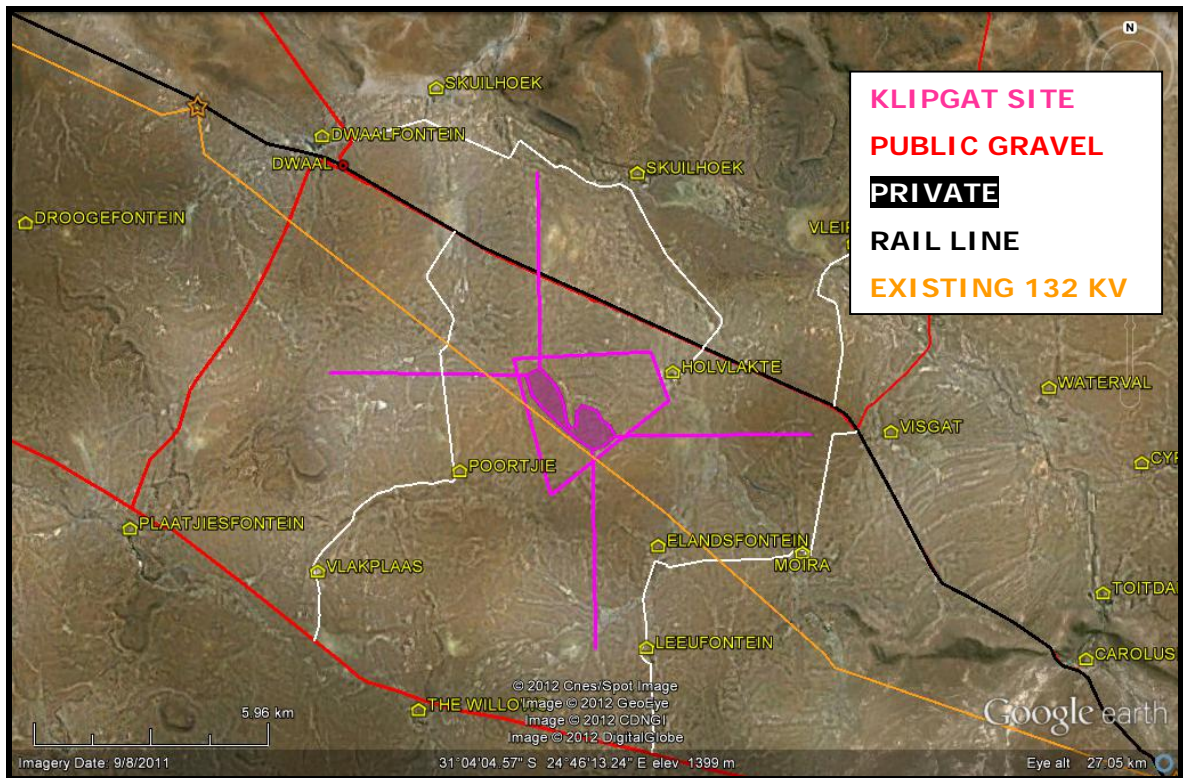


Figure 2.2: Klipgat site in relation to farm houses, roads, rail line and existing 132 kV

SECTION 3: POLICY AND PLANNING ENVIRONMENT

3.1 INTRODUCTION

Section 3 of this Social Study Report provides an overview of the most significant policy documents of relevance to the proposed Klipgat SEF development. Arranged thematically, these are:

National and Provincial level Renewable Energy Policy

- National Energy Act (2008);
- National White Paper on Renewable Energy (2003);
- National Integrated Resource Plan for Electricity (2010-2030);
- Northern Cape Climate Change Response Strategy (in progress).

Provincial and local level Spatial Policy and SEF siting criteria

- Northern Cape Spatial Development Framework, Vol 2 (2011).

Provincial and local level Socio-Economic Developmental Policy

- Northern Cape Provincial Growth and Development Strategy Draft 4 (2011);
- Pixley ka Seme District Municipality Integrated Development Plan 2012-2016;
- Emthanjeni Local Municipality Integrated Development Plan 2012-2013; and
- Emthanjeni Tourism Strategy 2010-2020.

3.1 NATIONAL AND PROVINCIAL LEVEL RENEWABLE ENERGY POLICY

3.1.1 National Energy Act (Act 34 of 2008)

The National Energy Act was promulgated in 2008. One of the objectives of the Act was to promote diversity in energy supply and its sources. In this regard, the objectives of the Act, as stated in the preamble, make direct reference to facilitating the “increased generation and consumption of renewable resources”.

3.1.2 The National White Paper on Renewable Energy (2003)

This White Paper on Renewable Energy (further referred to as the White Paper) supplements the *White Paper on Energy Policy (1998)*, which recognized the significant medium and long-term potential of renewable energy. The 2003 White Paper sets out Government’s vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa.

As signatory to the Kyoto Protocol, Government is determined to achieve its statement commitment to reducing greenhouse gas emissions. To this purpose, Government has committed itself to the development of a framework in which a national renewable energy framework can be established and operated.

Apart from the reduction of greenhouse gas emissions, the promotion of renewable energy sources is aimed at ensuring energy security through the diversification of supply (in this regard, also refer to the objectives of the National Energy Act).

Government's long-term goal is the establishment of a renewable energy industry producing modern energy carriers that will offer in future years a sustainable, fully non-subsidized alternative to fossil fuels.

The medium-term (10-year) target set in the White Paper is:

*10 000 GWh (0.8 Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, **solar** and small-scale hydro. The renewable energy is to be utilized for power generation and non-electric technologies such as solar water heating and bio-fuels. This is approximately 4% (1667 MW) of the projected electricity demand for 2013 (41539 MW) (Executive Summary, ix).*

3.1.3 Integrated Resource Plan for Electricity (2010-2030)

The current iteration of the Integrated Resource Plan (IRP) for South Africa, initiated by the Department of Energy (DoE) after a first round of public participation in June 2010, led to the Revised Balanced Scenario (RBS) that was published in October 2010. The document outlines the proposed generation new build fleet for South Africa for the period 2010 to 2030. This scenario was derived based on the cost-optimal solution for new build options (considering the direct costs of new build power plants), which was then "balanced" in accordance with qualitative measures such as local job creation. In addition to all existing and committed power plants, the RBS included a nuclear fleet of 9,6 GW; 6,3 GW of coal; 11,4 GW of renewables; and 11,0 GW of other generation sources.

A second round of public participation was conducted in November/December 2010, which led to several changes to the IRP model assumptions. The main changes were the disaggregation of renewable energy technologies to explicitly display solar photovoltaic (PV), concentrated solar power (CSP) and wind options; the inclusion of learning rates, which mainly affected renewables; and the adjustment of investment costs for nuclear units, which until then represented the costs of a traditional technology reactor and were too low for a newer technology reactor (a possible increase of 40%).

Additional cost-optimal scenarios were generated based on the changes. The outcomes of these scenarios, in conjunction with the following policy considerations, led to the Policy-Adjusted IRP:

- The installation of renewables (solar PV, CSP and wind) were brought forward in order to accelerate a local industry;
- To account for the uncertainties associated with the costs of renewables and fuels, a nuclear fleet of 9,6 GW was included in the IRP;
- The emission constraint of the RBS (275 million tons of carbon dioxide per year after 2024) was maintained;
- Energy efficiency demand-side management (EEDSM) measures were maintained at the level of the RBS.

The Policy-Adjusted IRP includes the same amount of coal and nuclear new builds as the RBS, while reflecting recent developments with respect to prices for renewables. In addition to all existing and committed power plants (including 10 GW committed coal), the plan includes 9,6 GW of nuclear; 6,3 GW of coal; 17,8 GW of renewables; and 8,9 GW of other generation sources. The Policy-Adjusted IRP has therefore resulted in an increase in the contribution from renewables from 11,4 GW to 17,8 GW.

Table 3.1 indicates the new capacities of the Policy commitment. The dates shown in Table 3.1 indicate the latest that the capacity is required in order to avoid security of supply concerns. The document notes that projects could be concluded earlier than indicated.

Table 3.1: Commitments before next IRP

	New build options							
	Coal (PF, FBC, imports, own build)	Nuclear	Import hydro	Gas – CCGT	Peak – OCGT	Wind	CSP	Solar PV
	MW	MW	MW	MW	MW	MW	MW	MW
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	300
2013	0	0	0	0	0	0	0	300
2014	500 ¹	0	0	0	0	400	0	300
2015	500 ¹	0	0	0	0	400	0	300
2016	0	0	0	0	0	400	100	300
2017	0	0	0	0	0	400	100	300
2018	0	0	0	0	0	400 ⁴	100 ⁴	300 ⁴
2019	250	0	0	237 ²	0	400 ⁴	100 ⁴	300 ⁴
2020	250	0	0	237 ²	0	400	100	300
2021	250	0	0	237 ²	0	400	100	300
2022	250	0	1 143 ²	0	805	400	100	300
2023	250	1 600	1 183 ²	0	805	400	100	300
2024	250	1 600	283 ²	0	0	800	100	300
2025	250	1 600	0	0	805	1 600	100	1 000
2026	1 000	1 600	0	0	0	400	0	500
2027	250	0	0	0	0	1 600	0	500
2028	1 000	1 600	0	474	690	0	0	500
2029	250	1 600	0	237	805	0	0	1 000
2030	1 000	0	0	948	0	0	0	1 000
Total	6 250	9 600	2 609	2 370	3 910	8 400	1 000	8 400

Firm commitment necessary now
 Final commitment in IRP 2012

1. Built, owned & operated by IPPs 2. Commitment necessary due to required high-voltage infrastructure, which has long lead time 3. Commitment necessary due to required gas infrastructure, which has long lead time 4. Possibly required grid upgrade has long lead time and thus makes commitment to power capacity necessary

Source: Integrated Resource Plan (IRP) for South Africa

The key recommendations contained in the Policy-Adjusted IRP Final Report (March 2011) that have a bearing on the renewable energy sector include:

General

- The dark shaded projects in Table 3.1 need to be decided before the next IRP iteration, with the identified capacities thereafter assumed as “committed” projects;
- The light shaded options should be confirmed in the next IRP iteration;
- All non-shaded options could be replaced during the next, and subsequent, IRP iterations if IRP assumptions change and thus impact on the quantitative model results.

PV Solar energy

- Solar PV programme 2012-2015: In order to facilitate the connection of the first solar PV units to the grid in 2012 a firm commitment to this capacity is necessary. Furthermore, to provide the security of investment to ramp up a sustainable local industry cluster, the first four years from 2012 to 2015 require firm commitment; and
- Solar PV 2016 to 2019: Grid upgrades might become necessary for the second round of solar PV installations from 2016 to 2019, depending on their location. To trigger the associated tasks in a timely manner, a firm commitment to these capacities is

necessary in the next round of the IRP at the latest. By then, the assumed cost decreases for solar PV will be confirmed.

Conclusions

The key conclusions that are relevant to the renewable energy sector include:

- An accelerated roll-out of renewable energy options should be allowed in order to derive the benefits of localisation in these technologies; and
- A solar PV programme as envisaged in the Policy-Adjusted IRP should be pursued (including decentralised generation).

3.1.4 Northern Cape Climate Change Response Strategy

The NCPG appears to be in the process of finalising its Provincial Climate Change Response Strategy (NCPCCRS). In this regard, completion of a Draft document was announced in March 2011, and finalisation of the report anticipated after the 2011 COP17, by the end of 2011. Neither document appears to have been released by this date.

The key aspects of the Draft PCCRS Report are however summarised in the MEC's (NCPG: Environment and Nature Conservation) 2011 budget speech: "The Provincial Climate Change Response Strategy will be underpinned by specific critical sector climate change adaptation and mitigation strategies that include the Water, Agriculture and Human Health sectors as the 3 key Adaptation Sectors, the Industry and Transport alongside the Energy sector as the 3 key Mitigation Sectors with the Disaster Management, Natural Resources and Human Society, livelihoods and Services sectors as 3 remaining key Sectors to ensure proactive long term responses to the frequency and intensity of extreme weather events such as flooding and wild fire, with heightened requirements for effective disaster management".

Key points from MEC Lucas' address include the NCPG's commitment to develop and implement policy in accord with the National Green Paper for the National Climate Change Response Strategy (2010), and an acknowledgement of the NCP's extreme vulnerability to climate-change driven desertification. The development and promotion of a provincial green economy, including green jobs, and environmental learner ships is indented as an important provincial intervention in addressing climate change. The renewable energy sector, including **solar** and wind energy (but also biofuels and energy from waste), is explicitly indicated as an important element of the Provincial Climate Change Response Strategy. The MEC further indicated that the NCP was involved in the processing 7 WEF and 11 SEF EIA applications (March 2011)².

3.2 SPATIAL POLICY AND SEF SITE SELECTION CRITERIA

3.2.1 Northern Cape Provincial Spatial Development Framework (2011)

Dennis Moss Partnership is currently preparing a Provincial Spatial Development Framework (PDSF) for the Northern Cape Province (NCP) The PSDF is a legal requirement in terms of Chapter 4 of the Northern Cape Planning and Development Act 7 of 1998.

² (www.info.gov.za/speech/DynamicAction?pageid=461&sid=22143&tid=45200).

Volumes 1 and 2 were finalised in December 2011. Volumes 1 and 2 are essentially introductory, status quo reports. Volume 2 provides a situation analysis of the NCP, mainly with the view of identifying key aspects for policy focus/ intervention. Volumes 3 (Spatial Directives) and 4 (Strategies) are currently in preparation, and no Draft documents are available at this stage.

Volume 2 (Situation Analysis and Key Aspects) indicates that the envisaged Spatial Directives and Strategies reports would be closely aligned to the 2004-2014 Northern Cape Provincial Growth and Development Strategy (PGDS) (currently in Draft 4)³. Volume 2 includes an overview of some key relevant aspects of the PGDS Draft 4, including with regard to the roles of renewable energy and tourism in the provincial economy.

Renewable Energy

The PSDF (Vol 2) notes that, at present, the Eskom Vanderkloof hydro station on the Orange River (240 MW) represents the only large energy-generating facility in the NCP. Most of the energy used in the province is generated by Eskom plants located elsewhere, mainly Mpumalanga Province. The PSDF therefore notes that the NCP's major energy challenges include securing energy supply to meet growing demand, providing everybody with access to energy services and tackling the causes and impacts of climate change (as per PGDS). In this regard, the development of large-scale renewable energy supply schemes is strategically important for increasing the diversity of domestic energy supplies for the NCP, and avoiding energy imports while minimizing the environmental impacts.

The PSDF further notes that renewable energy has been identified in the Draft 4 PGDS (2011) as a mechanism to diversify the economy and thereby promote a green economy in the province. According to the PGDS, greening the economy is characterized by substantially increased investments in economic sectors (NCPG; 2011: F.1.4.1). Vol. 2 of the PSDF indicates that the promotion of job creation in the green jobs industries (e.g. manufacturing of solar water heaters, maintenance of wind generators and solar energy infrastructure) would be promoted in the forthcoming spatial directives and strategies reports (Volumes 3-4).

Renewable energy

The PSDF notes that, according to the PGDS the NCP has considerable potential for renewable energy generation, including solar energy.

Tourism

The PSDF notes that the tourism sector is identified in the Draft 4 PGDS as one of the key sectors with the capacity to 'grow, transform and diversify the provincial economy'. According to the PGDS, the vision for tourism is underpinned by a number of broad, essential and specific drivers. The 'broad drivers' consider the 'big picture' focusing on tourism's contribution to a larger development purpose, including overall economic growth, addressing social up-liftment and poverty alleviation through facilitating job creation, and striving for more equitable ownership and participation in tourism through transformation.

Comparative advantages of the NCP are identified as mainly eco-tourism opportunities, including unique sectoral or nature-based routes; National parks, nature reserves and

³ Draft 4 (2011) of the PGDS does not seem to have been made public yet.

game reserves, Natural and cultural manifestations, as well as festivals and cultural events (PGNC; 2011b).

3.3 PROVINCIAL AND LOCAL SOCIO-ECONOMIC DEVELOPMENT POLICY

3.3.1 Northern Cape Province Provincial Growth and Development Strategy

The Provincial Growth and Development Strategy (PGDS) notes that the most significant challenge that the government and its' partners in growth and development are confronted with is the reduction of poverty. All other societal challenges that the province faces emanate predominantly from the effects of poverty. The PGDS notes that the only effective way to reduce poverty is through long-term sustainable economic growth and development. The sectors where economic growth and development can be promoted include:

- Agriculture and Agro-processing;
- Fishing and Mariculture;
- Mining and mineral processing;
- Transport;
- Manufacturing;
- Tourism.

However, the PGDS also notes that economic development in these sectors also requires:

- Creating opportunities for lifelong learning;
- Improving the skills of the labour force to increase productivity;
- Increasing accessibility to knowledge and information.

The achievement of these primary development objectives depends on the achievement of a number of related objectives that, at a macro-level, describe necessary conditions for growth and development. These are:

- Developing requisite levels of human and social capital;
- Improving the efficiency and effectiveness of governance and other development institutions;
- Enhancing infrastructure for economic growth and social development.

Of specific relevance to the SIA the NCPGDS make reference to the need to ensure the availability of inexpensive energy. The section notes that in order to promote economic growth in the Northern Cape the availability of electricity to key industrial users at critical localities at rates that enhance the competitiveness of their industries must be ensured. At the same time, the development of new sources of energy through the promotion of the adoption of energy applications that display a synergy with the province's natural resource endowments must be encouraged. In this regard the NCPGDS notes "the development of energy sources such as solar energy, the natural gas fields, bio-fuels, etc., could be some of the means by which new economic opportunity and activity is generated in the Northern Cape". The NCPGDS also highlights the importance of close co-operation between the public and private sectors in order for the economic development potential of the Northern Cape to be realised.

The NCPGDS also highlights the importance of enterprise development, and notes that the current levels of private sector development and investment in the Northern Cape

are low. In addition, the province also lags in the key policy priority areas of SMME Development and Black Economic Empowerment. The proposed SEF therefore has the potential to create opportunities to promote private sector investment and the development of SMMEs in the NCP.

In this regard care will need to be taken to ensure that the proposed SEF and other renewable energy facilities do not negatively impact on the regions natural environment. In this regard the NCPGDS notes that the sustainable utilisation of the natural resource base on which agriculture depends is critical in the Northern Cape with its fragile ecosystems and vulnerability to climatic variation. The document also indicates that due to the provinces exceptional natural and cultural attributes, it has the potential to become the preferred adventure and ecotourism destination in South Africa. Care therefore needs to be taken to ensure that the development of large renewable energy projects, such as the proposed SEF, do not affect the tourism potential of the province. The potential impact on heritage sites may also have social implications.

3.3.2 Pixley ka Seme District Municipality Integrated Development Plan 2012-2016

The vision for the Pixley ka Seme District Municipality as set out in the IDP is to “commit ourselves to be a developmental municipality where the quality of life of all people in the district will be improved”.

In terms of the mission statement, the PKSDM sets out to achieve -

- Efficient service delivery;
- Optimal human and natural resource development;
- Local economic growth and development, job creation and poverty alleviation;
- A vibrant tourism industry and;
- A safe, secure and community friendly environment.

Key developmental challenges identified for the PKSDM most likely to have a fundamental effect on the long-term economic viability of the district include:

- Optimizing on the opportunities presented by the region’s geo-political location between Cape Town, Bloemfontein, Johannesburg and Pretoria, which are among the most important cities in South Africa;
- Optimizing on the opportunities presented by the N1, N12, N9 and N10 corridors, which already transport many tourists, goods and services throughout the year through the region;
- The potential opportunities of the proposed renewable energy hub in the region;
- The HIV/AIDS pandemic and its impact on regional demographics;
- Management of investor risk, and where necessary, direct intervention in order to attract international capital;
- The maintenance and preservation of pristine environment; and
- High levels of unemployment and poverty (PKSDM; 2012: 110).

Key objectives and strategies of relevance to the proposed SEF development include:

LED, Tourism and Poverty Alleviation:

Key identified challenges include high levels of poverty and low skills levels; and a relatively undiversified economy, relying mainly on primary sector activities.

Key interventions would include promoting SMMEs; attracting and retaining investors in the region; development of identified development corridors; value-adding to/beneficiation of local produce; and the promotion of tourism development. Policies/targets aimed at addressing these challenges include:

- LED1: Promote Local Economic Development in the region;
- LED 2: Increase SMME promotion;
- LED 4: Increased tourism promotion – a Tourism Market Strategy should be compiled to attract investments and tourists;
- LED 6: Reduce employment and poverty by 50% each, respectively in the region by 2014.

HIV/ AIDS:

Key identified challenges include low awareness levels, inadequate health care facilities, including a lack of trained professionals, mobile clinics, a hospice, etc.

- Policy HIV 1 focuses on reducing the level HIV/AIDS infections amongst young men and women in the District.

Education, Youth and development:

Key identified challenges include limited or no access to higher learner institutions; lack of IT skills in the region; poor qualification and skills of the community limiting their entry to institutions of higher learning; very few training facilities in the region; and a lack of funds available to the majority of learners.

- Policy Y1 focuses on improving the well-being of young men and women, including improving access to vocational training (Y1.2).

Safety and security:

Key identified challenges include high endemic levels of family and child abuse; and high levels of alcohol abuse.

- Policy SS1 provides for the promotion of a safe and secure environment in the District.

Renewable Energy Hub

The Pixley ka Seme District Municipality convened a conference on investment and renewable energy which was held from the 14th to the 16th of September 2010. The intention of the conference was to provide insight around virgin opportunities that could be exploited in key sectors of the district economy, namely: mining, tourism, manufacturing, retail, agriculture and agro-processing and also in the renewable energy sector, namely: solar, wind, hydro, bio-mass, bio-digestion and geo-thermal development. The investment and renewable conference took resolutions on matters including Infrastructure development and Rural industrialization and development zones (PKSDM; 2012: 176).

The PKSDM Local Economic Development (LED) has indicated The DM is currently actively promoting itself as renewable energy hub, and hopes to become the national solar hub. It is hoped that the development of multiple SEFs in the DM would create sufficient critical mass to support the development of local solar-related manufacturing and servicing industry, and potentially even the establishment of a renewables related vocational training centre/ FET in De Aar. As such, the PKSDM has identified renewables

development - and solar in particular – as a key local economic growth and development strategy, with potential spinoffs in terms of direct long term employment creation, and major potential cumulative downstream benefits in terms of local investment, manufacturing and spending, as well as local tertiary vocational training. Spatially, concentration of facilities is envisaged in the De Aar area, but also including Prieska, Hannover and Noupoot. Unlike the Gariep/ Orange River valley located to the north (mooted as “Karoo riviera”), the relevant area is not considered visually sensitive (Madyo – pers. comm).

3.3.3 Emthanjeni Local Municipality Integrated Development Plan 2012-2013

The ELM IDP (2012) identifies a number of key performance areas (KPAs) in line with National guidelines. These KPAs address the outcome of an analysis of the status quo across numerous sectors within the ELM and include the following:

- Basic Service Delivery;
- Local Economic Development;
- Environmental Management;
- Social Development;
- Good Governance and Public Participation;
- Safety and Security;
- Cross-Cutting Issues;
- Municipal Financial Viability and Management; and
- Municipal Institutional Transformation.

These KPAs aim to utilize existing economic strengths and opportunities by transferring these into workable programmes and projects. These programmes and projects tend to reduce the current threats, and strengthen the weaknesses in the local economic environment. The IDP KPAs that are relevant to the proposed PVSEF include:

- Basic Service Delivery: Energy is highlighted as one of the priority issues for the ELM with respect to basic services; and,
- Local Economic Development (LED): Micro and macro-economic development and land use management are highlighted as one of the priority issues for the ELM with respect to LED.

The Municipality identified a number of industrial and manufacturing projects that form part of their strategy for the economic development of the ELM. These include amongst others:

- The development of N10 Corridor;
- Revitalization of the rail infrastructure;
- Development of industrial sites (Hanover / Britstown);
- Urban Renewal Programme (Renewal of Townships);
- A Logistics hub (De Aar); and
- A Renewable Energy hub (De Aar).

3.3.4 Emthanjeni Tourism Strategy 2010-2020

Dedicated tourism flows to the Emthanjeni are currently limited. Hanover is located along the N1, and mainly attracts stop-over traffic at the higher end of the market. A ten-year tourism development strategy for the period 2010-2020 was developed by Creative Harvest (De Aar) for the Emthanjeni LM in 2010, under the auspices of key policy documents including Emthanjeni Tourism Policy, Pixley ka Seme District

Municipality and the Northern Cape Growth and Development Strategy. This is in recognition of the immense contribution of tourism to the growth of the Province in general and in particular to local economy (Emthanjeni, 2010).

The document notes significant underdevelopment of tourism infrastructure in the ELM, coupled to a general lack of trained human resources. The ELM's strategic location, heritage assets and wide open spaces (including for hunting) are emphasised as key anchors. Key growth opportunities include:

- Leisure tourism – farm stays and site seeing associated with heritage assets (e.g. Olive Schreiner cottage in Hanover);
- MICE - Meetings, Incentives, Conferences and Events (linked to Hanover and De Aar's central locations and good road access);
- General Business – sale, meetings and trainings;
- Stimulating local retail.

Implementation over the 2010-2020 period is envisaged in three phases:

- Phase 1 would focus on addressing infrastructural, HR and other identified weaknesses to transform the Municipality into a leisure tourism destination;
- Phase 2 will gravitate into MICE tourism;
- Phase 3 will concentrate on developing Emthanjeni into general business tourist destination.

The Tourism Plan focuses mainly on urban heritage associated with De Aar, Hanover and Britstown. Comment from the PKSDM LED Manager, the ELM Mayor and the Umsobomvu spatial planner indicated that the Klipfontein study area is not considered sensitive in terms of tourism development. The scenic quality of the area, associated with vast open spaces and Karoo koppies, is replicated elsewhere in the ELM (Madyo, Stonga, Malherbe – pers. comm).

SECTION 4: ASSESSMENT OF KEY ISSUES

4.1 INTRODUCTION

Section 4 identifies the key social issues identified during the SIA study. The identification of social issues was based on:

- The Social Scoping Report prepared for the Scoping Report (Tony Barbour and Schalk van der Merwe, April, 2012);
- Review of project related information, including other specialist studies;
- Interviews with key interested and affected parties;
- Experience of the authors of the area and the local conditions; and
- Experience with similar projects.

In identifying the key issues the following assumption is made:

- The area identified for the proposed SEF meets the technical criteria required for such facilities.

4.2 IDENTIFICATION OF KEY SOCIAL ISSUES

The key social issues identified during the SIA can be divided into:

- The policy and planning related issues
- Local, site-specific issues

The local site-specific issues can in turn be divided into construction and operational related issues. These issues are discussed and assessed below.

4.3 POLICY AND PLANNING ISSUES

As indicated in Section 1.5, legislative and policy context plays an important role in identifying and assessing the potential social impacts associated with a proposed development. In this regard a key component of the SIA process is to assess the proposed development in terms of its fit with key planning and policy documents.

The review of the relevant planning and policy documents was undertaken as a part of the SIA. The key documents reviewed included:

- The National Energy Act (2008);
- The White Paper on the Energy Policy of the Republic of South Africa (December 1998);
- The White Paper on Renewable Energy (November 2003);
- Integrated Resource Plan (IRP) for South Africa (2010-2030);
- Northern Cape Provincial Growth and Development Strategy (2004-2014);
- Northern Cape Climate Change Response Strategy (in progress);
- Northern Cape Spatial Development Framework, Vol. 2 (2011);

- Pixley ka Seme District Municipality Integrated Development Plan 2010-2011;
- Pixley ka Seme District Municipality Integrated Development Plan 2012-2016;
- Emthanjeni Local Municipality Integrated Development Plan 2012-2013;
- Emthanjeni Tourism Strategy 2010-2020.

The findings of the review indicated that solar energy is strongly supported at a national and local level. At a national level the White Paper on Energy Policy (1998) notes:

- Renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future;
- The support for renewable energy policy is guided by a rationale that South Africa has a very attractive range of renewable resources, particularly **solar** and wind and that renewable applications are in fact the least cost energy service in many cases; more so when social and environmental costs are taken into account.

At a provincial level the NCPGDP notes that availability of inexpensive energy is a key requirement in order to promote economic growth in the Northern Cape. The NCGDS goes on to indicate that "the development of energy sources such as **solar energy**, the natural gas fields, bio-fuels, etc., could be some of the means by which new economic opportunity and activity is generated in the Northern Cape". The IRP 2010 also allocates 43% of energy generation in South Africa to renewables.

At a local level the PkSDM IDP identifies the promotion and utilization of renewable energy as core initiative that influences its policies, objectives, strategies and projects. As such, the proposed PV facility could play an important role in the District realising some of its key IDP objectives. The ELM IDP also identifies alternative energy projects as a key driver for local economic development. The IDP also identifies De Aar as a **Renewable Energy Hub**.

Based on this it is reasonable to assume that the establishment of PVSEF's is supported. However, the NCPGDS also states that the sustainable utilisation of the natural resource base on which agriculture depends is critical in the Northern Cape with its fragile ecosystems and vulnerability to climatic variation. The document also indicates that due to the Province's exceptional natural and cultural attributes, it has the potential to become the preferred adventure and ecotourism destination in South Africa. Care therefore needs to be taken to ensure that the development of large renewable energy projects, such as the proposed solar energy facility; do not affect the tourism potential of the Province.

The findings of the review of the relevant policies and documents pertaining to the energy sector therefore indicate that solar energy and the establishment of solar energy plants are supported at a national, provincial, and local level. It is therefore the opinion of the authors that the establishment of a solar energy plant on the proposed site is supported by national, provincial and local policies and planning documents.

4.4 SOCIAL IMPACTS ASSOCIATED WITH THE CONSTRUCTION PHASE

The key social issues associated with the construction phase include:

Potential positive impacts

- Creation of employment and business opportunities and opportunity for skills development and on-site training

Potential negative impacts

- Impacts associated with the presence of construction workers on site
- Influx of job seekers to the area;
- Loss of farm labour to the construction phase;
- Increased risk of stock theft, poaching and damage to farm infrastructure associated with presence of construction workers on the site
- Increased risk of veld fires associated with construction-related activities
- Threat to safety and security of farmers associated with the presence of construction workers on site
- Impact of heavy vehicles, including damage to roads, safety, noise and dust
- Potential loss of grazing land associated with construction-related activities.

4.4.1 Creation of employment and business opportunities

Based on information from other SEF projects the construction phase for a 75MW PVSEF is expected to extend over a period of 18-24 months and create approximately 291 employment opportunities, depending on the final design. Of this total ~ 60% (175) will be available to low-skilled workers (construction labourers, security staff etc.), 15% (43) to semi-skilled workers (drivers, equipment operators etc.) and 25% (73) to skilled personnel (engineers, land surveyors, project managers etc.). The work associated with the construction phase will be undertaken by contractors and will include the establishment of the PVSEF and the associated components, including, access roads, services and power line. The total wage bill for the construction phase is estimated to be in the region of R 60 million. This is based on the assumption that the average monthly salary for low skilled, semi-skilled and skilled workers will be in the region of R 5 000, R 8 000 and R 25 000 respectively for a period of 20 months. The injection of income into the area in the form of wages will represent a significant opportunity for the local economy and businesses in Hanover and De Aar.

Members from the local community are likely to be in a position to qualify for the majority of the low skilled and some of the semi-skilled employment opportunities. The majority of these employment opportunities are also likely to accrue to Historically Disadvantaged (HD) members from the local community. Given the high unemployment levels and limited job opportunities in Hannover, De Aar, Noupoot and the surrounding area this will represent a significant social benefit. The remainder of the semi-skilled and majority of the skilled employment opportunities are likely to be associated with the contractors appointed to construct the SEF and associated infrastructure.

The majority of low and semi-skilled employment opportunities are likely to be available to local residents in the area, specifically residents from Hanover or De Aar. The majority of the beneficiaries are likely to be historically disadvantaged (HD) members of the community. This would represent a significant positive social benefit in an area with limited employment opportunities. However, due to the potential mismatch of skills and low education levels, the potential employment opportunities for the members from these local communities may be low. This is an issue that will need to be addressed during the recruitment process. The proponent will therefore need to demonstrate a commitment to local employment targets in order to maximise the opportunities and benefits for members from the local community. Implementation of the enhancement measures listed below can enhance these opportunities. This issue also highlights the importance of implementing a training and skills development programme before the construction phase commences.

The capital expenditure on completion is anticipated to be in the region of R 1.35 billion for a 75 MW facility. In terms of business opportunities for local companies, expenditure

during the construction phase will create business opportunities for the regional and local economy. However, given the technical nature of the project and high import content associated with SEF's the opportunities for the local economy and towns of De Aar and Hanover are likely to be limited. However, opportunities are likely to exist for local contractors and engineering companies in Hanover and De Aar. The implementation of the enhancement measures listed below can enhance these opportunities.

The sector of the local economy that is most likely to benefit from the proposed development is the local service industry. The potential opportunities for the local service sector would be linked to accommodation, catering, cleaning, transport and security, etc. associated with the construction workers on the site. The majority of construction workers are likely to be accommodated in Hanover or Noupoot (20-30 km from site). This will create opportunities for local hotels, B&Bs, guest farms and people who want to rent out their houses. However, based on the information collected during the site visit long-term accommodation opportunities in Hanover are limited. There do appear opportunities to use vacant Transnet buildings in Noupoot to accommodate construction workers. However, this is an issue that the proponent will need to discuss with the ELM and Transnet.

The hospitality industry in the local towns is also likely to benefit from the provision of accommodation and meals for professionals (engineers, quantity surveyors, project managers, product representatives etc.) and other (non-construction) personnel involved on the project. Experience from other large construction projects indicates that the potential opportunities are not limited to on-site construction workers but also to consultants and product representatives associated with the project.

In terms of local support, Mr Stonga (ELM Mayor and relevant Ward Councilor) indicated that the ELM supported the development of renewable energy sector in the area and the proposed solar energy project and other renewable energy projects would support economic development. Feedback for other projects in the area indicated that Mr Jack (ELM Development Manager), Mr S. Madyo (ELM LED Manager) and Mr Bongani (NAFCOC Representative) all supported the development of renewable energy sector in the ELM and the proposed solar project was in line the ELMs plans to develop De Aar as a Renewable Energy Hub. This support would therefore also apply to the Klipgat SEF.

The implementation of the proposed enhancement measures listed below would also enable the establishment of the proposed SEF to support co-operation between the public and private sectors in order for the economic development potential of the Northern Cape to be realised. In this regard the Northern Cape PGDS highlights the importance of enterprise development, and notes that the current levels of private sector development and investment in the Northern Cape are low. The proposed SEF therefore has the potential to create opportunities to promote private sector investment and the development of SMMEs in the Northern Cape Province and ELM.

Table 4.1: Impact assessment of employment and business creation opportunities during the construction phase

Nature: Creation of employment and business opportunities during the construction phase		
	Without Mitigation	With Enhancement
Extent	Local – Regional (2)	Local – Regional (3)
Duration	Short Term (2)	Short Term (2)
Magnitude	Low (4)	Low (4)
Probability	Highly probable (4)	Highly probable (4)
Significance	Medium (32)	Medium (36)
Status	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	N/A	N/A
Can impact be enhanced?	Yes	
Enhancement : See below		
Cumulative impacts: Opportunity to up-grade and improve skills levels in the area.		
Residual impacts: Improved pool of skills and experience in the local area.		

Assessment of No-Go option

The potential employment and economic benefits associated with the construction of the proposed SEF would be forgone. The potential opportunity costs in terms of the capital expenditure, employment, skills development, and opportunities for local business are therefore regarded as a negative.

Recommended enhancement measures

In order to enhance local employment and business opportunities associated with the construction phase the following measures should be implemented:

Employment

- Where reasonable and practical the contractors appointed by the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories. However, due to the low skills levels in the area, the majority of skilled posts are likely to be filled by people from outside the area.
- Where feasible, efforts should be made to employ local contractors that are compliant with Black Economic Empowerment (BEE) criteria;
- Before the construction phase commences the proponent and its contractors should meet with representatives from the ELM to establish the existence of a skills database for the area. If such a database exists it should be made available to the contractors appointed for the construction phase.
- The local authorities, community representatives, and organisations on the interested and affected party database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the construction phase.
- Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the construction phase.
- The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.

Business

- The proponent should seek to develop a database of local companies, specifically BEE companies, which qualify as potential service providers (e.g. construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction contractors. These companies should be notified of the tender process and invited to bid for project-related work;
- The ELM, in conjunction with the local Chamber of Commerce and representatives from the local hospitality industry, should identify strategies aimed at maximising the potential benefits associated with the project.

Note that while preference to local employees and companies is recommended, it is recognised that a competitive tender process may not guarantee the employment of local labour for the construction phase.

4.4.2 Presence of construction workers in the area

The presence of construction workers poses a potential risk to family structures and social networks in the area, specifically local communities in Hanover and Noupoot. While the presence of construction workers does not in itself constitute a social impact, the manner in which construction workers conduct themselves can affect the local community. In this regard the most significant negative impact is associated with the disruption of existing family structures and social networks. This risk is linked to the potential behaviour of male construction workers, including:

- An increase in alcohol and drug use;
- An increase in crime levels;
- An increase in teenage and unwanted pregnancies;
- An increase in prostitution; and
- An increase in sexually transmitted diseases (STDs).

The findings of the SIA indicate that the local farmers in the area are opposed to construction workers being accommodated on the site. In this regard the proponent has indicated that no construction personnel, apart from security, will be accommodated on the site.

Based on information from other SEF projects the construction phase for a 75MW PVSEF is expected to extend over a period of 18-24 months and create approximately 291 employment opportunities, depending on the final design. Of this total ~ 60% (175) will be available to low-skilled workers (construction labourers, security staff etc.), 15% (43) to semi-skilled workers (drivers, equipment operators etc.) and 25% (73) to skilled personnel (engineers, land surveyors, project managers etc.).

It is reasonable to assume that the majority of the low skilled workers (175) and at least 60% of the semi-skilled workers (24) can be sourced locally. Employing members from the local community to fill the semi and low-skilled job categories will reduce the risk posed by construction workers to local communities. These workers will be from the local community and form part of the local family and social network. The proponent has indicated that they are committed to implementing a local employment policy, specifically for the low and semi-skilled employment opportunities associated with the construction phase. The total number of construction workers from outside the area that will need to be accommodated will therefore be in the region of 100, the majority of which (73) will be skilled workers. Based on this the overall impact of construction

workers on the local community with mitigation is likely to be low. However, due to the potential mismatch of skills and low education levels, the potential employment opportunities for the members from these local communities may be lower than anticipated. This is an issue that will need to be addressed during the recruitment process.

While the potential threat posed by construction workers to the community as a whole is likely to be low, the impact on individual members who are affected by the behavior of construction workers has the potential to be high, specifically if they are affected by STDs etc.

Table 4.2: Assessment of impact of construction workers on local communities

Nature: Potential impacts on family structures and social networks associated with the presence of construction workers		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (1)
Duration	Medium Term for community as a whole (3) Long term-permanent for individuals who may be affected by STD's etc. (5)	Medium Term for community as a whole (3) Long term-permanent for individuals who may be affected by STD's etc. (5)
Magnitude	Low for the community as a whole (4) High-Very High for specific individuals who may be affected by STD's etc. (10)	Low for community as a whole (4) High-Very High for specific individuals who may be affected by STD's etc. (10)
Probability	Probable (3)	Probable (3)
Significance	Low for the community as a whole (27) Moderate-High for specific individuals who may be affected by STD's etc. (57)	Low for the community as a whole (24) Moderate-High for specific individuals who may be affected by STD's etc. (51)
Status	Negative	Negative
Reversibility	No in case of HIV and AIDS	No in case of HIV and AIDS
Irreplaceable loss of resources?	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods	
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be eliminated	
Mitigation: See below		
Cumulative impacts: Impacts on family and community relations that may, in some cases, persist for a long period. Also in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community. The development of other solar energy projects in the area may exacerbate these impacts.		
Residual impacts: Community members affected by STDs etc. See cumulative impacts.		

Assessment of No-Go option

There is no impact as it maintains the current status quo. However, the potential positive impacts on the local economy associated with additional spending by construction workers in the local economy would be lost.

Recommended mitigation measures

The potential risks associated with construction workers can be mitigated. The aspects that should be covered include:

- Where possible, the proponent should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically semi and low-skilled job categories. This will reduce the potential impact that this category of worker could have on local family and social networks;
- The proponent should consider the establishment of a Monitoring Forum (MF) for the construction phase. The MF should be established before the construction phase commences and should include key stakeholders, including representatives from the local community, local councillors, farmers, and the contractor. The role of the MF would be to monitor the construction phase and the implementation of the recommended mitigation measures. The MF should also be briefed on the potential risks to the local community associated with construction workers;
- The proponent and the contractors should, in consultation with representatives from the MF, develop a Code of Conduct for the construction phase. The code should identify what types of behaviour and activities by construction workers are not permitted. Construction workers that breach the code of good conduct should be dismissed. All dismissals must comply with the South African labour legislation;
- The proponent and the contractor should implement an HIV/AIDS awareness programme for all construction workers at the outset of the construction phase;
- The movement of construction workers on and off the site should be closely managed and monitored by the contractors. In this regard the contractors should be responsible for making the necessary arrangements for transporting workers to and from site on a daily basis;
- The contractor should make necessary arrangements to enable workers from outside the area to return home over weekends and or on a regular basis during the 18 month construction phase. This would reduce the risk posed by non-local construction workers to local family structures and social networks;
- The contractor should make the necessary arrangements for ensuring that all non-local construction workers are transported back to their place of residence once the construction phase is completed. This would reduce the risk posed by non-local construction workers to local family structures and social networks;
- As per the agreement with the local farmers in the area, no construction workers, will be permitted to stay overnight on the site. Security personnel will be housed in the vicinity of the site.

4.4.3 Influx of job seekers to the area

Large construction projects tend to attract people to the area in the hope that they will secure a job, even if it is a temporary job. These job seekers can in turn become "economically stranded" in the area or decide to stay on irrespective of finding a job or not. While the proposed Klipgat SEF may, on its' own, not result in influx of significant numbers of job seekers to the area, the establishment of a number of renewable energy projects in the area, specifically in the vicinity of De Aar, has the potential to attract job seekers to the area. As in the case of construction workers employed on the project, the actual presence of job seekers in the area does not in itself constitute a social impact. However, the manner in which they conduct themselves can affect the local community.

There is also a concern that some of these job seekers may not leave town immediately and, in some cases, may stay indefinitely.

The potential social impacts associated with the influx of job seekers include:

- Impacts on existing social networks and community structures;
- Competition for housing, specifically low cost housing;
- Competition for scarce jobs;
- Increase in incidences of crime;
- An increase in sexually transmitted diseases (STDs).

These issues are similar to the concerns associated with the presence of construction workers and are discussed in Section 4.4.2. However, in some instances the potential impact on the community may be greater given that they are unlikely to have accommodation and may decide to stay on in the area. In addition, they will not have a reliable source of income. The risk of crime associated with the influx of job seekers it therefore likely to be greater.

Experience from other projects has also shown that the families of job seekers may also accompany individual job seekers or follow them later. In many cases the families of the job seekers that become “economically stranded” and the construction workers that decided to stay in the area, subsequently moved to the area. The influx of job seekers to the area and their families can also place pressure on the existing services in the area, specifically low income housing and schools. In addition to the pressure on local services the influx of construction workers and job seekers can also result in competition for scarce employment opportunities. Further secondary impacts include an increase in crime levels, especially property crime, because of the increased number of unemployed people. These impacts can result in increased tensions and conflicts between local residents and job seekers from outside the area.

The key lesson from other large construction projects is the importance of developing and implementing a well-structured recruitment strategy aimed at employing locals and minimising the number of job seekers moving into the area. The ELM should also anticipate that the support for renewable energy projects in the ELM has the potential to result in the influx of job seekers to the area. This influx and the demand that is may have on local services should be borne in mind when the IDP is reviewed and up-dated.

Table 4.3: Assessment of impact of job seekers on local communities

Nature: Potential impacts on family structures, social networks and community services associated with the influx of job seekers		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (2)
Duration	Permanent (5) (For job seekers that stay on the town)	Permanent (5) (For job seekers that stay on the town)
Magnitude	Minor for the community as a whole (2) High-Very High for specific individuals who may be affected by STD's etc. (10)	Minor for community as a whole (2) High-Very High for specific individuals who may be affected by STD's etc. (10)
Probability	Probable (3)	Probable (3)
Significance	Low for the community as a whole (27) Medium -High for specific individuals who may be affected by STD's etc. (54)	Low for the community as a whole (27) Medium-High for specific individuals who may be affected by STD's etc. (51)
Status	Negative	Negative
Reversibility	No in case of HIV and AIDS	No in case of HIV and AIDS
Irreplaceable loss of resources?	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods	
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be eliminated	
Mitigation: See below		
Cumulative impacts: Impacts on family and community relations that may, in some cases, persist for a long period. Also in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.		
Residual impacts: See cumulative impacts.		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

It is almost impossible to stop people from coming to the area in search of a job, specifically given that the PKSDM and ELM have identified renewable energy as a future growth sector. However, as indicated above, the proponent should ensure that the employment criteria favour local residents in the area. In addition the proponent should:

- In consultation with the ELM, investigate the option of establishing a MF (see above) to monitor and identify potential problems that may arise due to the influx of job seekers to the area. The MF should also include the other proponents of solar energy projects in the area;

- Implement a policy that no employment will be available at the gate. This should be linked to the establishment of employment offices in Hanover and other towns in the ELM.

4.4.4 Loss of farm labour to the construction phase

Experience from other projects indicates that the loss of farm workers is an issue of concern. In most instances local farmers are unlikely to be in a position to compete with the salaries offered by the renewable energy companies during the construction phase. As a result farm labourer's may be tempted to resign from their current positions on farms. The loss of skilled and experienced farm labor would have a negative impact on local farmers.

The potential impacts for the affected farmers associated with the loss of permanent farm labour to the construction phase are exacerbated by the security of tenure that permanent farm labourers enjoy in terms of the Extension of Security and Tenure Act (ESTA). Farm labourers who are eligible under ESTA and who take up jobs during the construction phase will be entitled stay on in their houses on the farms in question. The net effect is that the farmer may have to incur costs associated with the construction of new dwellings for new labour appointed to replace the labour lost to the construction phase. The farmer may also have to continue subsidizing services such as potable water to people who are no longer in his employ.

While the proposed Klipgat SEF on its own is unlikely to result in a significant loss of farm labour, the proposed establishment of a number of renewable energy projects in the area has the potential to impact on the farming sector. However, at the end of the day farm labor can be replaced. The potential impacts on farm operations are therefore likely to be temporary. In addition, the findings of the SIA indicate that the farming activities in the area are not labor intensive.

The farm workers that take up jobs during the construction phase are also at risk. While some farm workers may be re-employed once the construction has been completed, others may not be so fortunate. The low education levels associated with the farm worker community would effectively mean that alternative employment opportunities outside the agricultural sector will not be accessible to them. These farm workers and their families therefore stand to be negatively impacted upon in the medium to long term. The low education levels of local farm workers are however also likely to reduce the chances of them being employed during the construction phase.

On the positive side, some farm workers may view work associated with the construction phase as an opportunity to gain skills and relocate to the local towns in the area.

Table 4.4: Assessment of loss of farm labour to the construction phase

Nature: Potential impact on local farmers associated with loss of farm labour to the construction phase		
	Without Mitigation	With Mitigation
Extent	Local and Regional (2)	Local and Regional (1)
Duration	Medium Term (3) (Assumed that farm labour can be replaced)	Medium Term (3) (Assumed that farm labour can be replaced)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Low (27)	Low (24)
Status	Negative	Negative
Reversibility	Yes, if farm workers return of are replaced	Yes, if farm workers return of are replaced
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be eliminated	
Mitigation: See below		
Cumulative impacts: Impacts on farm operations due to loss of experienced farm labour		
Residual impacts: Increase in unemployment amongst local farm workers who are not rehired once construction worker comes to an end. On positive side, may result in increased skills for local farm workers and improve their economic mobility.		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

While the proponent can liaise with local farmers in the area and take steps not to employ local farm worker were possible, it is not possible to prevent farm workers from applying for work. There are therefore no recommended mitigation measures. Also it is assumed that farm labour can be replaced. The impacts would therefore be temporary.

Farm workers who apply for construction related work should also be informed that the nature of the work is temporary. In addition they should be informed of the potential negative consequences of their actions, which include the potential loss of their permanent farm job.

4.4.5 Increased risk of stock theft, poaching and damage to farm infrastructure

The presence of construction workers on the site increases the potential risk of stock theft and poaching. The movement of construction workers on and off the site also poses a potential threat to farm infrastructure, such as fences and gates, which may be damaged. Livestock and game losses may also result from gates being left open and/or fences being damaged. The local farm owners in the area who were interviewed indicated that stock theft was currently not a major concern. However, there are isolated cases involving the theft of sheep. However, concerns were raised regarding the

presence of construction workers in the area. In this regard the local farmers noted that no construction workers should be allowed to stay on the site overnight with the exception of security personnel.

Table 4.5: Assessment of impact of stock theft and damage to farm infrastructure

Nature: Potential loss of livestock, poaching and damage to farm infrastructure associated with the presence of construction workers on site		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (1)
Duration	Medium Term (3)	Medium Term (3)
Magnitude	Moderate (6) (Due to reliance on agriculture and livestock for maintaining livelihoods)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (33)	Low (24)
Status	Negative	Negative
Reversibility	Yes, compensation paid for stock losses etc.	Yes, compensation paid for stock losses etc.
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	Yes
Mitigation: See below		
Cumulative impacts: No, provided losses are compensated for		
Residual impacts: See cumulative impacts.		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

The mitigation measures that can be considered to address the potential impact on livestock, game, and farm infrastructure include:

- The proponent should enter into an agreement with the affected landowners whereby the company will compensate for damages to farm property and disruptions to farming activities. This includes losses associated with stock theft and damage to property etc. This agreement should be finalised before the commencement of the construction phase;
- The proponent should investigate the option of establishing a MF (see above) that includes local farmers and develop a Code of Conduct for construction workers. Should such a MF be required it should be established prior to commencement of the construction phase. The Code of Conduct should be signed by the proponent, the neighbouring landowners and the contractors before the contractors move onto site;
- The proponent should hold contractors liable for compensating farmers and communities in full for any stock losses and/or damage to farm infrastructure that can be linked to construction workers. This should be contained in tender documents for contractors and the Code of Conduct to be signed between the proponent, the

contractors and neighbouring landowners. The agreement should also cover losses and costs associated with fires caused by construction workers or construction related activities (see below);

- The EMP must outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested;
- Contractors appointed by the proponent should ensure that all workers are informed at the outset of the construction phase of the conditions contained on the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms.
- Contractors appointed by the proponent should ensure that construction workers who are found guilty of stealing livestock, poaching and/or damaging farm infrastructure should be charged as per the conditions contained in the Code of Conduct. All dismissals must be in accordance with South African labour legislation;
- The housing of construction workers on the site should be limited to security personnel.

4.4.6 Increased risk of veld fires

The presence of construction workers and construction-related activities on the site poses an increased risk of veld fires that in turn pose a threat to the livestock, wildlife, and farmsteads in the area. In the process, farm infrastructure may also be damaged or destroyed and human lives threatened. The findings of the SIA indicate that the loss of grazing due to veld fires would impact on the livelihoods of local farmers in the area.

- The potential risk of veld fires is heightened by windy conditions in the area, specifically during the dry, windy winter months.
- The dominant agricultural activity in the broader area is livestock farming, specifically sheep. As such, the livelihoods of the farmers in the area are dependent on grazing on their farms. Any loss of grazing due to a fire would therefore impact negatively on the affected farmers livelihoods;
- The risk of fire related damage is exacerbated by the limited access to fire-fighting vehicles.

Table 4.6: Assessment of impact of increased risk of veld fires

Nature: Potential loss of livestock, crops and houses, damage to farm infrastructure and threat to human life associated with increased incidence of veld fires		
	Without Mitigation	With Mitigation
Extent	Local (4) (Rated as 4 due to potential severity of impact on local farmers)	Local (2) (Rated as 2 due to potential severity of impact on local farmers)
Duration	Short Term (2)	Short Term (2)
Magnitude	Moderate due to reliance on livestock for maintaining livelihoods (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (36)	Low (24)
Status	Negative	Negative
Reversibility	Yes, compensation paid for stock and losses and damage etc.	
Irreplaceable loss	No	No

of resources?		
Can impact be mitigated?	Yes	
Mitigation: See below		
Cumulative impacts: No, provided losses are compensated for.		
Residual impacts: Potential loss of income and impact on livelihoods and economic viability of affected farms.		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

As indicated above, the proponent should enter into an agreement with the affected landowners whereby the company will compensate for damages. This includes losses associated veld fires. In addition, the potential increased risk of veld fires can be effectively mitigated. Mitigation measures include:

- Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas;
- No smoking on the site, except in designated areas should be permitted;
- Contractor should ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include clearing working areas and avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high risk dry, windy winter months;
- Contractor should provide adequate fire fighting equipment on-site;
- Contractor should provide fire-fighting training to selected construction staff;
- As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the fire fighting costs borne by farmers and local authorities.

In addition the landowners and developers should also ensure that they join the local fire protection agency.

4.4.7 Impacts associated with movement of construction vehicles

The main access to the site will be via the Dwaal Road and also via the railway line. The Dwaal Road links up with the N9 and N1 and also provides primary access to a number of farms (Caroluspoort, Toitdale, Visgat) located between the N1 and Noupoort along the Dwaal sideline. The findings of the SIA indicate that the volume of traffic along the Dwaal Road is low. The social impacts associated with the movement of construction related traffic along this road are therefore likely to be low.

However, the movement of large, heavy loads during the construction phase has the potential to impact on the quality of the road surface, which in turn would impact on the local farmers in the area who use the road. In addition, the heavy vehicles can also create delays and safety impacts for other road users travelling along the N9 and N10. These impacts can however be mitigated by timing the trips to avoid times of the year when traffic volumes are likely to be higher, such as start and end of school holidays, long weekends and weekends in general etc.

The option of railing material from Port Elizabeth to should be investigated. This would reduce the potential impact on other road users along the N10. Based comments from other renewable energy projects near De Aar, Mr. Bangani (NAFCOC representative) and Mr Jack (ELM IDP and LED Manager) both indicated that that the option of using rail to transport equipment to the PKSDM should be investigated. Mr Bangani also indicated that the establishment proposed of a Renewable Energy Hub centred at De Aar would also create an opportunity to revitalise the railway sector in De Aar.

Table 4.7: Assessment of the impacts associated with construction vehicles

Nature: Potential noise, dust and safety impacts associated with movement of construction related traffic to and from the site		
	Without Mitigation	With Mitigation
Extent	Local-Regional (2)	Local-Regional (1)
Duration	Medium Term (3)	Medium Term (3)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Low (27)	Low (24)
Status	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation: See below		
Cumulative impacts: If damage to roads is not repaired then this will affect the farming activities in the area and result in higher maintenance costs for vehicles of local farmers and other road users. The costs will be borne by road users who were no responsible for the damage.		
Residual impacts: Reduced quality of road surfaces and impact on road users		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

As indicated above, the proponent should enter into an agreement with the affected landowners whereby the company will compensate for damages. This includes damage to local roads by construction vehicles. In addition, the potential impacts associated with heavy vehicles and dust can be effectively mitigated. The aspects that should be covered include:

- Abnormal loads should be timed to avoid times of the year when traffic volumes are likely to be higher, such as start and end of school holidays, long weekends and weekends in general etc.;
- The contractor must ensure that all damage caused to local farm roads by the construction related activities, including heavy vehicles, is repaired before the completion of the construction phase. The costs associated with the repair must be borne by the contractor;

- Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers;
- All vehicles must be road-worthy and drivers must be qualified, made aware of the potential road safety issues, and need for strict speed limits.

In addition, it is recommended that the proponent investigate the option of using rail to transport materials and equipment from Port Elizabeth to the site via De Aar.

4.4.8 Damage to and loss of farmland

The activities associated with the construction phase have the potential to result in the loss of land available for grazing. However, only one landowner is affected and it is assumed that he has entered into a lease agreement with the proponent. The loss of productive farmland would therefore be offset by the income from the lease agreement.

The final disturbance footprint can also be reduced by careful site design and placement of components. The impact on farmland associated with the construction phase can therefore be mitigated by minimising the footprint of the construction related activities and ensuring that disturbed areas are fully rehabilitated on completion of the construction phase. Recommended mitigation measures are outlined below.

Table 4.8: Assessment of impact on farming and farmland due to construction related activities

Nature: The activities associated with the construction phase, such as establishment of access roads and the construction camp, movement of heavy vehicles and preparation of foundations for the PV facility and power lines will damage farmlands and result in a loss of farmlands for future farming activities.		
	Without Mitigation	With Mitigation
Extent	Local (3)	Local (1)
Duration	Long term-permanent if disturbed areas are not effectively rehabilitated or compensation is not paid (5)	Medium Term if damaged areas are rehabilitated (3)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (36)	Low (28)
Status	Negative	Negative
Reversibility	Yes, disturbed areas can be rehabilitated	Yes, disturbed areas can be rehabilitated
Irreplaceable loss of resources?	Yes, loss of farmland. However, disturbed areas can be rehabilitated	Yes, loss of farmland. However, disturbed areas can be rehabilitated
Can impact be mitigated?	Yes, however, loss of farmland cannot be avoided	Yes, however, loss of farmland cannot be avoided
Mitigation: See below		
Cumulative impacts: Overall loss of farmland could affect the livelihoods of the affected farmer, and the workers on the farm and their families. However, disturbed areas can be rehabilitated.		

Residual impacts: See cumulative impacts.

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

The potential impacts associated with damage to and loss of farmland can be effectively mitigated. The aspects that should be covered include:

- The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be minimised;
- An Environmental Control Officer (ECO) should be appointed to monitor the construction phase;
- All areas disturbed by construction related activities, such as access roads on the site, construction platforms, workshop area etc., should be rehabilitated at the end of the construction phase;
- The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. The specifications for the rehabilitation programme should be drawn up a suitably qualified ecologist;
- The implementation of the Rehabilitation Programme should be monitored by the ECO.

4.5 SOCIAL IMPACTS ASSOCIATED WITH OPERATIONAL PHASE

The key social issues affecting the operational phase include:

Potential positive impacts

- Creation of employment and business opportunities. The operational phase will also create opportunities for skills development and training;
- Benefits associated with the establishment of a Community Trust;
- The establishment of renewable energy infrastructure.

Potential negative impacts

- Influx of job seekers to the area;
- The visual impacts and associated impact on sense of place;
- Potential impact on tourism.

4.5.1 Creation of employment and business opportunities

Based on the information provided by the proponent, the proposed PVSEF will create ~ 60 permanent employment opportunities during the 20 year operational phase. Of this total ~ 30 (50%) will be low skilled (security and maintenance), 10 (17%) semi-skilled and 20 (33%) skilled employees. Members from the local community are likely to be in a position to qualify for the majority of the low skilled and some of the semi-skilled employment opportunities. The majority of these employment opportunities are also likely to accrue to Historically Disadvantaged (HD) members from the local community. Given the high unemployment levels and limited job opportunities in the area this will represent a social benefit. The remainder of the semi-skilled and majority of the skilled employment opportunities are likely to be associated with people from outside the area.

The proponent has also indicated that they are committed to implementing a training and skills development programme during the operational phase. Such a programme

would support the strategic goals of promoting local employment and skills development contained in the ELM IDP.

Given the location of the proposed facility the majority of permanent staff is likely to reside in Hanover or Noupoot. In terms of accommodation options, a percentage of the non-local permanent employees may purchase houses in one of these towns, while others may decide to rent. Both options would represent a positive economic benefit for the region. In addition, a percentage of the monthly wage bill earned by permanent staff would be spent in the regional and local economy, which will benefit local businesses in these towns. The benefits to the local economy will extend over the operational lifespan of the project.

The local hospitality industry in Hanover, Middelburg and Noupoot is also likely to benefit from the operational phase. These benefits are associated with site visits by company staff members and other professionals (engineers, technicians etc.) who are involved in the company and the project but who are not linked to the day-to-day operations.

Mr Madyo (ELM IDP and LED Manager) indicated that proposed establishment of renewable energy facilities in the area was strongly supported by the ELM. In this regard the municipality had identified the establishment of a renewable energy as one of the key economic opportunities for the area. The proposed establishment of a renewable energy hub would create employment and skills development opportunities, which in turn would assist to address unemployment and create opportunities for local businesses. Due the large number of renewable energy facilities proposed in the ELM it is recommended that the ELM investigate the option of establishing a forum to assist the renewable energy sector with the establishment of Community Trusts. This would enable the ELM to ensure that the various Community Trusts established as per the requirements set out by the Department of Energy are aligned with and support the developmental objectives set out in the ELM's Integrated Development Plan (IDP) and Local Economic Development (LED) strategy.

Table 4.9: Impact assessment of employment and business creation opportunities

Nature: Creation of employment and business opportunities associated with the operational phase		
	Without Mitigation	With Enhancement
Extent	Local and Regional (1)	Local and Regional (2)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Highly Probable (4)
Significance	Medium (33)	Medium (48)
Status	Positive	Positive
Reversibility	N/A	
Irreplaceable loss of resources?	No	
Can impact be enhanced?	Yes	

Enhancement: See below
Cumulative impacts: Creation of permanent employment and skills and development opportunities for members from the local community and creation of additional business and economic opportunities in the area
Residual impacts: See cumulative impacts

Assessment of No-Go option

The potential opportunity costs in terms of the loss of employment and skills and development training would be lost which would represent a negative impact.

Recommended enhancement measures

The enhancement measures listed in Section 4.4.1, i.e. to enhance local employment and business opportunities during the construction phase, also apply to the operational phase. In addition:

- The proponent should implement a training and skills development programme for locals during the first 5 years of the operational phase. The aim of the programme should be to maximise the number of locals employed during the operational phase of the project.
- The proponent, in consultation with the ELM, should investigate the opportunities for establishing a Community Trust (see comments below).

4.5.2 Benefits associated with the establishment of a community trust

In terms of the Request for Proposal document prepared by the Department of Energy all bidders for operating licences for renewable energy projects must demonstrate how the proposed development will benefit the local community. This can be achieved by establishing a community trust which is funded by revenue generated from the sale for energy. The proponent has indicated that they are committed to establishment of a community trust.

Community trusts provide an opportunity to generate a reliable and steady revenue stream over a 20 year period. This revenue can be used to fund development initiatives in the area and support the local economic and community development. The 20 year timeframe also allows local municipalities and communities to undertake long term planning for the area. The revenue from the proposed SEF can be used to support a number of social and economic initiatives in the area, including:

- Education (adult and child);
- Health care;
- Training and skills development;
- Support for SMME's.

Revenue from renewable energy projects could also be used to address the infrastructure backlogs in the ELM. As indicated above, the ELM should investigate the option of establishing a forum to assist the renewable energy sector with the establishment of Community Trusts. Experience has however also shown that Community Trusts can be mismanaged. This issue will need to be addressed in order to maximise the potential benefits associated with the establishment of a Community Trust.

Due the number of other renewable energy facilities proposed in the ELM it is recommended that the ELM investigate the option of establishing a forum to assist the renewable energy sector with the establishment of Community Trusts. This would enable

the ELM to ensure that the various Community Trusts established as per the requirements set out by the Department of Energy are aligned with and support the developmental objectives set out in the ELM's Integrated Development Plan (IDP) and Local Economic Development (LED) strategy.

Table 4.10: Assessment of benefits associated with establishment of a community trust

Nature: Establishment of a Community Trust funded by revenue generated from the sale of energy. The revenue can be used to fund local community development		
	Without Mitigation	With Enhancement
Extent	Local and Regional (2)	Local and Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Definite (5)
Significance	Medium (36)	High (65)
Status	Positive	Positive
Reversibility	N/A	
Irreplaceable loss of resources?	No	
Can impact be enhanced?	Yes	
Enhancement: See below		
Cumulative impacts: Promotion of social and economic development and improvement in the overall well-being of the community		
Residual impacts: See cumulative impacts		

Assessment of No-Go option

There is no impact as it maintains the current status quo. However, the potential opportunity costs in terms of the supporting the social and economic development in the area would be lost. This would also represent a negative impact.

Recommended enhancement measures

In order to maximise the benefits and minimise the potential for corruption and misappropriation of funds the following measures should be implemented:

- The proponent in consultation with the ELM should establish criteria for identifying and funding community projects and initiatives in the area. The criteria should be aimed at maximising the benefits for the community as a whole and not individuals within the community;
- ELM should investigate the option of establishing a forum to assist the renewable energy sector with the establishment of Community Trusts;
- The proponent in consultation with the ELM should ensure that strict financial management controls, including annual audits, should be implemented to ensure that the funds generated for the community trust from the SEF are managed for benefit of the community as a whole and not individuals within the community.

4.5.3 Development of clean, renewable energy infrastructure

South Africa currently relies on coal-powered energy to meet more than 90% of its energy needs. As a result South Africa is one of the highest per capita producers of carbon emissions in the world and Eskom, as an energy utility, has been identified as the world's second largest producer carbon emissions. The establishment of a clean, renewable energy facility will therefore reduce, albeit minimally, South Africa's reliance on coal-generated energy and the generation of carbon emissions into the atmosphere.

The overall contribution to South Africa's total energy requirements of the proposed SEF is relatively moderate. However, the 75 MW produced will help to offset the total carbon emissions associated with energy generation in South Africa. Given South Africa's reliance on Eskom as a power utility, the benefits associated with an IPP based on renewable energy are regarded as an important contribution.

Table 4.11: Development of clean, renewable energy infrastructure

Nature: Promotion of clean, renewable energy		
	Without Mitigation	With Mitigation (The provision of renewable energy infrastructure is in itself a mitigation measure)
Extent	Local, Regional and National (4)	Local, Regional and National (4)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Low (4)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	Medium (48)	Medium (48)
Status	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	Yes, impact of climate change on ecosystems	
Can impact be mitigated?	Yes	
Enhancement: See below		
Cumulative impacts: Reduce carbon emissions via the use of renewable energy and associated benefits in terms of global warming and climate change.		
Residual impacts: See cumulative impacts		

Assessment of No-Go option

The No-Development option would represent a lost opportunity for South Africa to supplement its current energy needs with clean, renewable energy. This would represent a negative opportunity cost.

Recommended mitigation measures

The establishment of the proposed facility represents an enhancement measure in itself. In order to maximise the benefits of the proposed project the proponent should:

- Use the project to promote and increase the contribution of renewable energy to the national energy supply;
- Implement a training and skills development programme for locals during the first 5 years of the operational phase. The aim of the programme should be to maximise the number of South African's employed during the operational phase of the project.

4.5.4 Influx of job seekers to the area

While the proposed SEF on its own is unlikely to result in a significant influx of job seekers during the operational phase, the proposed establishment of a number of renewable energy projects in and around De Aar the surrounding area is likely to attract job seekers to the area. These issues are similar to the concerns associated with the influx of jobs seekers during the construction phase and include:

- Impacts on existing social networks and community structures;
- Competition for housing, specifically low cost housing;
- Pressure on local services, such as schools, clinics etc.;
- Competition for scarce jobs;
- Increase in incidences of crime;
- Increase in transmission of STD's etc.

Table 4.12 Assessment of impact of job seekers on local communities

Nature: Potential impacts on family structures, social networks and community services associated with the influx of job seekers		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (2)
Duration	Permanent (5) (For job seekers that stay on the town)	Permanent (5) (For job seekers that stay on the town)
Magnitude	Low for the community as a whole (4) High-Very High for specific individuals who may be affected by STD's etc. (10)	Minor for community as a whole (2) High-Very High for specific individuals who may be affected by STD's etc. (10)
Probability	Probable (3)	Probable (3)
Significance	Medium for the community as a whole (33) Medium -High for specific individuals who may be affected by STD's etc. (51)	Low for the community as a whole (27) Medium-High for specific individuals who may be affected by STD's etc. (51)
Status	Negative	Negative
Reversibility	No in case of HIV and AIDS	No in case of HIV and AIDS
Irreplaceable loss of resources?	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods	
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be eliminated	
Mitigation: See below		

Cumulative impacts: Impacts on family and community relations that may, in some cases, persist for a long period. Also in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.

Residual impacts: See cumulative impacts.

Recommended mitigation measures

It is impossible to stop people from coming to the area in search of work, specifically given that the PKSDM and ELM have identified renewable energy as key growth sector. However, as indicated above, the proponent should ensure that the employment criteria favour local residents in the area. In addition the proponent should:

- In consultation with the ELM, should investigate the option of establishing a MF (see above) to monitor and identify potential problems that may arise due to the influx of job seekers to the area. The MF should also include the proponents of other renewable energy projects in the area;
- Implement a policy that no employment will be available at the gate. This should be linked to the establishment of employment offices in Hanover and other local towns in the ELM.

4.5.5 Loss of farm labour

Experience from other projects indicates that the loss of farm workers is an issue of concern. In most instances local farmers are unlikely to be in a position to compete with the salaries offered by the renewable energy companies. As a result farm labourers may be tempted to resign from their current positions on farms. The loss of skilled and experienced farm labor would have a negative impact on local farmers. The potential impacts for the affected farmers associated with the loss of permanent farm labour are exacerbated by the security of tenure that permanent farm labourers enjoy in terms of the Extension of Security and Tenure Act (ESTA). Those farm labourers which are eligible under ESTA and who take up jobs during the construction phase are entitled stay on in their houses on the farms in question. The net effect is that the farmer may have to incur the costs associated with the construction of new dwellings for new labour appointed to replace the labour lost to the renewable energy sector.

While the proposed SEF on its own is unlikely to result in a significant loss of farm labour, the proposed establishment of a number of renewable energy projects in the area has the potential to impact on the farming sector. However, at the end of the day farm labor can be replaced. The potential impacts on farm operations are therefore likely to be temporary.

However, at the same time the employment opportunities associated with the renewable energy sector may offer local farm workers with an opportunity to get better paid jobs which would benefit them and their families. These jobs may also enable them to move of the farms and into Hanover and other local towns, which would improve their access to services such as schools and clinics etc. This would represent a positive social benefit for the farm workers in question.

Table 4.13: Assessment of loss of farm labour during the operational phase

Nature: Potential impact on local farmers associated with loss of farm labour to the operational phase		
	Without Mitigation	With Mitigation
Extent	Local and Regional (3)	Local and Regional (2)
Duration	Short term (2) (Assumed that farm labour can be replaced)	Short term (2) (Assumed that farm labour can be replaced)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Low (27)	Low (24)
Status	Negative	Negative
Reversibility	Yes, if farm workers return or are replaced	Yes, if farm workers return or are replaced
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be eliminated	
Mitigation: See below		
Cumulative impacts: Impacts on farm operations due to loss of experienced farm labour		
Residual impacts: See cumulative impacts.		

Recommended mitigation measures

While the proponent could liaise with local farmers in the area and undertake not to employ farm worker were possible, it is not possible to prevent farm workers from applying for work in other sectors. There are therefore no recommended mitigation measures. Also it is assumed that farm labour can be replaced. The impacts would therefore be temporary.

4.5.6 Visual impact and impact on sense of place

The components associated with the proposed SEF will have a visual impact and, in so doing, impact on the landscape and rural sense of the place of the area. However, unlike wind energy facilities, the impact associated with SEFs is lower due to the significantly lower height of the solar panels and infrastructure.

Based on the findings of the SIA the potential impact of the proposed SEF on the areas sense of place is likely to be limited. The areas sense of place has also been impacted by the Dwaal rail line and the existing 132 kV line (Linde-Carolus) that traverses the site. In addition the site is located within the proposed SEF development corridor De Aar – Noupoort identified by the PKSDM.

Table 4.14: Visual impact and impact on sense of place

Nature: Visual impact associated with the proposed solar facility and the potential impact on the areas rural sense of place.		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (1)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (36)	Low (27)
Status	Negative	Negative
Reversibility	Yes, solar facility can be removed.	
Irreplaceable loss of resources?	No	
Can impact be mitigated?	Yes	
Enhancement: See below		
Cumulative impacts: Potential impact on current rural sense of place		
Residual impacts: See cumulative impacts		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

The recommendations contained in the VIA should be implemented.

4.5.7 Impact on tourism

The Northern Cape PGDS notes that the sustainable utilisation of the natural resource base on which agriculture depends is critical in the Northern Cape with its fragile ecosystems and vulnerability to climatic variation. The document also indicates that due to the provinces exceptional natural and cultural attributes, it has the potential to become the preferred adventure and ecotourism destination in South Africa. Therefore caution must be taken to ensure that the development of renewable energy projects, such as the proposed SEF, do not impact negatively on the tourism potential of the Province.

In terms of the site, the findings of the SIA indicate that there are limited tourism facilities in the area. The closest appears to be New Holme, which is located ~20 km, to the west of the site. The Klipgat area not identified as tourism growth area, the focus is further to the north – along the Orange River. The potential impact on tourism in the area is therefore likely to be low.

The findings of the SIA also indicate that the establishment of the proposed SEF may also attract tourists to the area. However, the significance of this potential benefit is also rated as Low positive.

Table 4.15: Impact on tourism

Nature: Potential impact of the SEF on local tourism		
	Without Mitigation	With Enhancement / Mitigation
Extent	Local (2)	Local (3)
Duration	Long term (4)	Long term (4)
Magnitude	Low (2)	Low (2)
Probability	Probable (3)	Probable (3)
Significance	Low (24) (Applies to both – and +)	Low (27) (Applies to both – and +)
Status	Negative (Potential to distract from the tourist experience of the area) Positive (Potential to attract people to the area)	Negative (Potential to distract from the tourist experience of the area) Positive (Potential to attract people to the area)
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impact be enhanced?	Yes	
Enhancement: See below		
Cumulative impacts: Potential negative and or positive impact on tourism in the ELM.		
Residual impacts: See cumulative impacts		

Assessment of No-Go option

The No-Development option would represent a lost opportunity to create a facility that has the potential to attract visitors to the area. This would represent a negative opportunity cost.

Recommended mitigation measures

The recommendations contained in the VIA should be implemented.

In terms of efforts to enhance the proposed benefits to tourism:

- The proponent should liaise with representatives from the ELM and local tourism representatives to raise awareness of the proposed facility;
- The proponent should investigate the option of establishing a renewable energy interpretation centre at entrance to the site. The centre should include a viewing area where passing visitors can stop and view the site.

4.6 ASSESSMENT POWER LINE OPTIONS

The power line option involves a short (<500m) overhead link line to an existing Eskom line on Klipgat. The findings of the SIA therefore indicate that the social impacts associated with the power line will be low. This is due to the limited number of homesteads that will be visually affected and the presence of the existing power line that traverses the site.

Table 4.16: Assessment of transmission line options

Nature: Potential visual impact and impact on sense of place associated with power lines		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (1)
Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Low (24)	Low (21)
Status	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impact be mitigated?	Yes	
Enhancement: See below		
Cumulative impacts: Limited visual and impact on sense of place		
Residual impacts: See cumulative impacts		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

The recommendations contained in the VIA should be implemented. The measures listed above to address the potential impacts associated with the construction phase also apply to the construction of the power line.

4.7 ASSESSMENT OF NO-DEVELOPMENT OPTION

The No-Development option would represent a lost opportunity for South Africa to supplement its current energy needs with clean, renewable energy. Given South Africa’s position as one of the highest per capita producers of carbon emissions in the world, this would represent a negative social cost. In addition, the employment opportunities associated with the construction and operational phase, as well as the benefits associated with the establishment of a Community Trust would be forgone.

Table 4.17: Assessment of no-development option

Nature: The no-development option would result in the lost opportunity for South Africa to supplement its current energy needs with clean, renewable energy		
	Without Mitigation	With Mitigation
Extent	Local-International (4)	Local-International (4)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	Medium (54)	Medium (54)
Status	Negative	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	Yes, impact of climate change on ecosystems	
Can impact be mitigated?	Yes	
Enhancement: See below		
Cumulative impacts: Reduce carbon emissions via the use of renewable energy and associated benefits in terms of global warming and climate change.		
Residual impacts: See cumulative impacts		

Recommended enhancement measures

The development of the proposed SEF would represent an enhancement measure. However, the impact of large facilities on the sense of place and landscape are issues need to be addressed in the location, design and layout of the proposed plant.

4.8 CUMULATIVE IMPACT ON SENSE OF PLACE

Although there appear to be no guidelines for solar facilities, the Australian Wind Farm Development Guidelines (Draft, July 2010) indicate that the cumulative impact of multiple wind farm facilities is likely to become an increasingly important issue for wind farm developments in Australia. This finding is also likely to apply to solar energy plants and is also likely to be the case in South Africa. The key concerns in terms of cumulative impacts are, as in the case of wind farms, also likely to be linked to visual impacts and the impact on rural, undeveloped landscapes.

The Scottish Natural Heritage (2005) describes a range of potential cumulative landscape impacts associated with wind farms on landscapes. These issues raised in these guidelines as to what defines a cumulative impact are also regarded as pertinent to solar facilities, specifically given that the key issue of concern is likely to relate to the impact on rural, undeveloped landscapes. The relevant issues raised in the by Scottish Natural Heritage include:

- Combined visibility (whether two or more wind farms (solar facilities) will be visible from one location).
- Sequential visibility (e.g. the effect of seeing two or more wind farms (solar facilities) along a single journey, e.g. road or walking trail).

- The visual compatibility of different wind farms (solar facilities) in the same vicinity.
- Perceived or actual change in land use across a character type or region.
- Loss of a characteristic element (e.g. viewing type or feature) across a character type caused by developments across that character type.

The guidelines also note that cumulative impacts need to be considered in relation to dynamic as well as static viewpoints. The experience of driving along a tourist road, for example, needs to be considered as a dynamic sequence of views and visual impacts, not just as the cumulative impact of several developments on one location. The viewer may only see one wind farm (solar facility) at a time, but if each successive stretch of the road is dominated by views of a wind farm (solar facility), then that can be argued to be a cumulative visual impact (National Wind Farm Development Guidelines, DRAFT - July 2010). It is reasonable to assume that these issues will also apply to solar thermal plants.

Research on wind farms undertaken by Warren and Birnie (2009) also highlights the visual and cumulative impacts on landscape character. The paper notes that given that aesthetic perceptions are a key determinant of people's attitudes, and that these perceptions are subjective, deeply felt and diametrically contrasting, it is not hard to understand why the arguments become so heated. Because landscapes are often an important part of people's sense of place, identity and heritage, perceived threats to familiar vistas have been fiercely resisted for centuries. The paper also identifies two factors that important in shaping people's perceptions of wind farms' landscape impacts. The first of these is the cumulative impact of increasing numbers of wind farms (Campbell, 2008). The research found that if people regard a region as having 'enough' wind farms already, then they may oppose new proposals. The second factor is the cultural context. This relates to people's perception and relationship with the landscape. In the South African context, the majority of South Africans have a strong connection with and affinity for the large, undisturbed open spaces that are characteristic of the South African landscape. The concerns raised with regard to wind farms and the impact on landscapes are also likely to apply to solar facilities.

The impact of solar facilities on the landscape is therefore likely to be a key issue in South Africa, specifically given South African's strong attachment to the land and the growing number of solar plant applications. However, the relevant environmental authorities should be aware of the potential cumulative impacts associated with the establishment of renewable energy facilities in the area when evaluating applications.

In the case of the proposed Klipgat SEF, there are ~ 10 SEFs proposed in the PKSDM, the majority of which are located around De Aar, Prieska and Hanover west of the N1. Klipgat is the only SEF one in ELM east of the N1. Two SEFs and one WEF are proposed south of Noupport (i.e. 20-30 km away). However, the volume of traffic on the Dwaal Road is extremely low. The potential cumulative impacts associated with sequential visibility (e.g. the effect of seeing two or more wind farms (solar facilities) along a single journey, e.g. road or walking trail) is therefore likely to be low.

Table 4.18: Cumulative impacts on sense of place and the landscape

Nature: Visual impacts associated with the establishment of more than one solar plant and the potential impact on the areas rural sense of place and character of the landscape.		
	Without Mitigation	With Mitigation
Extent	Local and regional (2)	Local and regional (2)
Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Low (24)	Low (24)
Status	Negative	Negative
Reversibility	Yes. Solar energy plant components and other infrastructure can be removed.	
Irreplaceable loss of resources?	No	
Can impact be mitigated?	Yes	
Enhancement: See below		
Cumulative impacts: Impact on other activities whose existence is linked to linked to rural sense of place and character of the area, such as tourism, bird watching, and hunting.		
Residual impacts: See cumulative impacts		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

The establishment of a number of large renewable energy facilities in the area does have the potential to have a negative cumulative impact on the areas sense of place and the landscape. The environmental authorities should consider the overall cumulative impact on the rural character and the areas sense of place before a final decision is taken with regard to the optimal number of such plants in an area. In addition, the recommendations contained in the VIA should be implemented.

4.9 CUMULATIVE IMPACT ON LOCAL ECONOMY

In addition to the potential negative impacts, the establishment of the other renewable energy projects in the area also has the potential to result in significant positive cumulative socio-economic impacts for the ELM. The positive cumulative impacts include creation of employment, skills development and training opportunities (construction and operational phase), creation of downstream business opportunities and stimulation of the local property market.

The potential cumulative benefit for the local economy was identified as a key issue by the PKSDM LED Manager, Mr. Madyo). As indicated above, PKSDM LED strategy is to create a national energy hub in De Aar, specifically in order to benefit from potential long term components manufacture and servicing associated with the sector.

Table 4.19: Cumulative impacts on local economy

Nature: The establishment of a number of renewable energy facilities in and around the area will create employment, skills development and training opportunities, creation of downstream business opportunities and stimulation of the local property market.		
	Without Enhancement	With Enhancement
Extent	Local and regional (3)	Local and regional (4)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Moderate (6)
Probability	Highly Probable (4)	Definite (5)
Significance	Medium (44)	High (70)
Status	Positive	Positive
Reversibility	Yes. Solar energy plant components and other infrastructure can be removed.	
Irreplaceable loss of resources?	No	
Can impact be enhanced?	Yes	
Enhancement: See below		
Cumulative impacts: Positive impact on the local and regional economy through the creation of downstream opportunities and wage spend in the local economy		
Residual impacts: See cumulative impacts		

Assessment of No-Go option

There is no impact as it maintains the current status quo. However, the no-go option would represent a lost socio-economic opportunity for the ELM.

Recommended mitigation measures

The establishment of a number of large renewable energy facilities in the area does have the potential to have a negative cumulative impact on the areas sense of place and the landscape. However, as indicated above, the ELM does support the establishment of renewable energy facilities in the area. The environmental authorities therefore need to take into account the potential positive and negative cumulative impacts before a final decision is taken with regard to the number and location of renewable energy facilities in an area.

4.10 ASSESSMENT OF DECOMMISSIONING PHASE

Typically, the major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, the communities within which they live, and the relevant local authorities. However, in the case of the proposed facility the decommissioning phase is likely to involve the disassembly and replacement of the existing components with more modern technology. This is likely to take place in the 20 years post commissioning. The decommissioning phase is therefore likely to create additional, construction type jobs, as opposed to the jobs losses typically associated with decommissioning.

In addition, the social impacts associated with final decommissioned are likely to be limited due to the relatively small number of permanent employees (60) affected. The potential impacts associated with the decommissioning phase can also be effectively managed with the implementation of a retrenchment and downscaling programme. With mitigation, the impacts are assessed to be Low (negative).

The decommissioning phase will also involve the disassembly of the SEF rehabilitation of the site. The decommissioning phase will therefore also create additional, construction type jobs. Based on other SEF projects ~ 50 people will be employed during the decommissioning phase.

Table 4.20: Social impacts associated with decommissioning

Nature: Social impacts associated with retrenchment including loss of jobs, and source of income		
	Without Mitigation	With Mitigation
Extent	Local and regional (3)	Local and regional (2)
Duration	Medium Term (2)	Very Short Term (1)
Magnitude	Moderate (6)	Low (4)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	Medium (44)	Low (16)
Status	Negative	Negative-Neutral
Reversibility	Yes, assumes retrenchment packages are paid to all affected employees	
Irreplaceable loss of resources?	No	
Can impact be mitigated?	Yes	
Mitigation: See below		
Cumulative impacts: Loss of jobs and associated loss of income etc. can impact on the local economy and other businesses. However, decommissioning can also create short term, temporary employment opportunities associated with dismantling etc.		
Residual impacts: See cumulative impacts		

Recommended mitigation measures

The following mitigation measures are recommended:

- The proponent should ensure that retrenchment packages are provided for all staff who stand to lose their jobs when the plant is decommissioned;
- All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning;
- The proponent should investigate the option of establishing an Environmental Rehabilitation Trust Fund to cover the costs of decommissioning and rehabilitation of disturbed areas. The Trust Fund should be funded by a percentage of the revenue generated from the sale of energy to the national grid over the 20 year operational life of the facility. The rationale for the establishment of a Rehabilitation Trust Fund is linked to the experiences with the mining sector in South Africa and failure of

many mining companies to allocate sufficient funds during the operational phase to cover the costs of rehabilitation and closure.

SECTION 5: KEY FINDINGS AND RECOMMENDATIONS

5.1 INTRODUCTION

Section 5 lists the key findings of the study and recommendations. These findings are based on:

- A review of the issues identified during the Scoping Process;
- A review of key planning and policy documents pertaining to the area;
- Semi-structured interviews with interested and affected parties;
- A review of social and economic issues associated with similar developments;
- A review of selected specialist studies undertaken as part of the EIA;
- A review of relevant literature on social and economic impacts; and
- The experience of the authors with other solar energy projects in South Africa.

5.2 SUMMARY OF KEY FINDINGS

The key findings of the study are summarised under the following sections:

- Fit with policy and planning
- Construction phase impacts
- Operational phase impacts
- Cumulative Impacts
- Decommissioning phase impacts
- No-development option

5.2.1 Policy and planning issues

The key documents reviewed included:

- The National Energy Act (2008)
- The White Paper on the Energy Policy of the Republic of South Africa (December 1998)
- The White Paper on Renewable Energy (November 2003)
- Integrated Resource Plan (IRP) for South Africa (2010-2030);
- Northern Cape Provincial Growth and Development Strategy (2004-2014)
- Northern Cape Climate Change Response Strategy (in progress);
- Pixley ka Seme District Municipality Integrated Development Plan 2012-2016;
- Emthanjeni Local Municipality Integrated Development Plan 2012-2013;
- Emthanjeni Tourism Strategy 2010-2020.

The findings of the review indicated that solar energy is strongly supported at a national, provincial, and local level. In this regard the ELM IDP identifies De Aar as a **Renewable Energy Hub**. Based on this the establishment of the proposed Klipgat SEF is supported by the relevant policy and planning documentation.

5.2.2 Construction phase

The key social issues associated with the construction phase include:

- Creation of employment and business opportunities, and the opportunity for skills development and on-site training.

The construction phase for a 75MW SEF is expected to extend over a period of 18-24 months and create approximately 291 employment opportunities, depending on the final design. Of this total ~ 68% (198) will be available to low-skilled workers (construction labourers, security staff etc.) and semi-skilled workers (drivers, equipment operators etc.) and 32% (93) to skilled personnel (engineers, land surveyors, project managers etc.). The majority of low and semi-skilled employment opportunities are likely to be available to local residents in the area, specifically residents from Hanover, Noupoort and Middelburg. The majority of the beneficiaries are likely to be historically disadvantaged (HD) members of the community. This would represent a significant positive social benefit in an area with limited employment opportunities. However, due to the potential mismatch of skills and low education levels, the potential employment opportunities for the members from these local communities may be low. This is an issue that will need to be addressed during the recruitment process. The proponent will therefore need to demonstrate a commitment to local employment targets in order to maximise the opportunities and benefits for members from the local community.

The total wage bill for the construction phase is estimated to be in the region of R 60 million. This is based on the assumption that the average monthly salary for low, semi and skilled workers is R 5 000, R 12 000 and R 30 000 respectively. The injection of income into the area in the form of wages will represent a significant opportunity for the local economy and businesses in Hanover and Middelburg.

The capital expenditure on completion is anticipated to be in the region of R1.35 billion for a 75MW facility. In terms of business opportunities for local companies, expenditure during the construction phase will create business opportunities for the regional and local economy. However, given the technical nature of the project and high import content associated with SEF's the opportunities for the local economy and towns such as Middelburg and Hanover are likely to be limited. However, opportunities are likely to exist for local contractors and engineering companies in Middelburg and De Aar. The implementation of the enhancement measures listed below can enhance these opportunities.

The sector of the local economy that is most likely to benefit from the proposed development is the local service industry. The potential opportunities for the local service sector would be linked to accommodation, catering, cleaning, transport and security, etc. associated with the construction workers on the site. The majority of construction workers are likely to be accommodated in Middelburg and Hanover. This will create opportunities for local hotels, B&Bs, guest farms and people who want to rent out their houses. However, based on the information collected during the site visit the accommodation opportunities in the area are limited. This is an issue that the proponent will need to discuss with the ELM. The hospitality industry in the local towns is also likely to benefit from the provision of accommodation and meals for professionals (engineers, quantity surveyors, project managers, product representatives etc.) and other (non-construction) personnel involved on the project. Experience from other large construction projects indicates that the potential opportunities are not limited to on-site construction workers but also to consultants and product representatives associated with the project.

The establishment of the proposed SEF also supports the objectives set out in the NCPGDS and the PKSDM and ELM IDPs, specifically the creation of employment and economic development opportunities. The proposed SEF will also create opportunities to support SMMEs and co-operation between the public and private sector in the Northern Cape Province.

Potential negative impacts

- Impacts associated with the presence of construction workers on site
- Influx of job seekers to the area;
- Loss of farm labour to the construction phase;
- Increased risk of stock theft, poaching and damage to farm infrastructure associated with presence of construction workers on the site
- Increased risk of veld fires associated with construction-related activities
- Threat to safety and security of farmers associated with the presence of construction workers on site
- Impact of heavy vehicles, including damage to roads, safety, noise and dust
- Potential loss of grazing land associated with construction-related activities.

The significance of the majority of potential negative impacts with mitigation was assessed to be of Low significance. All of the potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. In addition, given that the majority of the low and semi-skilled construction workers can be sourced from the local area the potential risk at a community level to local family structures and social networks is regarded as Low negative significance. However, the impact on individuals who are directly impacted on by construction workers and or job seekers (i.e. contract HIV/ AIDS) was assessed to be of High negative significance.

Table 5.1 summarises the significance of the impacts associated with the construction phase.

Table 5.1: Summary of social impacts during construction phase

Impact	Significance No Mitigation	Significance With Enhancement /Mitigation
Creation of employment and business opportunities	Medium (Positive impact)	Medium (Positive impact)
Presence of construction workers and potential impacts on family structures and social networks	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)
Influx of job seekers	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)
Loss of farm labour	Low	Low

	(Negative impact)	(Negative impact)
Risk of stock theft, poaching and damage to farm infrastructure	Medium (Negative impact)	Low (Negative impact)
Risk of veld fires	Medium (Negative impact)	Low (Negative impact)
Impact of heavy vehicles and construction activities	Low (Negative impact)	Low (Negative impact)
Loss of farmland	Medium (Negative impact)	Low (Negative impact)

5.2.3 Operational phase

The key social issues affecting the operational phase include:

Potential positive impacts

- Creation of employment and business opportunities. The operational phase will also create opportunities for skills development and training;
- Benefits associated with the establishment of a Community Trust;
- The establishment of infrastructure to generate renewable energy.

The 75 MW Klipgat SEF will create ~ 60 employment opportunities during the construction phase. The majority of the employment opportunities are likely to benefit HD members of the community. The proponent has also indicated that they are committed to implementing a training and skills development programme during the operational phase. Such a programme would support the strategic goals of promoting local employment and skills development contained in the ELM IDP.

The establishment of a Community Trust funded by revenue generated from the sale of energy from the proposed Klipgat SEF also creates an opportunity to support local economic development in the area. In this regard Community Trusts provide an opportunity to generate a steady revenue stream that is guaranteed for a 20 year period. The revenue from the proposed Klipgat SEF plant can be used to support a number of social and economic initiatives in the area, including:

- Education;
- Health care;
- Training and skills development;
- Support for SMME's.

The long term duration of the revenue stream also allows local municipalities and communities to undertake long term planning for the area. Experience has however also shown that Community Trusts can be mismanaged. This issue will need to be addressed in order to maximise the potential benefits associated with the establishment of a community trust.

Due the number of other renewable energy facilities proposed in the ELM it is recommended that the ELM investigate the option of establishing a forum to assist the renewable energy sector with the establishment of Community Trusts. This would enable the ELM to ensure that the various Community Trusts established as per the requirements set out by the Department of Energy are aligned with and support the developmental objectives set out in the ELM's Integrated Development Plan (IDP) and Local Economic Development (LED) strategy.

The proposed development also represents an investment in infrastructure for the generation of clean, renewable energy, which, given the challenges created by climate change, represents a Positive social benefit for society as a whole.

Potential negative impacts

- Influx of job seekers to the area;
- Loss of farm workers to jobs associated with the operational phase;
- The visual impacts and associated impact on sense of place;
- Potential impact on tourism.

The significance of the potential negative impacts with mitigation was assessed to be of Low negative significance. The majority of the potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. However, the impact on individuals who are directly impacted on by job seekers (i.e. contract HIV/ AIDS) was assessed to be of High negative significance.

The visual impacts on landscape character associated with WEFs are highlighted in the research undertaken by Warren and Birnie (2009). In the South African context, the majority of South Africans have a strong connection with and affinity for the large, undisturbed open spaces that are characteristic of the South African landscape. Similar concerns are also likely to apply to SEFs, specifically given South African's strong attachment to the land and the growing number of renewable energy applications. However, the findings of the SIA indicate that the significance with mitigation of the potential visual impacts associated with the proposed Klipgat SEF is likely to be low. In addition, the ELM has identified renewable energy as a key growth sector.

The significance of the impacts associated with the operational phase are summarised in Table 5.2.

Table 5.2: Summary of social impacts during operational phase

Impact	Significance No Mitigation	With Enhancement /Mitigation
Creation of employment and business opportunities	Medium (Positive impact)	Medium (Positive impact)
Establishment of Community Trust	Medium (Positive impact)	High (Positive impact)
Establishment of infrastructure for the generation of renewable energy	Medium (Positive impact)	Medium (Positive impact)
Influx of job seekers	Medium (Negative impact for community as a whole) Medium-High (Negative impact of individuals)	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)
Loss of farm labour	Low (Negative impact)	Low (Negative impact)
Visual impact and impact on sense of place	Medium (Negative impact)	Low (Negative impact)
Impact on tourism	Low (Positive and Negative)	Low (Positive and Negative)

5.2.4 Transmission line options

The findings of the SIA indicate that the social impacts associated with the power line are likely to be low.

5.2.5 Assessment of cumulative impacts

The cumulative impacts associated with solar energy facilities, such as the proposed Klipgat SEF, are largely linked to the visual impact on the areas sense of place and landscape character.

In the case of the proposed Klipgat SEF, there are ~ 10 SEFs proposed in the PKSDM, the majority of which are located around De Aar, Prieska and Hanover west of the N1. Klipgat is the only SEF one in ELM east of the N1. Two SEFs and one WEF are proposed south of Noupoot (i.e. 20-30 km away). However, the volume of traffic on the Dwaal Road is extremely low. The potential cumulative impacts associated with sequential visibility (e.g. the effect of seeing two or more wind farms (solar facilities) along a single journey, e.g. road or walking trail) is therefore likely to be low.

Despite this it is recommended that the environmental authorities consider the overall cumulative impact on the rural character and the areas sense of place before a final decision is taken with regard to the optimal number of renewable energy facilities in the area. In addition, the final location of individual components of the SEF should be informed by findings of the relevant VIAs, specifically with respect to the visual impact on farmsteads and important roads in the area.

The proposed Klipgat SEF and establishment of the other renewable energy projects in the area also have the potential to result in significant positive cumulative socio-economic impacts for the ELM. The positive cumulative impacts include creation of employment, skills development and training opportunities (construction and operational phase), creation of downstream business opportunities and stimulation of the local property market. The significance of this impact is rated as High positive with enhancement.

5.2.6 Assessment of no-development option

The No-Development option would represent a lost opportunity for South Africa to supplement its current energy needs with clean, renewable energy. Given South Africa's position as one of the highest per capita producer of carbon emissions in the world, this would represent a negative social cost. The no-development option also represents a lost opportunity in terms of the employment and business opportunities (construction and operational phase) associated with the proposed SEF and the benefits associated with the establishment of a Community Trust. This also represents a negative social cost. The no-development option without mitigation is rated as medium negative significance. With mitigation, which assumes, that the proposed SEF is developed, the significance is rated as medium positive.

5.2.7 Decommissioning phase

Given the relatively small number of people employed during the operational phase (~ 60), the social impact on the local community associated with decommissioning is likely to be low. In addition, the potential impacts can be effectively managed with the implementation of a retrenchment and downscaling programme. With mitigation, the impacts are assessed to be Low (negative).

The proponent should also investigate the option of establishing an Environmental Rehabilitation Trust Fund to cover the costs of decommissioning and rehabilitation of disturbed areas. The Trust Fund should be funded by a percentage of the revenue generated from the sale of energy to the national grid over the 25-30 year operational life of the facility. The rationale for the establishment of a Rehabilitation Trust Fund is linked to the experiences with the mining sector in South Africa and failure of many mining companies to allocate sufficient funds during the operational phase to cover the costs of rehabilitation and closure.

5.3 CONCLUSIONS AND RECOMMENDATIONS

The findings of the SIA indicate that the development of the proposed Klipgat SEF will create employment and business opportunities for locals during both the construction and operational phase of the project. The enhancement measures listed in the report should be implemented in order to enhance these benefits. In addition, the proposed establishment of a number of other renewable energy facilities in the area will create significant socio-economic opportunities for the area and the ELM, which, in turn, will result in a positive social benefit. These benefits will assist to offset the negative impacts associated with the decline in the mining sector over the last 20 or so years.

The establishment of a Community Trust funded by revenue generated from the sale of energy from the proposed SEF also creates an opportunity to support local economic development in the area. Given the size of the proposed facility (75MW) this will represent a significant social benefit for an area where there are limited opportunities.

The proposed development also represents an investment in clean, renewable energy infrastructure, which, given the challenges created by climate change, represents a positive social benefit for society as a whole. The establishment of the proposed Klipgat SEF is therefore supported by the findings of the SIA.

However, the potential impacts associated with wind and solar energy facilities on the areas sense of place and landscape cannot be ignored. These impacts are an issue that will need to be addressed by the relevant environmental authorities, specifically given the large number of applications for renewable energy facilities in the area.

5.4 IMPACT STATEMENT

The findings of the SIA undertaken for the proposed Klipgat SEF indicate that the development will create employment and business opportunities for locals during both the construction and operational phase of the project. The establishment of a Community Trust will also create an opportunity to support local economic development in the area. The development of renewable energy has also been identified as key growth sector by the ELM and also represents an investment in clean, renewable energy infrastructure, which, given the challenges created by climate change, represents a positive social benefit for society as a whole.

It is therefore recommended that the SEF as proposed be supported, subject to the implementation of the recommended enhancement and mitigation measures contained in the report.

ANNEXURE A

PERSONAL

- Fritz, Cllr. Annie (13-11-12). Umsobomvu Local Municipality: Ward 1 Councillor (Noupoort).
- Geyer, Mr. Anton (12-11-12). Construction supervisor N9/ N10 upgrades (Noupoort), Haw & Ingles construction.
- Joka, Mr. Humphrey (13-11-12). Hannover satellite office manager: Emthanjeni Local Municipality.
- Jordaan, Mr. Tollie (09-11-12 – telephonic) Vrede Farm (Naauw Poort), Noupoort.
- Madyo, Mr. Sandisile (12-11-12). LED Manager: Pixley ka Seme District Municipality.
- Malherbe, Mr. Ben (12-11-12). Head Planner: Umsobomvu Local Municipality.
- Minnaar, Mr. Neville (12-11-12). Farm worker: Holvlakte/ Klipgat Farm, Hannover.
- Nieuwoudt, Mr. Handré (09-11-12 – telephonic) Holvlakte/ Klipgat Farm, Hannover.
- Odendaal, Ms. Michelle (12-11-12). Manager: The Don Guesthouse, Noupoort.
- Sestile, Cllr. M (13-11-12). Umsobomvu Local Municipality: Ward 1 Councillor.
- Singapo, Mr. Toontjies (13-11-12). Farm supervisor, Vrede Farm, Noupoort.
- Stevens, Mr. Francois (telephonic – 09-11-12). Vlakplaas, Poortjie Farms, Hannover.
- Stonga, Cllr. (12-11-12). Emthanjeni Local Municipality: Mayor and Ward 6 Councillor (Hannover rural).
- Thomas, Cllr. N (12-11-12). Emthanjeni Local Municipality Ward 4 Councillor (Hannover).

REFERENCES

- Emthanjeni Local Municipality (2012). *Emthanjeni Local Municipality Integrated Development Plan 2012-2013*.
- Emthanjeni Local Municipality (2010) *Emthanjeni Tourism Plan 2010-2020*.
- Erasmus, BPJ (1995) *Oppad in Suid-Afrika – 'n Gids tot Suid-Afrika, Streek vir Streek*. (Johannesburg: Jonathan Ball Publishers).
- IDC of SA, DBSA, TIP (2011). *Green Jobs. An Estimate of the Direct Employment Potential of a Greening South African Economy*.
- Pixley ka Seme District Municipality (2012). *Integrated Development Plan 2012 – 2016*.
- Pixley ka Seme District Municipality (2010). *Pixley ka Seme District Municipality – Rich Heart of the Karoo and Renewable Energy Hub*.
- Pixley ka Seme District Municipality (2008). *Integrated Development Plan 2008/ 2009 Revision*.
- Provincial Government Northern Cape: Office of the Premier (2011). *Northern Cape Provincial Spatial Development Framework (Volumes 1-2)*.
- Provincial Government Northern Cape (2004). *Northern Cape Provincial Growth and Development Strategy (2004-2014)*.
- Republic of South Africa (2011). *Integrated Resource Plan (IRP) for South Africa (2010-2030)*.
- Republic of South Africa (2008). *National Energy Act, Act nr. 34 of 2008*.
- Republic of South Africa (2003). *White Paper on Renewable Energy*.
- Republic of South Africa (December 1998). *White Paper on Energy Policy*.
- Savannah Environmental (September 2012). Environmental Impact Assessment Process – Final Scoping Report: *Proposed Klip Gat 75 MW Solar Energy Facility near Noupoort, Northern Cape Province – Draft Scoping Report*.
- StatsSA Community Survey, 2007.

- University of the Free State: Centre for Development Support (2007). *The Arid Areas Programme – Volume 1: District Socio-Economic Profile and Development Plans*.

MAPS

- Chief Directorate Surveys and Mapping (2001). 3124BD Carlton 1: 50 000.
- Chief Directorate Surveys and Mapping (2001). 3124BA Dwaal 1: 50 000.
- Chief Directorate Surveys and Mapping (2001). 3124 Middelburg 1: 250 000.
- Chief Directorate Surveys and Mapping (2001). 3124BB Noupoort 1: 50 000.

INTERNET

- www.info.gov.za/speech/DynamicAction?pageid=461&sid=22143&tid=45200
- www.saexplorer.co.za
- www.statsa.gov.za
- Google Earth 2011.

ANNEXURE B: ASSESSMENT METHODOLOGY

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).

ANNEXURE C: ENVIRONMENTAL MANAGEMENT PLAN

CONSTRUCTION PHASE

Creation of employment and business opportunities

OBJECTIVE: Maximise local employment and business opportunities associated with the construction phase.

Project component/s	Construction and establishment activities associated with the establishment of the solar energy facility, including infrastructure etc.	
Potential Impact	The opportunities and benefits associated with the creation of local employment and business should be maximised.	
Activity/risk source	The employment of outside contractors to undertake the work and who make use of their own labour will reduce the employment and business opportunities for locals. Employment of local labour will maximise local employment opportunities.	
Mitigation: Target/Objective	The proponent, in discussions with the ELM, should aim to employ a minimum of 80% of the low-skilled workers from the local area where possible. This should also be made a requirement for all contractors. The proponent should also develop a database of local BBBEE service providers	
Mitigation: Action/control	Responsibility	Timeframe
<ul style="list-style-type: none"> • Aim for a minimum of 80% of the low-skilled workers are sourced from the local area; • Where required, implement appropriate training and skills development programmes prior to the initiation of the construction phase to ensure that 80% target is met. • Skills audit to be undertaken to determine training and skills development requirements; • Develop a database of local BBBEE service providers and ensure that they are informed of tenders and job opportunities; • Identify potential opportunities for local businesses 	<ul style="list-style-type: none"> • The proponent and & contractors • The proponent • The proponent • The proponent • The proponent 	<ul style="list-style-type: none"> • Employment and business policy document that sets out local employment targets to be in place before construction phase commences. • Where required, training and skills development programmes to be initiated prior to the initiation of the construction phase. • Skills audit to determine need for training and skills development programme undertaken within 1 month of commencement of construction phase commences. • Database of potential local BEE services providers to be completed before construction phase commences.
Performance Indicator	<ul style="list-style-type: none"> • Employment and business policy document that sets out local employment and targets completed before construction phase 	

	<p>commences;</p> <ul style="list-style-type: none"> • 80 % of semi and unskilled labour locally sourced where possible. • Database of potential local BBBEE services providers in place before construction phase commences. • Skills audit to determine need for training and skills development programme undertaken within 1 month of commencement of construction phase.
Monitoring	<ul style="list-style-type: none"> • The proponent and or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.

Impact associated with presence of construction workers

OBJECTIVE: Avoid the potential impacts on family structures and social networks associated with presence of construction workers from outside the area

Project component/s	Construction and establishment activities associated with the establishment of the solar energy facility, including infrastructure etc.	
Potential Impact	The presence of construction workers who live outside the area and who are housed in local towns can impact on family structures and social networks.	
Activity/risk source	The presence of construction workers can impact negatively on family structures and social networks, especially in small, rural communities.	
Mitigation: Target/Objective	To avoid and or minimise the potential impact of construction workers on the local community. This can be achieved by maximising the number of locals employed during the construction phase and minimising the number of workers housed on the site.	
Mitigation: Action/control	Responsibility	Timeframe
<ul style="list-style-type: none"> • Aim for a minimum of 80% of the low-skilled workers are sourced from the local area. This should be included in the tender documents. Construction workers should be recruited from the local area in and around Hanover • Construction workers should be able to provide proof of having lived in the area for five years or longer. • Identify local contractors who are qualified to undertake the required work; • Consider establishment of a Monitoring Forum (MF) 	<ul style="list-style-type: none"> • The proponent and contractors • The proponent • The proponent • The 	<ul style="list-style-type: none"> • Identify suitable local contractors prior to the tender process for the construction phase. • Tender documents for contractors include conditions set out in SIA, including transport of workers home over weekends, transportation of workers home on completion of construction phase, establishment of MF etc, • MF established before construction phase commences. • Code of Conduct drafted

<p>consisting of representatives from the local community, local police, local farming community and the contractor prior to the commencement of the construction phase;</p> <ul style="list-style-type: none"> • Develop a Code of Conduct to cover the activities of the construction workers housed on the site; • Ensure that construction workers attend a brief session before they commence activities. The aim of the briefing session is to inform them of the rules and regulations governing activities on the site as set out in the Code of Conduct. • Ensure that all workers are informed at the outset of the construction phase of the conditions contained on the Code of Conduct; • Ensure that construction workers who are found guilty of breaching the Code of Conduct are dismissed. All dismissals must be in accordance with South African labour legislation. • Provide opportunities for workers to go home over weekends. The cost of transporting workers home over weekends and back to the site should be borne by the contractors. • On completion of the construction phase all construction workers must be transported back to their place of origin within two days of their contract ending. The costs of transportation must be borne by the contractor. 	<p>proponent</p> <ul style="list-style-type: none"> • The proponent and contractors • The proponent and contractors and CLC • Contractors • Contractors • Contractors • Contractors 	<p>before construction phase commences.</p> <ul style="list-style-type: none"> • Briefing session for construction workers held before they commence work on site.
<p>Performance Indicator</p>	<ul style="list-style-type: none"> • Employment policy and tender documents that sets out local employment and targets completed before construction phase commences; 	

	<ul style="list-style-type: none"> • 80 % of semi and unskilled labour locally sourced where possible; • Construction workers employed have proof that they have lived in the area for five years or longer; • MF set up prior to implementation of construction phase; • Code of Conduct drafted before commencement of construction phase; • Briefing session with construction workers held at outset of construction phase;
Monitoring	<ul style="list-style-type: none"> • The proponent and or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.

Safety, poaching, stock theft and damage to farm infrastructure

OBJECTIVE: To avoid and or minimise the potential impact of the activities during the construction on the safety of local communities and the potential loss of stock and damage to farm infrastructure.

Project component/s	Construction and establishment activities associated with the establishment of the solar energy facility, including infrastructure etc.	
Potential Impact	Impact on safety of farmers and communities (increased crime etc.) and potential loss of livestock due to stock theft by construction workers and also damage to farm infrastructure, such as gates and fences.	
Activity/risk source	The presence of construction workers on the site can pose a potential safety risk to local farmers and communities and may also result in stock thefts. The activities of construction workers may also result in damage to farm infrastructure.	
Mitigation: Target/Objective	To avoid and or minimise the potential impact on local communities and their livelihoods.	
Mitigation: Action/control	Responsibility	Timeframe
<ul style="list-style-type: none"> • The housing of construction workers on the site should be limited to security personnel; • Establish a MF with the adjacent farmers and develop a Code of Conduct for construction workers. • Inform all workers of the conditions contained in the Code of Conduct. • Dismiss all workers that do not adhere to the code of conduct for workers. All dismissals must be in accordance with South African labour legislation. • Compensate farmers / 	<ul style="list-style-type: none"> • The proponent and contractors • The proponent • The proponent and contractor • Contractors • Contractors 	<ul style="list-style-type: none"> • Establish MF before construction phase commences. • Develop Code of Conduct prior to commencement of construction phase. The Code of Conduct should be signed by The proponent and the contractors before the contractors move onto site; • Inform all construction workers of Code of Conduct requirements before construction phase commences. • Compensate Farmers / community members within 1 month of claim being verified

community members at full market related replacement cost for any losses, such as livestock, damage to infrastructure etc.		by the proponent and or Contractor/s.
Performance Indicator	<ul style="list-style-type: none"> • Community MF in place before construction phase commences. • Code of Conduct developed and approved prior to commencement of construction phase. • All construction workers made aware of Code of Conduct within first week of being employed. • Compensation claims settled within 1 month of claim being verified by Community MF. 	
Monitoring	<ul style="list-style-type: none"> • The proponent and or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase. 	

Increase risk of grass fires

OBJECTIVE: To avoid and or minimise the potential risk of increased veld fires during the construction phase.

Project component/s	Construction and establishment activities associated with the establishment of solar energy facility, including infrastructure etc.	
Potential Impact	Grass fires can pose a personal safety risk to local farmers and communities, and their homes, crops, livestock and farm infrastructure, such as gates and fences.	
Activity/risk source	The presence of construction workers and their activities on the site can increase the risk of grass fires.	
Mitigation: Target/Objective	To avoid and or minimise the potential risk of grass fires on local communities and their livelihoods.	
Mitigation: Action/control	Responsibility	Timeframe
<ul style="list-style-type: none"> • Ensure that open fires on the site for cooking or heating are not allowed except in designated areas. • Provide adequate fire fighting equipment onsite. • Provide fire-fighting training to selected construction staff. • Compensate farmers / community members at full market related replacement cost for any losses, such as livestock, damage to infrastructure etc. 	<ul style="list-style-type: none"> • The proponent and contractors • The proponent and contractors • Contractors • Contractors 	<ul style="list-style-type: none"> • Ensure that these conditions are included in the Construction Phase EMP. • Ensure that designated areas for fires are identified on site at the outset of the construction phase. • Ensure that fire fighting equipment and training is provided before the construction phase commences. • Compensate Farmers within 1 month of claim being verified by MF.
Performance Indicator	<ul style="list-style-type: none"> • Conditions contained in the Construction EMP. • Designated areas for fires identified on site at the outset of the construction phase. • Fire fighting equipment and training provided before the 	

	<p>construction phase commences.</p> <ul style="list-style-type: none"> • Compensation claims settled within 1 month of claim being verified by Community MF.
Monitoring	<ul style="list-style-type: none"> • The proponent and or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.

Impact of dust and noise due to heavy vehicles and damage to roads

OBJECTIVE: To avoid and or minimise the potential impacts of safety, noise and dust and damage to roads caused by construction vehicles during the construction phase.

Project component/s	Construction and establishment activities associated with the establishment of the solar energy facility, including infrastructure etc.
Potential Impact	Heavy vehicles can generate noise and dust impacts. Movement of heavy vehicles can also damage roads.
Activity/risk source	The movement of heavy vehicles and their activities on the site can result in noise and dust impacts and damage roads.
Mitigation: Target/Objective	To avoid and or minimise the potential noise and dust impacts associated with heavy vehicles, and also minimise damage to roads.

Mitigation: Action/control	Responsibility	Timeframe
<ul style="list-style-type: none"> • Implement dust suppression measures for heavy vehicles such as wetting roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers. • Ensure that all vehicles are road-worthy, drivers are qualified and are made aware of the potential noise, dust and safety issues; • Ensure that drivers adhere to speed limits. Vehicles should be fitted with recorders to record when vehicles exceed the speed limit; • Ensure that damage to roads is repaired before completion of construction phase. 	<ul style="list-style-type: none"> • Contractors • Contractors • Contractors • Contractors 	<ul style="list-style-type: none"> • Ensure that these conditions are included in the Construction Phase EMP. • Ensure that dust suppression measures are implemented for all heavy vehicles that require such measures during the construction phase commences. • Ensure that drivers are made aware of the potential safety issues and enforcement of strict speed limits when they are employed. • Fit all heavy vehicles with speed monitors before they are used in the construction phase. • Assess road worthy status of heavy vehicles at the outset of the construction phase and on a monthly basis thereafter; • Ensure that damage to roads is repaired before completion

		of construction phase.
Performance Indicator	<ul style="list-style-type: none"> • Conditions included in the Construction Phase EMP. • Dust suppression measures implemented for all heavy vehicles that require such measures during the construction phase commences. • Drivers made aware of the potential safety issues and enforcement of strict speed limits when they are employed. • All heavy vehicles equipped with speed monitors before they are used in the construction phase. • Road worthy certificates in place for all heavy vehicles at outset of construction phase and up-dated on a monthly basis. 	
Monitoring	<ul style="list-style-type: none"> • The proponent and or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase. 	

Impact on farming activities

OBJECTIVE: To avoid and or minimise the potential impact on current and future farming activities during the construction phase.

Project component/s	Construction phase activities associated with the establishment of the solar energy facility and associated infrastructure.	
Potential Impact	The footprint of the solar energy facility and associated infrastructure will result in a loss of land that will impact on farming activities on the site.	
Activity/risk source	The footprint taken up by the solar energy facility and associated infrastructure.	
Mitigation: Target/Objective	To minimise the loss of land taken up by the solar energy facility and associated infrastructure and to enable farming activities to continue where possible, specifically grazing.	
Mitigation: Action/control	Responsibility	Timeframe
<ul style="list-style-type: none"> • Minimise the footprint of the solar energy facility and the associated infrastructure. • Rehabilitate disturbed areas on completion of the construction phase. Details of the rehabilitation programme should be contained in the EMP. • Investigate the possibility of allowing farmers in the area to continue to use the site for grazing, or the option of leasing the land for grazing to other local farmers and possibly emerging farmers. 	<ul style="list-style-type: none"> • Savannah Environmental and the proponent • ECO and Contractors • The proponent 	<ul style="list-style-type: none"> • Footprint for solar energy facility should be defined in the Construction EMP before construction phase commences. • Rehabilitation should be ongoing and completed within 3 months of the completion of the construction phase. • Meeting/s with local farmers to discuss lease options should take place during the construction phase.
Performance	<ul style="list-style-type: none"> • Footprint of solar energy facility included in the Construction 	

Indicator	Phase EMP. <ul style="list-style-type: none"> Meeting/s held with farmers during construction phase.
Monitoring	<ul style="list-style-type: none"> ECO must monitor indicators listed above to ensure that they have been met for the construction phase.