

**PROPOSED KAROSHOEK SOLAR VALLEY DEVELOPMENT NEAR
UPINGTON, NORTHERN CAPE PROVINCE**

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GLOSSARY OF ABBREVIATIONS

CPVPD:	Concentrating Photovoltaic or Parabolic Dish
CSP:	Concentrating Solar Power
DEA:	Department of Environmental Affairs
DOE :	Department of Energy
EIA:	Environmental Impact Assessment
EMP:	Environmental Management Plan
EPC:	Engineering, Procurement, and Construction
HDSA:	Historically Disadvantaged South African
I&AP:	Interested and Affected Party
IDP:	Integrated Development Plan
LF:	Linear Fresnel
LFT:	Linear Fresnel or Parabolic Trough
PT:	Parabolic Trough
REFIT:	Renewable Energy Feed-in Tariff
SIA:	Social Impact Assessment
SDF:	Strategic Development Framework
SMME:	Small, Medium Size Enterprises

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1. INTRODUCTION

1.1 Background

Savannah Environmental (Pty) Ltd, as Environmental Assessment Practitioners (EAP), has been appointed by FG Emvelo Energy (Pty) Ltd (herein further referred to as FG Emvelo) to conduct an Environmental Impact Assessment (EIA) for the proposed development of the Karoshoek Solar Valley Development on a site located approximately 30 km east of Upington, Northern Cape Province.

Before a project of this nature can proceed an EIA needs to be undertaken. The EIA process consists of two phases, namely the Scoping Phase and a detailed EIA Phase. As part of the EIA process, a Social Impact Assessment (SIA) is required to be undertaken.

1.2 The proposed project

The developer, FG Emvelo, proposes to establish the Karoshoek Solar Valley Development (hereafter referred to as the Karoshoek Development), using various concentrating solar generation technologies on sites located approximately 30 km east of Upington within the //Khara Hais Local Municipality in the Northern Cape. The facility is proposed on the farms outlined below:

- Portion 0 of the farm Karos 959;
- Portion 3 of the farm Annashoek 41;
- Portion 0 of the farm Zandemm 944 (this farm is also referred to as Zand Dam);
- Portion 2 of the farm Matjiesrivier 41; and
- Portion RE of the farm Matjiesrivier 41 (This farm portion is included as it is envisaged for possible future development).

The Karoshoek Development would consist of the following project components:

Site	Project Name and Description
Site 2	Karoshoek CPVPD 1 (1 x 25 MW Concentrating photovoltaic <u>or</u> parabolic dish technology project)
	Karoshoek CPVPD 2 (1 x 25 MW Concentrating photovoltaic <u>or</u> parabolic dish technology project)
	Karoshoek CPVPD 3 (1 x 25 MW Concentrating photovoltaic <u>or</u> parabolic dish technology project)

Site	Project Name and Description
	Karoshoek CPVPD 4 (1 x 25 MW Concentrating photovoltaic <u>or</u> parabolic dish technology project)
Site 1.1	Karoshoek LF 1 (1 x 100 MW Linear Fresnel)
Site 1.3	Karoshoek PT (1 x 100 MW Parabolic Trough)
Site 1.4	Karoshoek LFT 2 (1 x 100 MW Linear Fresnel <u>or</u> Parabolic Trough)
Site 3	Karoshoek Tower 1 (1 x 50MW Tower)
	Karoshoek Tower 2 (1 x 50MW Tower)
Site 4	Karoshoek LFTT 1 (1 X 100 MW Linear Fresnel <u>or</u> Parabolic Trough <u>or</u> Tower)
Site 5	Karoshoek LFTT 2 (1 X 100 MW Linear Fresnel <u>or</u> Parabolic Trough <u>or</u> Tower)

Site 1.2 is where the already approved Ilanga Photovoltaic Facility (125 MW Parabolic Trough Plant) and its associated infrastructure would be located.

In addition to the CSP plants, some associated infrastructure will also be required for each of the proposed developments forming part of the Karoshoek Development, namely:

- Power line(s) which will connect into the Eskom electricity grid;
- Internal and external access roads;
- Accommodation facilities;
- Storerooms; and
- Temporary waste storage facilities (if required).

The main water source would be the Gariep River (Orange River) with the water abstraction point at the existing abstraction point of the Boegoeburg Water Users Association. Associated water supply pipelines, water treatment and storage reservoirs and evaporation ponds will be required. It should be noted that this infrastructure has already been authorised through the EIA process undertaken for the Ilanga project on site 1.2 (Savannah Environmental, 2011). The possible impacts of this infrastructure on the social environment will thus not be assessed as part of this document.

1.3 Map of proposed project and study area

Herewith a map of the proposed project and study area:

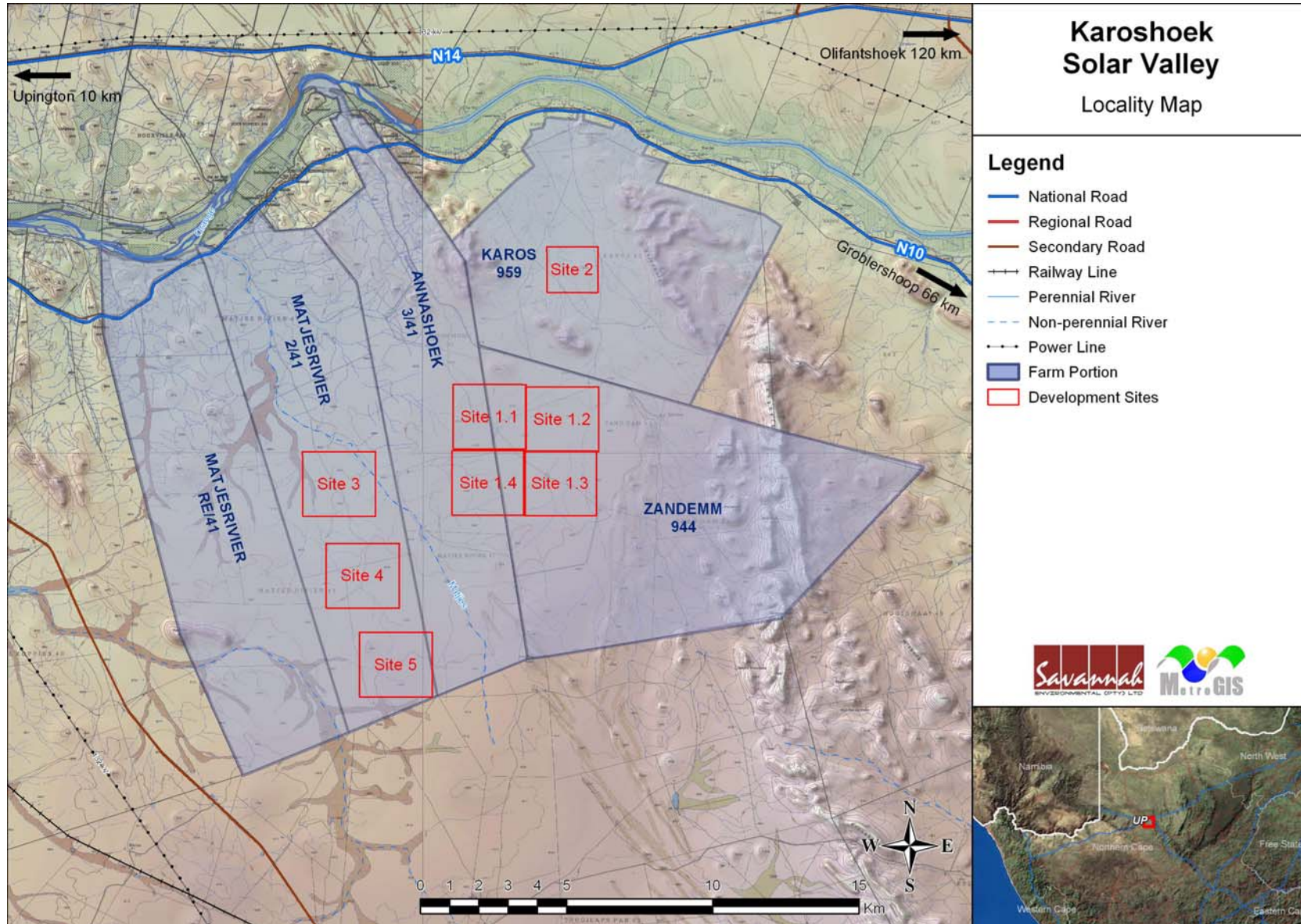


Figure 1: Karoshoek Solar Valley Development: Locality Map

1.4 Construction Process

Construction of a solar energy facility would typically entail site surveying, site preparation (e.g. clearing of vegetation at the footprint of the components for the solar field or parabolic troughs, levelling of the site), construction and establishment of internal access roads, water pipeline and power line, fencing of the site and construction of the entrance gate, transportation of components and equipment to the site, construction of foundations, supports and platforms, assembly, erection and construction of the solar fields and ancillary infrastructure (e.g. steam turbine, generator, water steam cycle pipes and pumps, air cooled condenser, transformers and so forth), implementations of the connections points by Eskom followed by the commissioning of the facility.

For each proposed plant within the Karoshoek Development, construction is estimated at two (2) to three (3) years. The construction of the Karoshoek Development would thus be phased with the different plants and the entire construction timeframe is expected to be between ten (10) to twelve (12) years (Savannah Environmental, 2012).

Impacts associated with this phase of the project is thus of a long duration, with temporary increases which could have long term effects on the surrounding environment.

1.5 Operation of the Karoshoek Development

The Karoshoek Development is anticipated to have an estimated lifespan of thirty (30) to forty (40) years, where after it could be decommissioned or expanded to continue operation. This would depend on the economic climate and electricity needs at that time.

Once operational, maintenance, such as the cleaning of the mirrors, and maintenance of the infrastructure, would be undertaken on a regular basis. General management of the facility would be on a continuous basis.

1.6 Technical Aspects of the proposed project

1.6.1 Concentrated Photovoltaic Technology

Concentrated photovoltaic (CPV) technology converts light energy into electrical energy in the same way that conventional photovoltaic technology does, but uses an advance optical system to focus a large area of sunlight onto each cell for maximum efficiency. CPV panels are mounted on trackers to keep the focal point on the cell as the sun moves across the sky.

1.6.2 Parabolic Dish

The Parabolic Dish combines a parabolic shaped point focus concentrator in the form of a dish that reflects solar radiation onto a receiver mounted at the focal point. These concentrators are mounted with a two-axis tracker to revolve around its axis to follow the sun. The collected heat is typically utilised directly by a heat engine mounted on the receiver moving with the dish structure (Savannah Environmental, 2012).

1.6.3 Parabolic Troughs

A Parabolic Trough is a type of solar thermal energy collector. It is constructed as long parabolic mirrors or trough shaped reflectors with receiver pipes or tubes running along the inside of the curved surfaces. The sun's energy is used to heat oil or molten salts through the pipe and the heat energy is then used to generate electricity in a conventional power block. A solar field comprises many troughs in parallel rows aligned on a north-south axis. This layout enables the single-axis troughs to track the sun as it moves from east to west across the sky. This then ensures that the sun is continuously focused to the receiver tubes (Savannah Environmental, 2012).

Trough designs can incorporate thermal storage allowing for electricity generation several hours into the evening. Troughs can also be hybridised with other fuels such as coal, gas or biomass (Savannah Environmental, 2012).

1.6.4 Linear Fresnel

Linear Fresnel technology is an evolution from the parabolic trough technology. The reflectors use flat, long segments of glass mirrors to focus sunlight onto a fixed absorber (receiver) located at a common focal point of the reflectors. Water is vaporised in the receiver and parabolically curved mirrors are thus not used (Savannah Environmental, 2012).

Fresnel plants can be designed to incorporate thermal storage (Savannah Environmental, 2012).

1.6.5 The tower

The tower is based on concentrated solar power with an array of heliostats on a central receiver mounted atop a tower more than 100 metres high. The liquid running through the receiver absorbs highly concentrated solar radiation in the receiver and converts it into thermal energy for use in the generation of steam, which runs the turbine and thus generates electricity (Savannah Environmental, 2012).

2. DEFINITION OF A SOCIAL IMPACT ASSESSMENT

Burdge (1995) describes a Social Impact Assessment as the "...systematic analysis in advance of the likely impacts a development event (or project) will have on the day-to-day life (environmental) of persons and communities." A SIA therefore attempts to predict the probable impact of a development (before the development actually takes place) on people's way of life (how they live, work, play, and interact with one another on a daily basis), their culture (their shared beliefs, customs, and values) and their community (its cohesion, stability, character, services, and facilities), by:

- Appraising the social impacts resulting from the proposed project;
- Relating the assessed social impacts of the project to future changes in the socio-economic environments that are not associated with it. This would serve to place the impacts of the project into context;
- Using the measurements (rating) to determine whether the impacts would be negative, neutral or positive;
- Determining the significance of the impacts; and
- Proposing mitigation measurements.

An SIA is thus concerned with the human dimensions of the environment, as it aims to balance social, economic, and environmental objectives and seeks to predict, anticipate, and understand the potential impacts of development.

The usefulness of an SIA as a planning tool is immediately clear, in that it can assist the project proponent to conceptualise and implement a project in a manner which would see the identified negative social impacts addressed through avoidance or mitigation and the positive impacts realised and optimised. It would also allow the community to anticipate, plan for, and deal with the social changes once they come into effect. In this sense then, the SIA is an indispensable part of the EIA, the Environmental Management Plan (EMP) and any participative activity (e.g. community involvement in mitigation and monitoring during planning and implementation).

3. PURPOSE OF THE SOCIAL IMPACT ASSESSMENT REPORT

The aim of the Social Impact Assessment Report is to:

- Determine the current socio-economic status of the area and the social characteristics of the receiving environment;
- Indicate the anticipated core impact categories and impact areas (possible hot spots);

- Identify anticipated positive socio-economic impacts of the proposed project, including positive impacts and provide management measures for these impacts;
- Identify and highlight negative socio-economic impacts (social hot spots) of the proposed project and indicate mitigation measures to deal with these impacts;
- Present the findings, recommendations, and conclusions of the social study.

4. METHODOLOGY

The broad steps followed as part of the Social Impact Assessment are discussed below.

4.1 Scope of the Assessment

Based on information received from Savannah Environmental, the scope of the assessment was determined. A site visit was not undertaken as the sites were visited as part of the Ilanga Project EIA undertaken in 2010 and 2011. The consultant is thus familiarised with the area and the social characteristics of the receiving environment.

4.2 Literature Review, Analysis and Desktop Studies

The literature review and desktop studies undertaken as part of the Ilanga Project assisted the consultants in establishing the social setting and characteristics of the study area, as well as the key economic activities.

4.3 Data Gathering

Secondary data, which was not originally generated for the specific purpose of the study, were gathered and analysed for the purposes of the study. Such data included the census data, project maps, local histories, planning documentation such as the draft Integrated Development Plan (IDP) and Strategic Development Framework (SDF) of the //Khara Hais Municipality.

4.4 Profiling

Profiling involves a description of the social characteristics and history of the area being assessed, an analysis of demographic data, changes in the local population, and the land-use pattern in the study area, as well as any other significant developments in the area and thus social character over time. This could include information on:

- Historical background;

- Social characteristics;
- Culture, attitudes and socio-psychological conditions;
- Population characteristics;
- Community and institutional structures;
- Community resources; and
- Broad economic impacts.

The broad profiling will typically include descriptions regarding the following:

- The social trends and current conditions;
- The land-use in the area;
- The demographical profile and social characteristics of the host community;
- Other potential developments in the area;
- The local and regional economy; and
- Potential economic links between the proposed project and its environs.

4.5 Projection and Estimation of effects

A baseline assessment indicates the current reality in the social and related aspects of the affected environment. A baseline assessment is necessary to enable a logical and theoretically sound analysis of social impacts. It forms part of the process of identifying important cause-and-effect relationships and a comparative framework for anticipated changes and impacts.

The output of this phase is the impact matrix and mitigation measures.

4.6 Variables

The following variables are typically assessed (Burdge, 1995) as part of the Social Impact Assessment:

- Population impacts;
- Community/institutional arrangements;
- Conflicts between local residents and newcomers;
- Individual and Family level impacts;
- Community infrastructure needs; and

- Intrusion impacts.

For assessing the impacts associated with the proposed project, the above variables were adapted to allow the assessment of the full range of social impacts relevant to the specific project. These variables would relate to the construction and operational phases of the proposed project.

4.7 Significance Criteria

During the Environmental Impact Assessment Phase, the anticipated social impacts were rated according to a rating approach used and specified by Savannah Environmental. This rating approach is described below:

CATEGORY	DESCRIPTION
Nature	A description of what causes the effect, what will be affected, and how it will be affected.
Extent	Whether the impact will be local (limited to the immediate area or site of development) or regional. A value between 1 and 5 will be assigned as appropriate (1 = low and 5 = high).
Duration	Where it will be indicated whether: <ul style="list-style-type: none"> • The lifetime of the impact will be of a very short duration of 0 – 1 years: Assigned a score of 1 • The lifetime of the impact will be of a short duration of 2 – 5 years: Assigned a score of 2 • Medium term of 5 – 15 years: Assigned a score of 3 • Long term (more than 15 years): Assigned a score of 4 • Permanent: Assigned a score of 5
Magnitude	This is quantified on a scale of 0-10, where <ul style="list-style-type: none"> • 0 is <i>small</i> and will have no effect on the environment; • 2 is <i>minor</i> and will not result in an impact on processes; • 4 is <i>low</i> and will cause a slight impact on processes; • 6 is <i>moderate</i> and will result in processes continuing but in a modified way; • 8 is <i>high</i> where processes are altered to the extent that they temporarily

CATEGORY	DESCRIPTION
	<p>cease; and</p> <ul style="list-style-type: none"> • 10 is <i>very high</i> and results in complete destruction of patterns and permanent cessation of processes.
Probability	<p>The probability of occurrence describes the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5, where:</p> <ul style="list-style-type: none"> • 1 is <i>very improbable</i> (probably will not happen) • 2 is <i>improbable</i> (some possibility, but low likelihood) • 3 is <i>probable</i> (distinct possibility) • 4 is <i>highly probable</i> (most likely) • 5 is <i>definite</i> (impact will occur regardless of any prevention measures)
Significance	<p>The significance shall be determined through a synthesis of the characteristics described above and can be assessed as <i>low, medium or high</i>.</p> <p>The significance weightings for each potential impact are as follows:</p> <ul style="list-style-type: none"> • Less than 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) • More than 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area) <p>The significance is calculated by combining the criteria in the following formula:</p> $S = (E+D+M)P$ <p>S= Significance weighting E= Extent D= Duration M= Magnitude P= Probability</p>
Status	The Status will be described as <i>positive, negative, or neutral</i> .
Reversibility	The degree to which the impact can be reversed.

CATEGORY	DESCRIPTION
Irreplaceable loss of resources?	The degree to which the impact may cause irreplaceable loss of resources.
Can impacts be mitigated?	The degree to which the impact can be mitigated.
Mitigation	Description of mitigation measures.
Cumulative impacts	Identification of cumulative impacts.
Residual impacts	Identification of residual (remaining) impacts after mitigation.

5. KEY DEMOGRAPHIC INFORMATION

5.1 General Description of the Study Area

The proposed sites fall within the municipal jurisdiction of the //Khara Hais Local Municipality and the Siyanda District Municipality in the Northern Cape Province. //Khara Hais means 'the place of trees' or 'the place of the big tree' in the Nama language. The tree referred to is apparently a large tree under which the Koranna-leader Klaas Lucas had his kraal (//Khara Hais SDF, 2008).

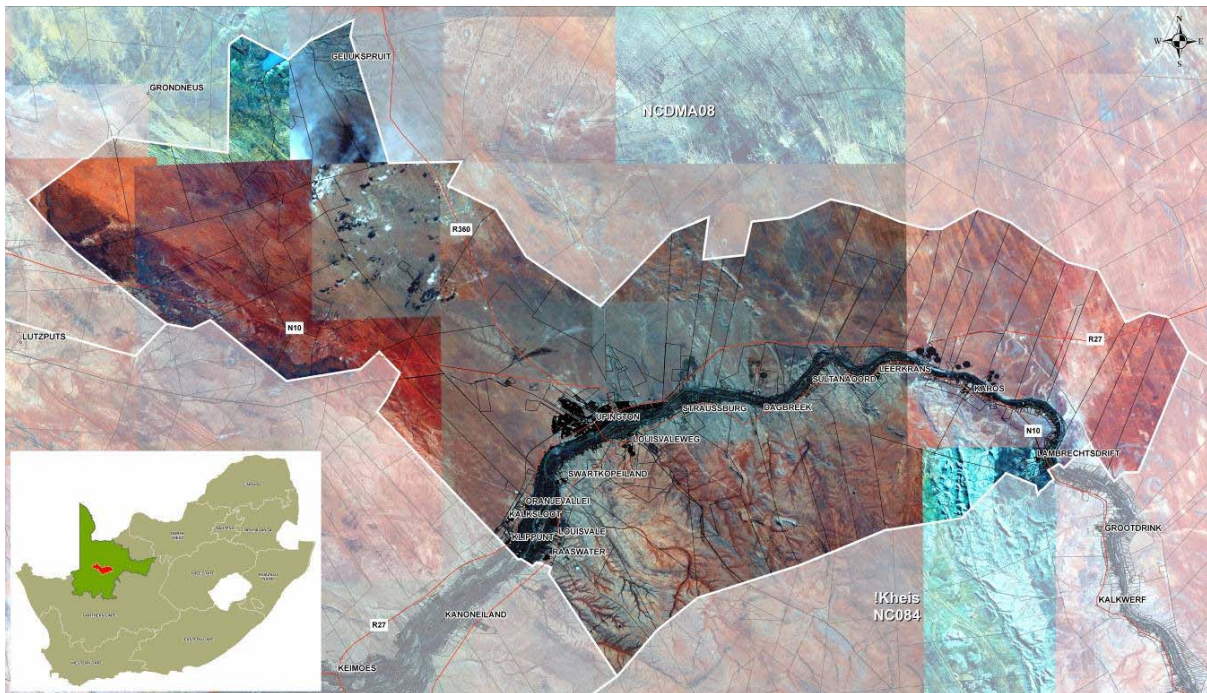
Upington is the main town of the //Khara Hais Local Municipality and serves as portal to Namibia, the Kalahari, and the Kgalagadi Transfrontier Park. Furthermore, it functions as the agricultural hub of the area (//Khara Hais SDF, 2008).

The //Khara Hais Local Municipality has twelve wards and is approximately 344 446 ha in extent and includes the following settlements:

- Upington (including Paballelo and Louisvaleweg);
- Lambrechtsdrift;
- Karos;
- Leerkrans;
- Leseding;
- Louisvale;

- Raaswater;
- 6 Brugge and Klippunt; and
- Kalksloot (//Khara Hais SDF, 2008).

The Gariep River (Orange River) is a key natural feature in this area and irrigation forms the dominant water use.



Upington and surrounding area

The study area is characterised by farmland which falls within the Boegoeberg Dam Irrigation area. The study area thus consists of various small farms along the banks of the Gariep River and larger farms to the south of the N10. Crops mostly cultivated include lucerne, grapes and wheat, with subsidiary crops of vegetables, deciduous fruits and maize (//Khara Hais SDF, 2008). The nearest town to the study area is Upington (approximately 30 km from the site), but smaller settlements such as Straussburg, Dagbreek and Leerkrans situated along the N10 are in closer proximity to the proposed site. Another “informal settlement” namely Ntsikelelo (Straussburg) can be found approximately 10 km from the site.

5.2 Population Dynamics

5.2.1 Population Figures

The Siyanda District Municipality has a population of approximately 200 000 people and has a very low population density, which is typical of most of the areas within the Northern Cape Province. The population in the //Khara Hais Municipality is mainly distributed in and around Upington, including Paballelo and Louisvaleweg. The total population count of the municipality reaches 75 671 according to the information obtained from Statistic South Africa as updated in 2005 with the new demarcation boundaries. The male and female ratio is almost equal (//Khara Hais SDF, 2008).

The Northern Cape and //Khara Hais Municipality had, over the past 10 years, experienced a slow population growth rate. The Northern Cape Province was also the only province where the population decreased between 1996 and 2001. Based upon an expected population growth rate of 2%, the Municipality calculated that the population of //Khara Hais would increase during the period from 2002 to 2012 from 72 476 (Demographic and Socio-Economic Survey estimate) to 88 348. It is estimated that the population will increase to 107 696 from 2012 to 2022. However, the Community Survey undertaken in 2007, indicated a significant increase from the 2001 Census data as the population of //Khara Hais is estimated at 100 920 for 2007 which represents an increase of 33.36% (//Khara Hais SDF, 2008).

The discrepancies in the population count and growth could negatively influence the financial and planning processes of the Municipality and subsequently influence the development and service delivery capabilities of the municipality. The //Khara Hais Local Municipality has thus launched a socio-economic survey to update the population profile with the correct figures (//Khara Hais SDF, 2008).

5.2.2 Age Groups

A third of the population (32%) in the //Khara Hais Municipal area is under the age of 15 years. As this section of the population will become economically active within the next 5 to 10 years, it would result in specific implications for future development planning. A stable, but developing economy together with the creation of satisfactory job opportunities is therefore critical.

A small percentage of the population (5%) are older than 65 years of age, but this will increase to approximately 11% over the next few years.

5.2.3 Education Levels

Nineteen percent (19%) of the population in the //Khara Hais Local Municipal area has some secondary education, while only 12% have completed Grade 12. Only 3% of the population have some form of higher education. Sixteen (16%) of the population of the Municipality is functionally illiterate, while 7% are completely illiterate. This is directly connected to low income levels and will have severe negative socio-economic implications for the area if not attended to (//Khara Hais SDF, 2008).

5.2.4 Employment Status and Income

According to the //Khara Hais SDF (2008), 63% of the total population falls within the working age category (15-65 years) and are classified as the labour market. Only 24% of these individuals are employed, 13% are unemployed, 26% are not economically active which includes housewives/homemakers, students or scholars, pensioners, and retired people as well as those not seeking work.

Of those employed (labour force), 55% earn between R401 and R1 600 per month, and 19% earn even less than R400 per month. As the employed labour force constitutes only 24%, it is thus concluded that the majority of the population lives in extreme poverty and are dependent on the income of the employed sector.

5.2.5 Employment Sectors

The tertiary sector provides more than 50% of the job opportunities within the municipal area, with the Community, Social and Services sector providing 23% of these opportunities, followed by the Wholesale, Trade and Retail Sector (18%) (//Khara Hais SDF, 2008).

5.3 Basic Services

5.3.1 Housing Provision

The //Khara Hais SDF (2008) stated that the greatest housing need in the area is experienced by young adults who need to move from their parents' house to their own accommodation, but who cannot move due to the lack of affordable housing in this category. This need is further exacerbated by students also seeking affordable accommodation.

The vast majority of those requiring housing is in need of subsidised housing (81.2%), followed by the need for flats or student accommodation (10.9%). Only 6% of the housing needs are for smaller economic stands and the remaining 1% for large economic stands (//Khara Hais SDF, 2008).

5.3.2 Sanitation Services

In 2001 approximately 4 000 households (22% of the total number of households) in //Khara Hais did not have access to water borne sanitation, but the Community Survey undertaken in 2007 indicated that only 5% of households did not have toilet facilities. These figures provide a clear indication of the progress thus made in this regard (//Khara Hais SDF, 2008).

5.3.3 Water Provision

Water is the most critical resource in the //Khara Hais Municipality which would influence sustainable development in the municipal area and Northern Cape.

Approximately 80% of households within the //Khara Hais Municipality have access to running water either by means of water points situated on their erven (39%) or from taps within their dwelling (39%). According to the Community Survey of 2007 the Municipality has made some progress with regards to water service delivery as only 4% of households still have to make use of a tap outside their yards (//Khara Hais SDF, 2008).

The majority of the households in the area (87%) also rely on a regional or local water scheme as their source of potable water with the remaining households relying on boreholes, natural springs, dams, rivers, and water vendors for their supply of water. Lambrechtsdrift, Leerkrans, Karos, Raaswater, and Louisvale are the only smaller settlements that have their own water purification plants. Other inhabitants in the municipal area are responsible for their own water provision (//Khara Hais SDF, 2008).

5.3.4 Waste Services

According to the Community Survey of 2007, the majority of households (95%) have access to proper waste services whereby waste is collected on a weekly basis (in some case less often). The main landfill site, the Dunes Landfill, is situated on the road to Keimoes, with a smaller site in close proximity to Leerkrans (//Khara Hais SDF, 2008).

5.3.5 Electricity Provision

In the past couple of years, the Municipality has increased the provision of electricity so that 93% of households now have access to electricity (//Khara Hais SDF, 2008).

Due to the fact that Upington is regarded as one of the most ideal places for the utilisation of solar power to generate electricity, the first major solar energy initiative on the African continent is planned to be constructed by Eskom in the //Khara Hais Municipality area (//Khara Hais SDF, 2008).

5.3.6 Health Services

Health services in //Khara Hais are provided by National Government, the Northern Cape Provincial Government, Siyanda District Municipality, the //Khara Hais Local Municipality and the private sector. The main health related challenges identified are:

- A shortage of qualified staff personnel;
- An increase in HIV/AIDS and Tuberculosis (TB);
- An increase in Foetal Alcohol Syndrome;
- Teenage pregnancies;
- The lack of safety of mobile clinics; and
- The upgrading of the vehicles of the mobile clinics (//Khara Hais SDF, 2008).

5.3.7 Safety and Security

The area is characterised by relatively low crime levels. The main challenges revolve around vandalism, family violence, smuggling of illegal substances, as well as alcohol and drug related violence (//Khara Hais SDF, 2008).

5.4 Resources and Land-Use

Land around the study area is used for farming which includes sheep farming, cattle farming and goat farming, as well as more intensive grape production. Livestock farming mainly takes place on the larger, privately owned farms.

The main access routes to the //Khara Hais Municipality are the national roads, namely the N14 and the N10. Regional roads include the R360 and the R27 (from Keimoes). These roads, as well as the local roads are generally in a good condition even though large volumes of heavy vehicle traffic are experienced on the main routes.

Upington airport caters for daily passenger flights from the main centres in South Africa, as well as various national and international cargo carrier flights. The establishment of an International Development Zone (IDZ) at the airport has been proposed to further enhance its strategic importance for the local, regional and provincial economy (//Khara Hais SDF, 2008).

The railway line through Upington connects the area to Karasburg in Namibia, Keimoes and Kakamas to the west of Upington and De Aar in the south, which again links with Johannesburg, Kimberley and Cape Town (//Khara Hais SDF, 2008).

5.5 Tourism and Leisure

Upington is seen as the “gateway to the Green Kalahari.” The main attractions and destinations in the area are the Augrabies Falls National Park, as well as the Kgalagadi Transfrontier Park. A small game farm, Spitskop, is situated approximately 13km to the north of Upington (//Khara Hais SDF, 2008).

Another tourist destination in Upington is Die Eiland Holiday Resort which is renowned for its palm tree avenue (200 trees) which was declared a national monument in 1982 (//Khara Hais SDF, 2008).

Some of the farms in the larger Upington area are also popular for game farming, agri-tourism, and hunting. The Orange River Wine Route includes five wineries in Upington, Kakamas, Keimoes, Grootdrink, and Groblershoop respectively. This route thus provides visitors with regular wine tours and an experience of the wine industry in the larger Upington area (//Khara Hais SDF, 2008).

The //Khara Hais Municipality hosts a number of festivals throughout the year which attracts large numbers of tourists such as the Kalahari Kuierfees, the Upington Agricultural Show (Northern Cape Expo) and the Orange River Young Wine Show.

Tourism is acknowledged as an important economic sector and job creator and should be further developed within the larger area. A broad range of tourist amenities and opportunities occur, namely:

- Agri-tourism opportunities providing insight into vineyard farming, processing of agricultural products, wine-making, and so forth;
- Conferencing;
- Culture tourism presented in Paballelo;
- Testing of vehicles within extreme conditions by car manufacturers in the area;
- Holiday accommodation (e.g. guest houses, bed-and-breakfast facilities, other types of over-night facilities, and hotels);
- River-based eco-opportunities;
- Game and eco-tourism opportunities as associated with various lodges outside of Upington; and
- Game and eco-tourism opportunities associated with the Spitskop Nature Reserve, Augrabies Falls National Park, as well as the Kgalagadi Transfrontier Park.

5.6 Economy

Agriculture forms one of the bases of the Northern Cape provincial economy contributing 7.3% to the GGP in 2002. In the study area, the Orange River supports the production of quality agricultural products (e.g. table grapes, dates, citrus products, wine, and raisins). Some of the country's finest horticultural products are grown in irrigation schemes along the Orange River and 40% of South Africa's grape exports are produced in the Upington area. The area is further known for its raisin and sultana production and thus the presence of the South Africa Dried Fruit Cooperative (SAD) and its largest processing and packaging plant outside Upington (//Khara Hais SDF, 2008).

The area is also known for its meat production, wool, mohair and karakul pelts (//Khara Hais SDF, 2008).

6. SITE 2: KAROSHOEK CONCENTRATING PHOTOVOLTAIC OR PARABOLIC DISH (CPVPD) 1, 2, 3 AND 4: POTENTIAL SOCIAL IMPACTS

6.1 Background

The Karoshoek CPVPD 1, 2, 3 and 4 entails the establishment of four different 25 MW Concentrating Photovoltaic or Parabolic dish technology project on Site 2 on the farm Karos 959/0. The site will thus consist of four different facilities which in total would have a generating capacity of 100 MW.

The larger site for the Karoshoek Development comprises an area of approximately 34 000 ha, but the development area for Site 2 is approximately 250 ha.

From a social perspective the impacts associated with the two types of technology would have similar effects on the social environment, except from a visual perspective, which would be assessed by the Visual Impact Assessment. The technology alternatives would thus not be assessed as part of the SIA.

6.2 Employment creation, local procurement and economic benefits

During the construction phase a maximum of two hundred (200) employees would be required for the construction of the entire CPVPD facility (all four facilities). These employees would consist of low skilled, semi-skilled and skilled individuals. It is highly likely that the semi-skilled and low skilled individuals could be sourced from Upington, Straussburg (Ntsikelelo), Dagbreek, Karos and Leerkrans situated along the N10 in close proximity to the proposed site. These individuals would be employed for some basic construction activities

requiring manual labour. As large sectors of the local population have been involved in the agricultural sector it is assumed that they would thus be able to undertake the basic construction activities required with the minimum additional training required. Even though this could be the case, skills training and capacity building remain imperative.

Skilled individuals could be sourced from South Africa or even include some foreigners, as the broad-spectrum profile of the local communities does not include individuals with high levels of education or experience regarding the construction and management of Concentrating Photovoltaic facilities or Parabolic dishes.

Approximately twenty (20) permanent employees would be required during the operational period of the Concentrating Photovoltaic facilities or Parabolic dishes. Due to the limited number of individuals involved it is thus anticipated that the short term employment boost during the construction phase would have a more intense impact on the local communities than the permanent employment opportunities. This benefit, however, could be further enhanced by focused training, capacity building and skills development enabling individuals to be considered for permanent employment. Should this be achieved, the short term employment benefits could be altered to long term sustainable development amongst some individual community members.

As there is a shortage of credible suppliers of the materials and equipment required for the Concentrating Photovoltaic facility or Parabolic dish, local procurement during the construction phase would only be focused on general goods, materials and services such as the hiring of construction vehicles and the transportation of the materials. During the operational life of the facility it is more likely that local services could be procured such as those required for security purposes and the general maintenance of the facility (e.g. repairs, painting of buildings and so forth).

Regional economic benefits of the Karoshoek Development would not only accrue through the creation of an additional stable electricity supply but also through the downstream benefits to the local and regional economy.

Table 1: Employment creation, local procurement and economic benefits: Construction Phase

NATURE: EMPLOYMENT CREATION, LOCAL PROCUREMENT AND ECONOMIC BENEFITS		
	Without enhancement	With enhancement
Extent	Regional (3)	Regional (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Improbable (2)	Probable (3)
Significance	Low (22) (+)	Medium (33) (+)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be enhanced?	Yes	
<p>Enhancement:</p> <ul style="list-style-type: none"> • The local labour content should be maximised as far as possible. • A skills audit should be undertaken to determine the skills available in the local communities and the discrepancy with the requirements of the project. • Training and capacity building of locals are imperative and should also aim to equip locals with sufficient skills to enable them to be employable as permanent employees. Short term construction related employment opportunities could then be changed to long term benefits which could then accrue to the local communities who are in dire need of employment. • Skills training should thus be transferable and employment opportunities sustainable. • A broad-based approach should be followed to identify and involve relevant organisations which could assist the main contractor and project proponent in identifying people whose skills may correspond with the job specifications • Employing as many locals as possible would assist in combatting crime in the area. • The project proponent and contractors should create conditions that are conducive for the involvement of entrepreneurs, small businesses, and SMMEs during the construction process. • Tender documentation should contain guidelines for the involvement of labour, entrepreneurs, businesses, and SMMEs from the local sector. 		

<ul style="list-style-type: none"> Communication efforts concerning job creation opportunities should refrain from creating unrealistic expectations.
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> Cumulative employment opportunities associated with all the components of the Karoshoek Development, and other proposed solar facilities in the Upington area Should the construction timeframes of the Karoshoek Development overlap with other proposed facilities, a lack of sufficient individuals within the study area with some skills could occur.
<p>Residual impacts:</p> <ul style="list-style-type: none"> Trained and skilled individuals as a result of the proposed Karoshoek Solar Valley Development as well as the other possible solar facilities proposed in the Upington area.

Table 2: Employment creation, local procurement and economic benefits: Operational Phase

NATURE: EMPLOYMENT CREATION, LOCAL PROCUREMENT AND ECONOMIC BENEFITS		
	Without enhancement	With enhancement
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Low (4)
Probability	Improbable (2)	Probable (3)
Significance	Low (22) (+)	Medium (33) (+)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be enhanced?	Yes	
<p>Enhancement:</p> <ul style="list-style-type: none"> The developer should capacitate locals where possible to enable them to secure full time employment. Skills development focused on the operational phase should thus start during the construction phase where practically possible. Where possible, the developer should consider training and capacity building programmes to lessen the skills disparity between the local community and the permanent jobs on offer. 		

<ul style="list-style-type: none"> • Individual tailor made training programmes for full time employees should be embarked upon in association with accredited training facilities to ensure long term benefits to those involved. • Bursaries to suitable candidates should be considered. • Long term permanent job opportunities should be advertise in a “user friendly” and easily accessible manner. • The project applicant should create conditions that are conducive for the involvement of entrepreneurs, small businesses, and SMME’s during the operational phase for rendering ancillary services to the proposed facility
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Cumulative employment opportunities associated with all the components of the Karoshoek Development, and other proposed solar facilities in the Upington area
<p>Residual impacts:</p> <ul style="list-style-type: none"> • Improved quality of life for those permanently employed • Improved socio-economic conditions for locals permanently employed • Positive economic-spin offs due to increased buying power and local economic processes

6.3 Population change

Population change refers to the inflow of temporary workers and jobseekers during the construction phase, as well as the presence of permanent personnel during the operational phase of the project.

The inflow of two hundred (200) workers to the area would have definite impacts on the local social environment of those living in close proximity to the site as the area is currently scarcely populated and characterized as a peaceful rural environment. The possible negative impacts would refer to the movement of the workers to and from the construction site, possible increased noise on site, safety and security risks, spreading of sexually transmitted diseases, littering and even social conflict between locals and these workers with regards to employment opportunities or conflict between “outside” workers and locals during after hour social contact.

Safety and security of the locals are always a source of concern when large construction workforces enter an area. It is therefore critically important to ensure that the existing security profile of the communities not be negatively affected through trespassing of properties, housebreaks and theft of goods and livestock. Construction workers should be easily identifiable and should remain at the construction site during working hours.

Some of the construction workers are likely to be sourced from outside the area as the positions available would require specific technical and management skills. Labourers and skilled employees not originally residing in the Upington area, or at the local settlements such as Strausburg (Ntsikelelo), Dagbreek, Karos and Leerkrans would thus be accommodated within the town of Upington. No accommodation facilities would therefore be established on site. The positive economic impact in this regard would thus be focused on the town of Upington where the majority of accommodation facilities are located.

Should the inflow of workers to the area be associated with the inflow of jobseekers, the negative impacts on the social environment can be increased. Due to the proximity of the farm Karos to the Leerkrans and Karos settlements it is quite likely that jobseekers would congregate at the entrance to the site at the N10 and/or the entrance to the construction site (approximately 5 km from the N10).

Positive impacts would refer to the local increased buying power and economic spin-offs associated with an increase in the local population size and density during the construction period, although this is anticipated to be felt within the larger urban nodes such as Upington and not necessarily in the study area. The negative impacts as a result of the population change on the social fabric of the locals with possible long term negative consequences thus overshadow the limited possible short-term positive economic impacts on the local farming community and those residing in the smaller settlements.

As only twenty (20) permanent employees would be involved with the operations of the Concentrating Photovoltaic facilities or Parabolic dishes, their presence would have minor impacts on the social environment, especially if local community members could be employed. No additional impact on the provision of services and infrastructure is thus foreseen, although the cumulative impact of the inflow of various individuals to the area as a result of the Karoshoek Development and other solar facilities proposed in the Upington area should be noted.

The short-term and long-term cumulative increase in the local population figures could thus have some financial bearings on the //Khara Hais Municipality if not properly managed.

Table 3: Population change: Construction Phase

NATURE: POPULATION CHANGE		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Moderate (6)	Moderate (6)

Probability	Probable (3)	Improbable (2)
Significance	Medium (33)	Low (22)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	

Mitigation:

- Locals should be employed as far as possible
- Should local accommodation facilities within the study area be available, it should be considered for housing some members of the construction workforce
- Construction workers should be transported to and from the site via busses. These vehicles should be in good working order and should adhere to all traffic related regulations
- Construction workers should be easily identifiable and should remain at the construction site during working hours
- No trespassing of private properties should be allowed
- Construction workers should be supervised at all times.
- Construction activities should be kept to normal working hours e.g. from 7 am until 5 pm during weekdays
- Employees should understand that excessive noise could be problematic and should thus attend to this issue in a sensitive manner
- Local community representatives, policing forums and those from the //Khara Hais Local Municipality should be informed of the size and presence of the construction workforce
- The construction site should be kept litter free and proper sanitation and waste management infrastructure should be implemented
- HIV/Aids awareness campaigns should be undertaken among the workforce
- The construction site should be fenced and managed by permanent security personnel
- Accommodation requirements should be communicated to the hospitality industry within Upington, representatives of the //Khara Hais Municipality and the local community forums to ensure adequate facilities are available as required for the entire workforce of the Karoshoek Development
- Workers should preferably not be accommodated within the smaller settlements such as Karos and Leerkrans as these settlements would probably require additional or upgrading of existing

<p>infrastructure and services to lodge additional individuals. This could then result in planning and undesirable cost implications to the //Khara Hais Municipality.</p>
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Possible need for additional accommodation facilities due to the entire Karoshoek Development and the other developments taking place within the Upington area • Possible additional pressure on services and infrastructure regarding the inflow of people due to the Karoshoek Development and the other planned solar facilities in the Upington area • Increased safety and security risks • Increased health risks
<p>Residual impacts:</p> <ul style="list-style-type: none"> • Long term consequences concerning the provision of services and implementation of infrastructure should construction workers from outside the study area remain in the area without suitable accommodation facilities or permanent employment • Possible permanent increased population size

Table 4: Population change: Operational Phase

NATURE: POPULATION CHANGE		
	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	Medium (33)	Low (18)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Normal working hours (e.g. 6am to 6pm) should be considered. • Locals should be employed as far as possible. 		

Cumulative impacts:

- The cumulative impact of the inflow of various individuals to the area as a result of the Karoshoek Development and other solar facilities proposed in the Upington area should be noted

Residual impacts:

- Possible permanent increased population size

6.4 Impact on farming activities

The impact on the farming activities refers to crop production as well as any other type of farming activities undertaken on the affected property and the surrounding properties, e.g. cattle, sheep and game farming.

Impacts on the vegetation due to construction activities such as site preparation and clearing would have a definite impact on the agricultural and farming activities undertaken on the property. The increased risk of veld fires, as a result of construction worker conduct and/or activities, also remains of serious concern to the farmers in the area. Other intrusion impacts as a result of construction activities would relate to noise and dust pollution. Currently the property is used for game farming and leisure activities. As vegetation would be lost (approximately 250 ha), a negative impact on the grazing capacity of the property (6 000 ha) would occur. To limit the negative impacts in this regard it is proposed that the CPVPD facility be fenced to ensure the continuation of game farming activities on the remaining section of the property.

High potential farming areas exist along the Gariep River where grapes and raisins are produced. These are situated to the north of the N10 and the farm Karos and would thus not be directly affected by the proposed CPVPD facility on the farm Karos 959. It is furthermore not anticipated that the construction activities or the proposed facility on the farm Karos would have direct negative impacts on the farming activities of the neighbouring property owners to the eastern side and northwestern side of the property, except if livestock theft occurs on those properties and if the safety and security of those farmers are compromised due to the influx of workers to the area.

Of concern to the farmers in the area is the recruitment of local labourers for the proposed development and the remuneration packages offered. Should the local labourers usually used for the harvesting (January until March) and pruning activities (July to August) be employed as part of the permanent construction team for the entire construction period, it would result in a situation whereby the local farmers would not have sufficient resources available to assist them with their farming practices. Although such a concern could materialise, it should be noted that some local farmers are not only employing local labourers during the pruning and

harvesting seasons and are already sourcing labourers or adding to their labour content by recruiting additional individuals from nearby towns or outside the municipal area (e.g. from Kuruman, Kakamas, Keimoes, and so forth). Should there be a shortage of local labourers, it is however anticipated that it could again be mitigated by sourcing temporary labourers from elsewhere to assist the farmers with their farming practices during peak times. As the applicant could further limit this impact by rather employing labourers that are not involved with the grape and raisin farming industry, one cannot restrict those farm workers to apply for employment at the facility.

Another possible impact relates to contesting remuneration packages. Concerns relate to the possibility that the employment opportunities created because of the presence of the facility in the area would lead to a situation that remuneration packages for farm workers would have to be adopted to compete with those packages provided to employees at the facility with subsequent negative financial impacts to the farmers.

From a social perspective, the impacts discussed above could thus occur but is expected to respond to mitigation.

Table 5: Impact on farming activities: Construction Phase

NATURE: IMPACT ON FARMING ACTIVITIES		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Improbable (2)
Significance	Medium (33)	Low (22)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	Yes at development footprint	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> Construction activities should not interfere with the farming activities that would continue on the larger site. Local labourers should be used during the construction phase to limit the inflow of outsiders to 		

<p>the area.</p> <ul style="list-style-type: none"> Remuneration packages should be market related and should take note of the sensitivities at hand.
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> Possibility of insufficient numbers of farm workers available for nearby farmers during the peak seasons
<p>Residual impacts:</p> <ul style="list-style-type: none"> None anticipated

Table 6: Impact on farming activities: Operational Phase

NATURE: IMPACT ON FARMING ACTIVITIES		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (39)	Medium (33)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	Yes, but only at footprint of facility	
Can impacts be mitigated?	Yes	
<p>Mitigation:</p> <ul style="list-style-type: none"> The facility should be fenced to enable the property owner to continue with game farming activities if feasible. 		
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> Cumulative loss of farmland as a result of the entire Karoshoek Development and other facilities proposed in the area 		
<p>Residual impacts:</p> <ul style="list-style-type: none"> Permanent loss of grazing areas and sterilisation of the land for farming practices due to footprint of facility. 		

- Possible economic losses due to downscaling of farming activities
- Possible continuation of farming activities on larger site not affected by the footprint of the facility.

6.5 Impact on daily living and movement patterns

The impacts on the daily living and movement patterns on the local community would mainly refer to the intrusions felt during the construction phase, such as the increase in movement of workers in the area, increase in traffic levels and associated increased risks of accidents, as well as noise and dust pollution. During the operational phase, the impacts on the living and movement patterns of the local communities are not anticipated to be severe.

An increase of people movement could likely increase the possibility of criminal activities in the area such as housebreaks, theft of livestock, crops and materials. To avoid such negative impacts especially during the construction phase, strict safety and security measures should be put in place. It should, however, be noted that the developer and/or contractors cannot be held responsible for worker conduct after working hours.

Movement of construction personnel and construction equipment and material (e.g. graders, cement trucks, trucks, excavators and so forth) would negatively impact on the daily living and movement patterns of residents in the area. The N10 would be the only main access route to be used between Upington and the construction site. The road is not currently under pressure from large volumes of traffic although various heavy vehicles make use of this section of the road, mainly to transport agricultural produce. Additional heavy traffic, however, during the construction period would thus increase the overall risk of accidents (vehicle and pedestrians) on the N10, especially at sharp bends and at the local settlements. Traffic from Upington would pass Leerkrans where school children frequently cross the road and specific safety precautions in this area could thus be required. Additional concerns relate to the possible impact on the road surface as a result of the overall traffic increase during the entire Karoshoek Development's construction phase and the anticipated lack of funding from government departments to upgrade and repair damages to the road.

The transportation of some type of equipment during the construction phase, however would require upgrading of the roads e.g. widening on corners to ensure that the road infrastructure can accommodate these abnormal vehicles. This expense, however, would have to be funded by the developer and not the local or provincial government.

An existing access road from the N10 would be used to access the site. The entrance to the site on a bend is of concern with regards to the turning of vehicles into the access road.

Possible upgrading of the entrance would be required. No additional new access roads are thus envisaged. Internal access roads, however, would have to be constructed to link the various facilities to each other and to the main access road. The usage of the gravel roads would thus result in dust and possible noise pollution during the construction phase and the long term loss of additional agricultural land.

The area is considered to have low ambient noise levels. Construction activities, vehicle movement and workers on site would result in intermittent noise pollution. Sensitive receptors, such as homesteads and other type of dwellings located to the south of the N10 and to the north of the farm Karos, a homestead on the farm Karos (not permanently inhabited), as well as the Leerkrans and Karos settlements could be negatively affected by the increased noise. It is anticipated that the noise impact would be minimal due to the distance of these receptors to the facility.

The presence of the anticipated twenty (20) workers on site during the operational phase and the movement to and from the site would not have any significant impacts on the social environment in the long term, except for the change in the character of the area. This issue is further discussed under Section 6.6.

Table 7: Impact on daily living and movement patterns: Construction Phase

NATURE: IMPACT ON DAILY LIVING AND MOVEMENT PATTERNS		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Moderate (6)	Moderate (4)
Probability	Highly Probable (4)	Probable (3)
Significance	Medium (44)	Low (27)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> The construction site and storage areas should be fenced off to avoid unauthorised entry 		

<ul style="list-style-type: none"> • Construction vehicles and those transporting materials and goods should be inspected to ensure that these are in good working order and not overloaded. • Construction vehicles should adhere to the speed limits and traffic regulations. • Upgrading of the entrance to the site from the N10 should be investigated and discussed with the relevant road agency or department. • Additional access roads at the construction sites should be kept to a minimum. • Construction related noise and dust pollution should be limited. • Gravel roads should be sprayed with water to limit dust creation if economically feasible and reasonable from an environmental perspective (water scarce area) or an appropriate dust suppressant should be used. • Normal working hours (e.g. 7am to 5pm) should be considered. • Permanent security personnel should be on site
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Traffic related, and road surface impacts during the entire Karoshoek Development’s construction phase as well as due to the movement of vehicles associated with other developments in the area.
<p>Residual impacts:</p> <ul style="list-style-type: none"> • None anticipated

Table 8: Impact on daily living and movement patterns: Operational Phase

NATURE: IMPACT ON DAILY LIVING AND MOVEMENT PATTERNS		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Medium (33)	Low (27)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	

Can impacts be mitigated?	Yes
Mitigation: <ul style="list-style-type: none"> • Locals should be employed as far as possible. • Normal working hours (e.g. 6am to 6pm) should be considered. • Employees should understand that excessive noise could be problematic and should thus attend to this issue in a sensitive manner. • The facility should be properly maintained and managed to avoid any form of pollution. • The local access road to the site should be regularly maintained to keep the local road conditions in a good quality state 	
Cumulative impacts: <ul style="list-style-type: none"> • Possible cumulative impact on the social environment due to the proposed Karoshoek Development and other solar facilities planned in the larger Upington area 	
Residual impacts: <ul style="list-style-type: none"> • Visual impact on the natural environment 	

6.6 Impact on sense of place

The visual impact during the construction phase is anticipated to be low and of a temporary nature as it would be associated with the actual construction equipment camp and laydown area where material and equipment would be stored. Fuel for on-site vehicles would also be stored on site. It is furthermore unlikely that the construction site would be clearly visible from the N10 or the surrounding farms.

The site for the proposed Concentrating Photovoltaic facilities or Parabolic dishes and the surrounding area can be described as an undisturbed rural landscape. Even though the study area for the entire Karoshoek Development is traversed by the Garona-Gordonia 132 kV power line to the north east of the site and the Garona-Kleinbegin 132 kV line to the west of the site, it does not interfere with the local landscape characteristics of the farm Karos due to their distance from the farm Karos.

New infrastructure such as Concentrating Photovoltaic facilities or Parabolic dishes would thus have a severe negative impact on the landscape character and aesthetic quality of the area. Even though the viewer incidence of the facility would be limited due to the distance of homesteads, dwellings and the N10 from the site, the proposed facility could still be visible from specific viewpoints. The Karosberg, however, could limit the possible impact to the

farming areas to the east of the farm Karos and the Karos settlement. Lighting (for security purposes) also remains of concern.

Table 9: Impact on sense of place: Construction Phase

NATURE: IMPACT ON SENSE OF PLACE		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Low (4)	Minor (2)
Probability	Improbable (2)	Improbable (2)
Significance	Low (18)	Low (14)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> Storage areas should be fenced off. Soils should be replaced and the construction area, as well as laydown areas should be rehabilitated as soon as possible after construction. The construction site should be kept litter free. Overall site rehabilitation should occur as soon as the construction process allows. The recommendations made by the Visual Impact Assessment should be adhered to 		
Cumulative impacts:		
<ul style="list-style-type: none"> None anticipated 		
Residual impacts:		
<ul style="list-style-type: none"> None anticipated 		

Table 10: Impact on sense of place: Operational Phase

NATURE: IMPACT ON SENSE OF PLACE		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	Medium (52)	Medium (39)
Status (positive or negative)	Negative	Negative
Reversibility	No	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	To a limited extent	
Mitigation:		
<ul style="list-style-type: none"> The design and specific positioning of the facility should aim to minimise the possible negative visual impact of the facility on the surrounding property owners. The lowest possible height for the Concentrating Photovoltaic facilities or Parabolic dishes should be considered. The design of the security buildings should blend in with surrounding environment. Lighting issues should receive the attention it deserves to avoid any light pollution at night. The mitigation measures of the Visual Impact Assessment should be strictly implemented 		
Cumulative impacts:		
<ul style="list-style-type: none"> Cumulative visual impacts on the sense of place of the rural character of the area are associated with the proposed PV facilities and CSP facilities proposed in the Upington area, the DOE Solar Park and the Eskom CSP plant. 		
Residual impacts:		
<ul style="list-style-type: none"> Negative visual intrusion of the landscape 		

7. SITE 1.1: KAROSHOEK LF 1: POTENTIAL SOCIAL IMPACTS

7.1 Background

The Karoshoek Linear Fresnel (LF) 1 entails the establishment of one 100 MW Linear Fresnel on Site 1.1 which is located on Portion 3 of the farm Annashoek 41 and on Portion 0 of the farm Zandemm 944. The proposed site thus spans the border of the two farms. A LF can be described as flat, long segments of glass mirrors to focus sunlight onto a fixed absorber (receiver) located at a common focal point of the reflectors.

The larger site for the Karoshoek Development comprises an area of approximately 34 000 ha, but the development area for Site 1.1 is approximately 500 ha.

7.2 Employment creation, local procurement and economic benefits

During the construction phase a maximum of six hundred (600) employees would be required for the construction of the LF. These employees would consist of low skilled, semi-skilled and skilled individuals. It is highly likely that the semi-skilled and low skilled individuals could be sourced from Upington, Strausburg (Ntsikelelo), Dagbreek, Karos and Leerkrans situated along the N10 in close proximity to the farms Annashoek and Zandemm. These individuals would be employed for some basic construction activities requiring manual labour. As large sectors of the local population have been involved in the agricultural sector it is assumed that they would thus be able to undertake the basic construction activities required with the minimum additional training required. Even though this could be the case, skills training and capacity building remain imperative.

Skilled individuals could be sourced from South Africa or even include some foreigners, as the broad-spectrum profile of the local communities does not include individuals with high levels of education or experience regarding the construction of the LF facility.

At this stage it is anticipated that forty (40) permanent employees would be required during the operational period of the LF facility. Due to the relative limited number of individuals involved it is thus anticipated that the short term employment boost during the construction phase would have a more intense impact on the local communities than the permanent employment opportunities. This benefit, however, could be further enhanced by focused training, capacity building and skills development enabling individuals to be considered for permanent employment. Should this be achieved, the short term employment benefits could be altered to long term sustainable development amongst some individual community members.

As there is a shortage of credible suppliers of the materials and equipment required for the LF facility, local procurement during the construction phase would only be focused on general goods, materials and services such as the hiring of construction vehicles and the transportation of the materials. During the operational life of the facility it is more likely that local services could be procured such as those required for security purposes and the general maintenance of the facility (e.g. repairs, painting of buildings and so forth).

Regional economic benefits of the Karoshoek Development would not only accrue through the creation of an additional stable electricity supply but also through the downstream benefits to the local and regional economy.

Table 11: Employment creation, local procurement and economic benefits: Construction Phase

NATURE: EMPLOYMENT CREATION, LOCAL PROCUREMENT AND ECONOMIC BENEFITS		
	Without enhancement	With enhancement
Extent	Regional (3)	Regional (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Highly probable (4)
Significance	Medium (33) (+)	Medium (44) (+)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be enhanced?	Yes	
Enhancement:		
<ul style="list-style-type: none"> • The local labour content should be maximised as far as possible. • A skills audit should be undertaken to determine the skills available in the local communities and the discrepancy with the requirements of the project. • Training and capacity building of locals are imperative and should also aim to equip locals with sufficient skills to enable them to be employable as permanent employees. Short term construction related employment opportunities could then be changed to long term benefits which could then accrue to the local communities who are in dire need of employment. 		

<ul style="list-style-type: none"> • Skills training should thus be transferable and employment opportunities sustainable. • A broad-based approach should be followed to identify and involve relevant organisations which could assist the main contractor and project proponent in identifying people whose skills may correspond with the job specifications • Employing as many locals as possible would assist in combatting crime in the area. • The project proponent and contractors should create conditions that are conducive for the involvement of entrepreneurs, small businesses, and SMMEs during the construction process. • Tender documentation should contain guidelines for the involvement of labour, entrepreneurs, businesses, and SMMEs from the local sector. • Communication efforts concerning job creation opportunities should refrain from creating unrealistic expectations.
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Cumulative employment opportunities associated with all the components of the Karoshoek Development, and other proposed solar facilities in the Upington area • Should the construction timeframes of the Karoshoek Development overlap with other proposed facilities, a lack of sufficient individuals within the study area with some skills could occur.
<p>Residual impacts:</p> <ul style="list-style-type: none"> • Trained and skilled individuals as a result of the proposed Karoshoek Solar Valley Development as well as the other possible solar facilities proposed in the Upington area.

Table 12: Employment creation, local procurement and economic benefits: Operational Phase

NATURE: EMPLOYMENT CREATION, LOCAL PROCUREMENT AND ECONOMIC BENEFITS		
	Without enhancement	With enhancement
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Moderate (6)
Probability	Improbable (2)	Probable (3)
Significance	Low (22) (+)	Medium (39) (+)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	

Irreplaceable loss of resources?	No
Can impacts be enhanced?	Yes
<p>Enhancement:</p> <ul style="list-style-type: none"> • The developer should capacitate locals where possible to enable them to secure full time employment. Skills development focused on the operational phase should thus start during the construction phase where practically possible. • Where possible, the developer should consider training and capacity building programmes to lessen the skills disparity between the local community and the permanent jobs on offer. • Individual tailor made training programmes for full time employees should be embarked upon in association with accredited training facilities to ensure long term benefits to those involved. • Bursaries to suitable candidates should be considered. • Long term permanent job opportunities should be advertise in a “user friendly” and easily accessible manner. • The project applicant should create conditions that are conducive for the involvement of entrepreneurs, small businesses, and SMME’s during the operational phase for rendering ancillary services to the proposed facility 	
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Cumulative employment opportunities associated with all the components of the Karoshoek Development, and other proposed solar facilities in the Upington area 	
<p>Residual impacts:</p> <ul style="list-style-type: none"> • Improved quality of life for those permanently employed • Improved socio-economic conditions for locals permanently employed • Positive economic-spin offs due to increased buying power and local economic processes 	

7.3 Population change

Population change refers to the inflow of temporary workers and jobseekers during the construction phase, as well as the presence of permanent personnel during the operational phase of the project.

The inflow of six hundred (600) workers to the area would have definite impacts on the local social environment of those living in close proximity to the site as the area is currently scarcely populated and characterized as a peaceful rural environment. The possible negative impacts would refer to the movement of the workers to and from the construction site, possible increased noise on site, safety and security risks, spreading of sexually transmitted

diseases, littering and even social conflict between locals and these workers with regards to employment opportunities or conflict between “outside” workers and locals during after hour social contact.

Safety and security of the locals are always a source of concern when large construction workforces enter an area. It is therefore critically important to ensure that the existing security profile of the communities not be negatively affected through trespassing of properties, housebreaks and theft of goods and livestock. Construction workers should be easily identifiable and should remain at the construction site during working hours.

Some of the construction workers are likely to be sourced from outside the area as the positions available would require specific technical and management skills. Labourers and skilled employees not originally residing in the Upington area, or at the local settlements such as Strausburg (Ntsikelelo), Dagbreek, Karos and Leerkrans would thus be accommodated within the town of Upington. No accommodation facilities would therefore be established on site. The positive economic impact in this regard would thus be focused on the town of Upington where the majority of accommodation facilities are located.

Should the inflow of workers to the area be associated with the inflow of jobseekers, the negative impacts on the social environment can be increased. Due to the proximity of the farms to the Leerkrans and Karos settlements it is quite likely that jobseekers would congregate at the entrance to the site at the N10.

Positive impacts would refer to the local increased buying power and economic spin-offs associated with an increase in the local population size and density during the construction period, although this is anticipated to be felt within the larger urban nodes such as Upington and not necessarily in the study area. The negative impacts as a result of the population change on the social fabric of the locals with possible long term negative consequences thus overshadow the limited possible short-term positive economic impacts on the local farming community and those residing in the smaller settlements.

Forty permanent employees would be involved with the operations of the LF facility. Their presence would have some negative intrusion impacts on the social environment, but if local community members could be employed it could be altered to a positive impact. No additional impact on the provision of services and infrastructure is thus foreseen, although the cumulative impact of the inflow of various individuals to the area as a result of the Karoshoek Development and other solar facilities proposed in the Upington area should be noted.

The short-term and long-term cumulative increase in the local population figures could thus have some financial bearings on the //Khara Hais Municipality if not properly managed.

Table 13: Population change: Construction Phase

NATURE: POPULATION CHANGE		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly Probable (4)	Probable (3)
Significance	Medium (44)	Medium (33)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Locals should be employed as far as possible • Should local accommodation facilities within the study area be available, it should be considered for housing some members of the construction workforce • Construction workers should be transported to and from the site via busses. These vehicles should be in good working order and should adhere to all traffic related regulations • Construction workers should be easily identifiable and should remain at the construction site during working hours • No trespassing of private properties should be allowed • Construction workers should be supervised at all times. • Construction activities should be kept to normal working hours e.g. from 6am until 6 pm during weekdays • Employees should understand that excessive noise could be problematic and should thus attend to this issue in a sensitive manner • Local community representatives, policing forums and those from the //Khara Hais Local Municipality should be informed of the size and presence of the construction workforce • The construction site should be kept litter free and proper sanitation and waste management infrastructure should be implemented 		

<ul style="list-style-type: none"> • HIV/Aids awareness campaigns should be undertaken among the workforce • The construction site should be fenced and managed by permanent security personnel • Accommodation requirements should be communicated to the hospitality industry within Upington, representatives of the //Khara Hais Municipality and the local community forums to ensure adequate facilities are available as required for the entire workforce of the Karoshoek Development • Workers should preferably not be accommodated within the smaller settlements such as Karos and Leerkrans as these settlements would probably require additional or upgrading of existing infrastructure and services to lodge additional individuals. This could then result in undesirable planning and cost implications to the //Khara Hais Municipality.
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Possible need for additional accommodation facilities due to the entire Karoshoek Development and the other developments taking place within the Upington area • Possible additional pressure on services and infrastructure regarding the inflow of people due to the Karoshoek Development and the other planned solar facilities in the Upington area • Increased safety and security risks • Increased health risks
<p>Residual impacts:</p> <ul style="list-style-type: none"> • Long term consequences concerning the provision of services and implementation of infrastructure should construction workers from outside the study area remain in the area without suitable accommodation facilities or permanent employment • Possible permanent increased population size

Table 14: Population change: Operational Phase

NATURE: POPULATION CHANGE		
	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Low (3)
Probability	Probable (3)	Improbable (2)
Significance	Medium (39)	Low (20)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	

Irreplaceable loss of resources?	No
Can impacts be mitigated?	Yes
Mitigation:	
<ul style="list-style-type: none"> • Normal working hours (e.g. 6am to 6pm) should be considered. • Locals should be employed as far as possible. 	
Cumulative impacts:	
<ul style="list-style-type: none"> • The cumulative impact of the inflow of various individuals to the area as a result of the Karoshoek Development and other solar facilities proposed in the Upington area should be noted 	
Residual impacts:	
<ul style="list-style-type: none"> • Possible permanent increased population size 	

7.4 Impact on farming activities

The impact on the farming activities refers to crop production as well as any other type of farming activities undertaken on the affected property and the surrounding properties e.g. cattle, sheep and game farming.

Impacts on the vegetation due to construction activities such as site preparation and clearing would have a definite impact on the agricultural and farming activities undertaken on the property. The increased risk of veld fires, as a result of construction worker conduct and/or activities, also remains of serious concern to the farmers in the area. Other intrusion impacts as a result of construction activities would relate to noise and dust pollution. The farms are currently mainly used for cattle farming. As vegetation would be lost (approximately 500 ha), a negative impact on the grazing capacity of the properties would occur. To limit the negative impacts in this regard it is proposed that the LF facility be fenced to ensure the continuation of cattle farming activities on the remaining section of the property.

High potential farming areas exist along the Gariep River where grapes and raisins are produced. These are situated to the north of the N10 and the farms Annashoek and Zandemm. A small section of the farm Annashoek is also used for the production of raisins (north of the N10). These farms would thus not be directly affected by the proposed LF facility. It is furthermore not anticipated that the construction activities or the proposed facility would have direct negative impacts on the farming activities of the neighbouring property as these would form part of the overall Karoshoek Development. Farming activities on those adjoining farms (east and west) are therefore expected to continue in the areas

outside the development footprint. The distance of the facility to the farms to the south of Annashoek and Zandemm further serves as mitigation measure to ensure that no farming activities to the south would be affected by the proposed development.

Of concern to the farmers in the area is the recruitment of local labourers for the proposed development and the remuneration packages offered. Should the local labourers usually used for the harvesting (January until March) and pruning activities (July to August) be employed as part of the permanent construction team for the entire construction period, it would result in a situation whereby the local farmers would not have sufficient resources available to assist them with their farming practices. Although such a concern could materialise, it should be noted that some local farmers are not only employing local labourers during the pruning and harvesting seasons and are already sourcing labourers or adding to their labour content by recruiting additional individuals from nearby towns or outside the municipal area (e.g. from Kuruman, Kakamas, Keimoes, and so forth). Should there be a shortage of local labourers, it is however anticipated that it could again be mitigated by sourcing temporary labourers from elsewhere to assist the farmers with their farming practices during peak times. As the applicant could further limit this impact by rather employing labourers that are not involved with the grape and raisin farming industry, one cannot restrict those farm workers to apply for employment at the facility.

Another possible impact relates to contesting remuneration packages. Concerns relate to the possibility that the employment opportunities created because of the presence of the facility in the area would lead to a situation that remuneration packages for farm workers would have to be adopted to compete with those packages provided to employees at the facility with subsequent negative financial impacts to the farmers.

From a social perspective, the impacts discussed above could thus occur but is expected to respond to mitigation.

Table 15: Impact on farming activities: Construction Phase

NATURE: IMPACT ON FARMING ACTIVITIES		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Improbable (2)
Significance	Medium (33)	Low (22)
Status (positive or	Negative	Negative

negative)		
Reversibility	Yes	
Irreplaceable loss of resources?	Yes at development footprint	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> Construction activities should not interfere with the farming activities that would continue on the remaining farming sections. Local labourers should be used during the construction phase to limit the inflow of outsiders to the area. Remuneration packages should be market related and should take note of the sensitivities at hand. 		
Cumulative impacts:		
<ul style="list-style-type: none"> Possibility of insufficient numbers of farm workers available for nearby farmers during the peak seasons 		
Residual impacts:		
<ul style="list-style-type: none"> None anticipated 		

Table 16: Impact on farming activities: Operational Phase

NATURE: IMPACT ON FARMING ACTIVITIES		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (39)	Medium (33)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	Yes, but only at footprint of facility	
Can impacts be mitigated?	Yes	

<p>Mitigation:</p> <ul style="list-style-type: none"> • The facility should be fenced to enable the property owner to continue with cattle farming activities if feasible.
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Cumulative loss of farmland as a result of the entire Karoshoek Development and other facilities proposed in the area
<p>Residual impacts:</p> <ul style="list-style-type: none"> • Permanent loss of grazing areas and sterilisation of the land for farming practices due to footprint of facility. • Possible economic losses due to downscaling of farming activities • Possible continuation of farming activities on larger site not affected by the footprint of the facility.

7.5 Impact on daily living and movement patterns

The impacts on the daily living and movement patterns on the local community would mainly refer to the intrusions felt during the construction phase, such as the increase in movement of workers in the area, increase in traffic levels and associated increased risks of accidents, as well as noise and dust pollution. During the operational phase, the impacts on the living and movement patterns of the local communities are not anticipated to be severe.

An increase of people movement could likely increase the possibility of criminal activities in the area such as housebreaks, theft of livestock, crops and materials. To avoid such negative impacts especially during the construction phase, strict safety and security measures should be put in place. It should, however, be noted that the developer and/or contractors cannot be held responsible for worker conduct after working hours.

Movement of construction personnel and construction equipment and material (e.g. graders, cement trucks, trucks, excavators and so forth) would negatively impact on the daily living and movement patterns of residents in the area. The N10 would be the only main access route to be used between Upington and the construction site. The road is not currently under pressure from large volumes of traffic although various heavy vehicles make use of this section of the road, mainly to transport agricultural produce. Additional heavy traffic, however, during the construction period would thus increase the overall risk of accidents (vehicle and pedestrians) on the N10, especially at sharp bends and at the local settlements. Traffic from Upington would pass Leerkrans where school children frequently cross the road and specific safety precautions in this area could thus be required. Additional concerns relate to the possible impact on the road surface as a result of the overall traffic increase during the

entire Karoshoek Development’s construction phase and the anticipated lack of funding from government departments to upgrade and repair damages to the road.

The transportation of some type of equipment during the construction phase, however would require upgrading of the roads e.g. widening on corners to ensure that the road infrastructure can accommodate these abnormal vehicles. This expense, however, would have to be funded by the developer and not the local or provincial government.

An existing access road from the N10 would be used to access the site. The entrance to the site on a bend is of concern with regards to the turning of vehicles into the access road. Possible upgrading of the entrance would be required. No additional access roads are thus envisaged. Internal access roads, however, would have to be constructed to link the various facilities to each other and to the main access road. The usage of the gravel roads would thus result in dust and possible noise pollution during the construction phase and the loss of additional agricultural land.

The area is considered to have low ambient levels. Construction activities, vehicle movement and workers on site would result in intermittent noise pollution. Sensitive receptors, such as homesteads and other type of dwellings located to the south of the N10 and to the north of the farms Annashoek and Zandemm, as well as the Leerkrans and Karos settlements could be negatively affected by the increased noise. It is anticipated that the noise impact would be minimal due to the distance of these receptors to the facility.

The presence of the anticipated forty (40) workers on site during the operational phase and the movement to and from the site would not have any significant impacts on the social environment in the long term, except for the change in the character of the area. This issue is further discussed under Section 7.6.

Table 17: Impact on daily living and movement patterns: Construction Phase

NATURE: IMPACT ON DAILY LIVING AND MOVEMENT PATTERNS		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Moderate (6)	Moderate (4)
Probability	Highly Probable (4)	Probable (3)
Significance	Medium (44)	Low (27)
Status (positive or	Negative	Negative

negative)		
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • The construction site and storage areas should be fenced off to avoid unauthorised entry • Construction vehicles and those transporting materials and goods should be inspected to ensure that these are in good working order and not overloaded. • Construction vehicles should adhere to the speed limits and traffic regulations. • Upgrading of the entrance to the site from the N10 should be investigated and discussed with the relevant road agency or department. • Additional access roads at the construction sites should be kept to a minimum. • Construction related noise and dust pollution should be limited. • Gravel roads should be sprayed with water to limit dust creation if economically feasible and reasonable from an environmental perspective (water scarce area) or an appropriate dust suppressant should be used. • Normal working hours (e.g. 7am to 5pm) should be considered. • Permanent security personnel should be on site 		
Cumulative impacts:		
<ul style="list-style-type: none"> • Traffic related, and road surface impacts during the entire Karoshoek Development's construction phase as well as due to the movement of vehicles associated with other developments in the area. 		
Residual impacts:		
<ul style="list-style-type: none"> • None anticipated 		

Table 18: Impact on daily living and movement patterns: Operational Phase

NATURE: IMPACT ON DAILY LIVING AND MOVEMENT PATTERNS		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Low (4)

Probability	Probable (3)	Probable (3)
Significance	Medium (39)	Medium (33)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> Locals should be employed as far as possible. Normal working hours (e.g. 6am to 6pm) should be considered. Employees should understand that excessive noise could be problematic and should thus attend to this issue in a sensitive manner. The facility should be properly maintained and managed to avoid any form of pollution. The local access road to the site should be regularly maintained to keep the local road conditions in a good quality state 		
Cumulative impacts:		
<ul style="list-style-type: none"> Possible cumulative impact on the social environment due to the proposed Karoshoek Development and other solar facilities planned in the larger Upington area 		
Residual impacts:		
<ul style="list-style-type: none"> Visual impact on the natural environment 		

7.6 Impact on sense of place

The visual impact during the construction phase is anticipated to be low and of a temporary nature as it would be associated with the actual construction equipment camp and laydown area where material and equipment would be stored. Fuel for on-site vehicles would also be stored on site. It is furthermore unlikely that the construction site would be clearly visible from the N10 or the surrounding farms.

The site for the proposed LF facility and the surrounding area can be described as an undisturbed rural landscape. Even though the study area for the entire Karoshoek Development is traversed by the Garona-Gordonia 132 kV power line to the north east of the site and the Garona-Kleinbegin 132 kV line to the west of the site, it does not interfere with

the local landscape characteristics of the farms Annashoek and Zandemm due to their distance from these farms.

New infrastructure such as a LF facility would thus have a severe negative impact on the landscape character and aesthetic quality of the area. The cumulative impacts of sites 1.1, 1.2 (Ilanga facility), 1.3 and 1.4 should also be considered, as the concentration of the infrastructure in this specific area is anticipated to increase the impact on the sense of place. However, it should further be noted that sites 1.1 to 1.4 on the farms Zandemm and Annashoek would be accompanied by other similar infrastructure (Site 2 on the farm Karos, as well as Sites 3, 4 and 5 on the farm Matjesrivier) which would focus and limit the viewer incidence to employees at these sites. Even though the viewer incidence of the facility would be limited due to the distance of homesteads, dwellings and the N10 from the site, the proposed facility could still be visible from specific viewpoints to residents of the study area. Lighting (for security purposes) is also of concern.

Table 19: Impact on sense of place: Construction Phase

NATURE: IMPACT ON SENSE OF PLACE		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Low (4)	Minor (2)
Probability	Improbable (2)	Improbable (2)
Significance	Low (18)	Low (14)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Storage areas should be fenced off. • Soils should be replaced and the construction area, as well as laydown areas should be rehabilitated as soon as possible after construction. • The construction site should be kept litter free. 		

<ul style="list-style-type: none"> Overall site rehabilitation should occur as soon as the construction process allows. The recommendations made by the Visual Impact Assessment should be adhered to
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> None anticipated
<p>Residual impacts:</p> <ul style="list-style-type: none"> None anticipated

Table 20: Impact on sense of place: Operational Phase

NATURE: IMPACT ON SENSE OF PLACE		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	Medium (52)	Medium (39)
Status (positive or negative)	Negative	Negative
Reversibility	No	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	To a limited extent	
<p>Mitigation:</p> <ul style="list-style-type: none"> The design and specific positioning of the facility should aim to minimise the possible negative visual impact of the facility on the surrounding property owners. The design of the security buildings should blend in with surrounding environment. Lighting issues should receive the attention it deserves to avoid any light pollution at night. The mitigation measures of the Visual Impact Assessment should be strictly implemented 		
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> Cumulative visual impacts on the sense of place of the rural character of the area are associated with the proposed PV facilities and CSP facilities proposed in the Upington area, the DOE Solar Park and the Eskom CSP plant. 		
<p>Residual impacts:</p>		

- Negative visual intrusion of the landscape

8. SITE 1.3: KAROSHOEK PT1: POTENTIAL SOCIAL IMPACTS

8.1 Background

The Karoshoek PT entails the establishment of one 100 MW Parabolic Trough on Portion 0 of the farm Zandemm 944.

The larger site for the Karoshoek Development comprises an area of approximately 34 000 ha, but the development area for Site 1.3 is approximately 500 ha.

8.2 Employment creation, local procurement and economic benefits

During the construction phase a maximum of eight hundred (800) employees would be required for the construction of the PT facility. These employees would consist of low skilled, semi-skilled and skilled individuals. It is highly likely that the semi-skilled and low skilled individuals could be sourced from Upington, Straussburg (Ntsikelelo), Dagbreek, Karos and Leerkrans situated along the N10 in close proximity to the farm Zandemm. These individuals would be employed for some basic construction activities requiring manual labour. As large sectors of the local population have been involved in the agricultural sector it is assumed that they would thus be able to undertake the basic construction activities required with the minimum additional training required. Even though this could be the case, skills training and capacity building remain imperative.

Skilled individuals could be sourced from South Africa or even include some foreigners, as the broad-spectrum profile of the local communities does not include individuals with high levels of education or experience regarding the construction of the PT facility.

At this stage it is anticipated that 80 permanent employees would be required during the operational period of the PT facility. Due to the relative limited number of individuals involved it is thus anticipated that the short term employment boost during the construction phase would have a more intense impact on the local communities than the permanent employment opportunities. This benefit, however, could be further enhanced by focused training, capacity building and skills development enabling individuals to be considered for permanent employment. Should this be achieved, the short term employment benefits could be altered to long term sustainable development amongst some individual community members.

As there is a shortage of credible suppliers of the materials and equipment required for the PT facility, local procurement during the construction phase would only be focused on general goods, materials and services such as the hiring of construction vehicles and the transportation of the materials. During the operational life of the facility it is more likely that local services could be procured such as those required for security purposes and the general maintenance of the facility (e.g. repairs, painting of buildings and so forth).

Regional economic benefits of the Karoshoek Development would not only accrue through the creation of an additional stable electricity supply but also through the downstream benefits to the local and regional economy.

Table 21: Employment creation, local procurement and economic benefits: Construction Phase

NATURE: EMPLOYMENT CREATION, LOCAL PROCUREMENT AND ECONOMIC BENEFITS		
	Without enhancement	With enhancement
Extent	Regional (3)	Regional (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Highly probable (4)
Significance	Medium (33) (+)	Medium (44) (+)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be enhanced?	Yes	
Enhancement:		
<ul style="list-style-type: none"> • The local labour content should be maximised as far as possible. • A skills audit should be undertaken to determine the skills available in the local communities and the discrepancy with the requirements of the project. • Training and capacity building of locals are imperative and should also aim to equip locals with sufficient skills to enable them to be employable as permanent employees. Short term construction related employment opportunities could then be changed to long term benefits which could then accrue to the local communities who are in dire need of employment. 		

<ul style="list-style-type: none"> • Skills training should thus be transferable and employment opportunities sustainable. • A broad-based approach should be followed to identify and involve relevant organisations which could assist the main contractor and project proponent in identifying people whose skills may correspond with the job specifications • Employing as many locals as possible would assist in combatting crime in the area. • The project proponent and contractors should create conditions that are conducive for the involvement of entrepreneurs, small businesses, and SMMEs during the construction process. • Tender documentation should contain guidelines for the involvement of labour, entrepreneurs, businesses, and SMMEs from the local sector. • Communication efforts concerning job creation opportunities should refrain from creating unrealistic expectations.
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Cumulative employment opportunities associated with all the components of the Karoshoek Development, and other proposed solar facilities in the Upington area • Should the construction timeframes of the Karoshoek Development overlap with other proposed facilities, a lack of sufficient individuals within the study area with some skills could occur.
<p>Residual impacts:</p> <ul style="list-style-type: none"> • Trained and skilled individuals as a result of the proposed Karoshoek Solar Valley Development as well as the other possible solar facilities proposed in the Upington area.

Table 22: Employment creation, local procurement and economic benefits: Operational Phase

NATURE: EMPLOYMENT CREATION, LOCAL PROCUREMENT AND ECONOMIC BENEFITS		
	Without enhancement	With enhancement
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Improbable (2)	Probable (3)
Significance	Low (26) (+)	Medium (39) (+)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	

<p>Irreplaceable loss of resources?</p>	<p>No</p>
<p>Can impacts be enhanced?</p>	<p>Yes</p>
<p>Enhancement:</p> <ul style="list-style-type: none"> • The developer should capacitate locals where possible to enable them to secure full time employment. Skills development focused on the operational phase should thus start during the construction phase where practically possible. • Where possible, the developer should consider training and capacity building programmes to lessen the skills disparity between the local community and the permanent jobs on offer. • Individual tailor made training programmes for full time employees should be embarked upon in association with accredited training facilities to ensure long term benefits to those involved. • Bursaries to suitable candidates should be considered. • Long term permanent job opportunities should be advertise in a “user friendly” and easily accessible manner. • The project applicant should create conditions that are conducive for the involvement of entrepreneurs, small businesses, and SMME’s during the operational phase for rendering ancillary services to the proposed facility 	
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Cumulative employment opportunities associated with all the components of the Karoshoek Development, and other proposed solar facilities in the Upington area 	
<p>Residual impacts:</p> <ul style="list-style-type: none"> • Improved quality of life for those permanently employed • Improved socio-economic conditions for locals permanently employed • Positive economic-spin offs due to increased buying power and local economic processes 	

8.3 Population change

Population change refers to the inflow of temporary workers and jobseekers during the construction phase, as well as the presence of permanent personnel during the operational phase of the project.

The inflow of eight hundred (800) workers to the area would have definite impacts on the local social environment of those living in close proximity to the site as the area is currently scarcely populated and characterized as a peaceful rural environment. The possible negative impacts would refer to the movement of the workers to and from the construction site, possible increased noise on site, safety and security risks, spreading of sexually transmitted

diseases, littering and even social conflict between locals and these workers with regards to employment opportunities or conflict between “outside” workers and locals during after hour social contact.

Safety and security of the locals are always a source of concern when large construction workforces enter an area. It is therefore critically important to ensure that the existing security profile of the communities not be negatively affected through trespassing of properties, housebreaks and theft of goods and livestock. Construction workers should be easily identifiable and should remain at the construction site during working hours.

Some of the construction workers are likely to be sourced from outside the area as the positions available would require specific technical and management skills. Labourers and skilled employees not originally residing in the Upington area, or at the local settlements such as Strausburg (Ntsikelelo), Dagbreek, Karos and Leerkrans would thus be accommodated within the town of Upington. No accommodation facilities would therefore be established on site. The positive economic impact in this regard would thus be focused on the town of Upington where the majority of accommodation facilities are located.

Should the inflow of workers to the area be associated with the inflow of jobseekers the negative impacts on the social environment can be increased. Due to the proximity of the farm to the Leerkrans and Karos settlements it is quite likely that jobseekers would congregate at the entrance to the site at the N10.

Positive impacts would refer to the local increased buying power and economic spin-offs associated with an increase in the local population size and density during the construction period, although this is anticipated to be felt within the larger urban nodes such as Upington and not necessarily in the study area. The negative impacts as a result of the population change on the social fabric of the locals with possible long term negative consequences thus overshadow the limited possible short-term positive economic impacts on the local farming community and those residing in the smaller settlements.

Eighty (80) permanent employees would be involved with the operations of the PT facility. Their presence would have some negative intrusion impacts on the social environment, but if local community members could be employed it could be altered to a positive impact. No additional impact on the provision of services and infrastructure is thus foreseen, although the cumulative impact of the inflow of various individuals to the area as a result of the Karoshoek Development and other solar facilities proposed in the Upington area should be noted.

The short-term and long-term cumulative increase in the local population figures could thus have some financial bearings on the //Khara Hais Municipality if not properly managed.

Table 23: Population change: Construction Phase

NATURE: POPULATION CHANGE		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly Probable (4)	Probable (3)
Significance	Medium (44)	Medium (33)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Locals should be employed as far as possible • Should local accommodation facilities within the study area be available, it should be considered for housing some members of the construction workforce • Construction workers should be transported to and from the site via busses. These vehicles should be in good working order and should adhere to all traffic related regulations • Construction workers should be easily identifiable and should remain at the construction site during working hours • No trespassing of private properties should be allowed • Construction workers should be supervised at all times. • Construction activities should be kept to normal working hours e.g. from 7 am until 5 pm during weekdays • Employees should understand that excessive noise could be problematic and should thus attend to this issue in a sensitive manner • Local community representatives, policing forums and those from the //Khara Hais Local Municipality should be informed of the size and presence of the construction workforce • The construction site should be kept litter free and proper sanitation and waste management infrastructure should be implemented 		

<ul style="list-style-type: none"> • HIV/Aids awareness campaigns should be undertaken among the workforce • The construction site should be fenced and managed by permanent security personnel • Accommodation requirements should be communicated to the hospitality industry within Upington, representatives of the //Khara Hais Municipality and the local community forums to ensure adequate facilities are available as required for the entire workforce of the Karoshoek Development • Workers should preferably not be accommodated within the smaller settlements such as Karos and Leerkrans as these settlements would probably require additional or upgrading of existing infrastructure and services to lodge additional individuals. This could then result in undesirable planning and cost implications to the //Khara Hais Municipality.
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Possible need for additional accommodation facilities due to the entire Karoshoek Development and the other developments taking place within the Upington area • Possible additional pressure on services and infrastructure regarding the inflow of people due to the Karoshoek Development and the other planned solar facilities in the Upington area • Increased safety and security risks • Increased health risks
<p>Residual impacts:</p> <ul style="list-style-type: none"> • Long term consequences concerning the provision of services and implementation of infrastructure should construction workers from outside the study area remain in the area without suitable accommodation facilities or permanent employment • Possible permanent increased population size

Table 24: Population change: Operational Phase

NATURE: POPULATION CHANGE		
	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly Probable (4)	Probable (3)
Significance	Medium (52)	Medium (39)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	

Irreplaceable loss of resources?	No
Can impacts be mitigated?	Yes
Mitigation: <ul style="list-style-type: none"> • Normal working hours (e.g. 7am to 5pm) should be considered. • Locals should be employed as far as possible. 	
Cumulative impacts: <ul style="list-style-type: none"> • The cumulative impact of the inflow of various individuals to the area as a result of the Karoshoek Development and other solar facilities proposed in the Upington area should be noted 	
Residual impacts: <ul style="list-style-type: none"> • Possible permanent increased population size 	

8.4 Impact on farming activities

The impact on the farming activities refers to crop production as well as any other type of farming activities undertaken on the affected property and the surrounding properties e.g. cattle, sheep and game farming.

Impacts on the vegetation due to construction activities such as site preparation and clearing would have a definite impact on the agricultural and farming activities undertaken on the property. The increased risk of veld fires, as a result of construction worker conduct and/or activities, also remains of serious concern to the farmers in the area. Other intrusion impacts as a result of construction activities would relate to noise and dust pollution. The farm Zandemm is currently used for cattle farming. As vegetation would be lost (approximately 500 ha), a negative impact on the grazing capacity of the properties would occur. To limit the negative impacts in this regard it is proposed that the PT facility be fenced to ensure the continuation of cattle farming activities on the remaining section of the property.

High potential farming areas exist along the Gariep River where grapes and raisins are produced. These are situated to the north of the N10 and the farm Zandemm and would thus not be directly affected by the proposed PT facility. It is furthermore not anticipated that the construction activities or the proposed facility would have direct negative impacts on the farming activities of the neighbouring property to the north of the farm, as these would form part of the overall Karoshoek Development. Farming activities on the farm Karos (to the north of the farm Zandemm) are thus expected to continue in the areas outside the development footprint. Construction activities or the proposed facility would also not have direct negative impacts on the farming activities of the neighbouring property owners to the

southern and southwestern side of the property, except if livestock theft occurs on those properties and if the safety and security of those farmers are compromised due to the influx of workers to the area.

Of concern to the farmers in the area is the recruitment of local labourers for the proposed development and the remuneration packages offered. Should the local labourers usually used for the harvesting (January until March) and pruning activities (July to August) be employed as part of the permanent construction team for the entire construction period, it would result in a situation whereby the local farmers would not have sufficient resources available to assist them with their farming practices. Although such a concern could materialise, it should be noted that some local farmers are not only employing local labourers during the pruning and harvesting seasons and are already sourcing labourers or adding to their labour content by recruiting additional individuals from nearby towns or outside the municipal area (e.g. from Kuruman, Kakamas, Keimoes, and so forth). Should there be a shortage of local labourers, it is however anticipated that it could again be mitigated by sourcing temporary labourers from elsewhere to assist the farmers with their farming practices during peak times. As the applicant could further limit this impact by rather employing labourers that are not involved with the grape and raisin farming industry, one cannot restrict those farm workers to apply for employment at the facility.

Another possible impact relates to contesting remuneration packages. Concerns relate to the possibility that the employment opportunities created because of the presence of the facility in the area would lead to a situation that remuneration packages for farm workers would have to be adopted to compete with those packages provided to employees at the facility with subsequent negative financial impacts to the farmers.

From a social perspective, the impacts discussed above could thus occur but is expected to respond to mitigation.

Table 25: Impact on farming activities: Construction Phase

NATURE: IMPACT ON FARMING ACTIVITIES		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Improbable (2)
Significance	Medium (33)	Low (22)
Status (positive or	Negative	Negative

negative)		
Reversibility	Yes	
Irreplaceable loss of resources?	Yes at development footprint	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> Construction activities should not interfere with the farming activities that would continue on the larger site. Local labourers should be used during the construction phase to limit the inflow of outsiders to the area. Remuneration packages should be market related and should take note of the sensitivities at hand. 		
Cumulative impacts:		
<ul style="list-style-type: none"> Possibility of insufficient numbers of farm workers available for nearby farmers during the peak seasons 		
Residual impacts:		
<ul style="list-style-type: none"> None anticipated 		

Table 26: Impact on farming activities: Operational Phase

NATURE: IMPACT ON FARMING ACTIVITIES		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (39)	Medium (33)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	Yes, but only at footprint of facility	
Can impacts be	Yes	

mitigated?	
Mitigation: <ul style="list-style-type: none"> • The facility should be fenced to enable the property owner to continue with cattle farming activities if feasible. 	
Cumulative impacts: <ul style="list-style-type: none"> • Cumulative loss of farmland as a result of the entire Karoshoek Development and other facilities proposed in the area 	
Residual impacts: <ul style="list-style-type: none"> • Permanent loss of grazing areas and sterilisation of the land for farming practices due to footprint of facility. • Possible economic losses due to downscaling of farming activities • Possible continuation of farming activities on larger site not affected by the footprint of the facility. 	

8.5 Impact on daily living and movement patterns

The impacts on the daily living and movement patterns on the local community would mainly refer to the intrusions felt during the construction phase, such as the increase in movement of workers in the area, increase in traffic levels and associated increased risks of accidents, as well as noise and dust pollution. During the operational phase, the impacts on the living and movement patterns of the local communities are not anticipated to be severe.

An increase of people movement could likely increase the possibility of criminal activities in the area such as housebreaks, theft of livestock, crops and materials. To avoid such negative impacts especially during the construction phase, strict safety and security measures should be put in place. It should, however, be noted that the developer and/or contractors cannot be held responsible for worker conduct after working hours.

Movement of construction personnel and construction equipment and material (e.g. graders, cement trucks, trucks, excavators and so forth) would negatively impact on the daily living and movement patterns of residents in the area. The N10 would be the only main access route to be used between Upington and the construction site. The road is not currently under pressure from large volumes of traffic although various heavy vehicles make use of this section of the road, mainly to transport agricultural produce. Additional heavy traffic, however, during the construction period would thus increase the overall risk of accidents (vehicle and pedestrians) on the N10, especially at sharp bends and at the local settlements. Traffic from Upington would pass Leerkrans where school children frequently cross the road and specific safety precautions in this area could thus be required. Additional concerns relate

to the possible impact on the road surface as a result of the overall traffic increase during the entire Karoshoek Development’s construction phase and the anticipated lack of funding from government departments to upgrade and repair damages to the road.

The transportation of some type of equipment during the construction phase, however would require upgrading of the roads e.g. widening on corners to ensure that the road infrastructure can accommodate these abnormal vehicles. This expense, however, would have to be funded by the developer and not the local or provincial government.

An existing access road from the N10 would be used to access the site. The entrance to the site on a bend is of concern with regards to the turning of vehicles into the access road. Possible upgrading of the entrance would be required. No additional access roads are thus envisaged. Internal access roads, however, would have to be constructed to link the various facilities to each other and to the main access road. The usage of the gravel roads would thus result in dust and possible noise pollution during the construction phase and the loss of additional agricultural land.

The area is considered to have low ambient levels. Construction activities, vehicle movement and workers on site would result in intermittent noise pollution. Sensitive receptors, such as homesteads and other type of dwellings located to the south of the N10 and to the north of the farm Zandemm, as well as the Leerkrans and Karos settlements could be negatively affected by the increased noise. It is anticipated that the noise impact would be minimal due to the distance of these receptors to the facility.

The presence of the anticipated eighty (80) workers on site during the operational phase and the movement to and from the site could be noticed by the property owners, but their presence on site is not expected to have negative impacts on the social environment in the long term.

Table 27: Impact on daily living and movement patterns: Construction Phase

NATURE: IMPACT ON DAILY LIVING AND MOVEMENT PATTERNS		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Moderate (6)	Moderate (4)
Probability	Highly Probable (4)	Probable (3)
Significance	Medium (44)	Low (27)

Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • The construction site and storage areas should be fenced off to avoid unauthorised entry • Construction vehicles and those transporting materials and goods should be inspected to ensure that these are in good working order and not overloaded. • Construction vehicles should adhere to the speed limits and traffic regulations. • Upgrading of the entrance to the site from the N10 should be investigated and discussed with the relevant road agency or department. • Additional access roads at the construction sites should be kept to a minimum. • Construction related noise and dust pollution should be limited. • Gravel roads should be sprayed with water to limit dust creation if economically feasible and reasonable from an environmental perspective (water scarce area) or an appropriate dust suppressant should be used. • Normal working hours (e.g. 7am to 5pm) should be considered. • Permanent security personnel should be on site 		
Cumulative impacts:		
<ul style="list-style-type: none"> • Traffic related, and road surface impacts during the entire Karoshoek Development's construction phase as well as due to the movement of vehicles associated with other developments in the area. 		
Residual impacts:		
<ul style="list-style-type: none"> • None anticipated 		

Table 28: Impact on daily living and movement patterns: Operational Phase

NATURE: IMPACT ON DAILY LIVING AND MOVEMENT PATTERNS		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Long term (4)	Long term (4)

Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (39)	Medium (33)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> Locals should be employed as far as possible. Normal working hours (e.g. 7am to 5pm) should be considered. Employees should understand that excessive noise could be problematic and should thus attend to this issue in a sensitive manner. The facility should be properly maintained and managed to avoid any form of pollution. The local access road to the site should be regularly maintained to keep the local road conditions in a good quality state 		
Cumulative impacts:		
<ul style="list-style-type: none"> Possible cumulative impact on the social environment due to the proposed Karoshoek Development and other solar facilities planned in the larger Upington area 		
Residual impacts:		
<ul style="list-style-type: none"> Visual impact on the natural environment 		

8.6 Impact on sense of place

The visual impact during the construction phase is anticipated to be low and of a temporary nature as it would be associated with the actual construction equipment camp and laydown area where material and equipment would be stored. Fuel for on-site vehicles would also be stored on site. It is furthermore unlikely that the construction site would be clearly visible from the N10 or the surrounding farms.

The site for the proposed PT facility and the surrounding area can be described as an undisturbed rural landscape. Even though the study area for the entire Karoshoek Development is traversed by the Garona-Gordonia 132 kV power line to the north east of the site and the Garona-Kleinbegin 132 kV line to the west of the site, it does not interfere with

the local landscape characteristics of the farm Zandemm due to the distance of these lines from the farm.

New infrastructure such as a PT facility would thus have a severe negative impact on the landscape character and aesthetic quality of the area. The cumulative impacts of sites 1.1, 1.2 (Ilanga facility), 1.3 and 1.4 should also be noted, as the concentration of the infrastructure in this specific area is anticipated to increase the impact on the sense of place. Even though the viewer incidence of the facility would be limited due to the distance of homesteads, dwellings and the N10 from the site, the proposed facility could still be visible from specific viewpoints. The Langberg could limit the visual impact to the east of the farm Zandemm. Lighting (for security purposes) also remains of concern.

Table 29: Impact on sense of place: Construction Phase

NATURE: IMPACT ON SENSE OF PLACE		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Low (4)	Minor (2)
Probability	Improbable (2)	Improbable (2)
Significance	Low (18)	Low (14)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Storage areas should be fenced off. • Soils should be replaced and the construction area, as well as laydown areas should be rehabilitated as soon as possible after construction. • The construction site should be kept litter free. • Overall site rehabilitation should occur as soon as the construction process allows. • The recommendations made by the Visual Impact Assessment should be adhered to 		
Cumulative impacts:		

<ul style="list-style-type: none"> None anticipated
Residual impacts: <ul style="list-style-type: none"> None anticipated

Table 30: Impact on sense of place: Operational Phase

NATURE: IMPACT ON SENSE OF PLACE		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	Medium (52)	Medium (39)
Status (positive or negative)	Negative	Negative
Reversibility	No	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	To a limited extent	
Mitigation: <ul style="list-style-type: none"> The design and specific positioning of the facility should aim to minimise the possible negative visual impact of the facility on the surrounding property owners. The design of the security buildings should blend in with surrounding environment. Lighting issues should receive the attention it deserves to avoid any light pollution at night. The mitigation measures of the Visual Impact Assessment should be strictly implemented 		
Cumulative impacts: <ul style="list-style-type: none"> Cumulative visual impacts on the sense of place of the rural character of the area are associated with the proposed PV facilities and CSP facilities proposed in the Upington area, the DOE Solar Park and the Eskom CSP plant. 		
Residual impacts: <ul style="list-style-type: none"> Negative visual intrusion of the landscape 		

9. SITE 1.4, 3, 4 and 5: KAROSHOEK CSP FACILITY: POTENTIAL SOCIAL IMPACTS

9.1 Background

The Karoshoek CSP facility proposed entails the following:

Site	Project Name and Description	Farm Portion
Site 1.4	Karoshoek LFPT 2 (1 x 100 MW Linear Fresnel <u>or</u> Parabolic Trough)	Portion 3 of the Farm Annashoek 41 and Portion 0 of the Farm Zandemm 944
Site 3	Karoshoek Tower 1 (1 x 50MW Tower)	Portion 2 of the Farm Matjesrivier 41
	Karoshoek Tower 2 (1 x 50MW Tower)	
Site 4	Karoshoek LFPT 1 (1 X 100 MW Linear Fresnel <u>or</u> Parabolic Trough <u>or</u> Tower)	Portion 2 of the Farm Matjesrivier 41
Site 5	Karoshoek LFPT 2 (1 X 100 MW Linear Fresnel <u>or</u> Parabolic Trough <u>or</u> Tower)	Portion 2 of the Farm Matjesrivier 41

The generating capacity of the Karoshoek CSP Facility for sites 1.4, 3, 4 and 5 would be 400 MW in total.

The larger site for the Karoshoek Development comprises an area of approximately 34 000 ha, but the development area for Site 1.4, 3, 4 and 5 is each approximately 500 ha.

The construction timeframe for the CSP Facility is anticipated to be between 24 to 36 months.

9.2 Employment creation, local procurement and economic benefits

During the construction phase a maximum of eight hundred (800) employees would be required for the construction of the CSP facility. These employees would consist of low skilled, semi-skilled and skilled individuals. It is highly likely that the semi-skilled and low skilled individuals could be sourced from Upington, Strausburg (Ntsikelelo), Dagbreek, Karos and Leerkrans situated along the N10 in close proximity to the proposed farms. These individuals would be employed for some basic construction activities requiring manual labour. As large sectors of the local population have been involved in the agricultural sector it is assumed that they would thus be able to undertake the basic construction activities required with the minimum additional training required. Even though this could be the case, skills training and capacity building remain imperative.

Skilled individuals could be sourced from South Africa or even include some foreigners, as the broad-spectrum profile of the local communities does not include individuals with high levels of education or experience regarding the construction of the CSP facility.

At this stage it is anticipated that a maximum of 80 permanent employees would be required during the operational period of the CSP facility. Due to the relative limited number of individuals involved it is thus anticipated that the short term employment boost during the construction phase would have a more intense impact on the local communities than the permanent employment opportunities. This benefit, however, could be further enhanced by focused training, capacity building and skills development enabling individuals to be considered for permanent employment. Should this be achieved, the short term employment benefits could be altered to long term sustainable development amongst some individual community members.

As there is a shortage of credible suppliers of the materials and equipment required for the CSP facility, local procurement during the construction phase would only be focused on general goods, materials and services such as the hiring of construction vehicles and the transportation of the materials. During the operational life of the facility it is more likely that local services could be procured such as those required for security purposes and the general maintenance of the facility (e.g. repairs, painting of buildings and so forth).

Regional economic benefits of the Karoshoek Development would not only accrue through the creation of an additional stable electricity supply but also through the downstream benefits to the local and regional economy.

Table 31: Employment creation, local procurement and economic benefits: Construction Phase

NATURE: EMPLOYMENT CREATION, LOCAL PROCUREMENT AND ECONOMIC BENEFITS		
	Without enhancement	With enhancement
Extent	Regional (3)	Regional (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Highly probable (4)
Significance	Medium (33) (+)	Medium (44) (+)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	

Irreplaceable loss of resources?	No
Can impacts be enhanced?	Yes
<p>Enhancement:</p> <ul style="list-style-type: none"> • The local labour content should be maximised as far as possible. • A skills audit should be undertaken to determine the skills available in the local communities and the discrepancy with the requirements of the project. • Training and capacity building of locals are imperative and should also aim to equip locals with sufficient skills to enable them to be employable as permanent employees. Short term construction related employment opportunities could then be changed to long term benefits which could then accrue to the local communities who are in dire need of employment. • Skills training should thus be transferable and employment opportunities sustainable. • A broad-based approach should be followed to identify and involve relevant organisations which could assist the main contractor and project proponent in identifying people whose skills may correspond with the job specifications • Employing as many locals as possible would assist in combatting crime in the area. • The project proponent and contractors should create conditions that are conducive for the involvement of entrepreneurs, small businesses, and SMMEs during the construction process. • Tender documentation should contain guidelines for the involvement of labour, entrepreneurs, businesses, and SMMEs from the local sector. • Communication efforts concerning job creation opportunities should refrain from creating unrealistic expectations. 	
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Cumulative employment opportunities associated with all the components of the Karoshoek Development, and other proposed solar facilities in the Upington area • Should the construction timeframes of the Karoshoek Development overlap with other proposed facilities, a lack of sufficient individuals within the study area with some skills could occur. 	
<p>Residual impacts:</p> <ul style="list-style-type: none"> • Trained and skilled individuals as a result of the proposed Karoshoek Solar Valley Development as well as the other possible solar facilities proposed in the Upington area. 	

Table 32: Employment creation, local procurement and economic benefits: Operational Phase

NATURE: EMPLOYMENT CREATION, LOCAL PROCUREMENT AND ECONOMIC BENEFITS		
	Without enhancement	With enhancement
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Improbable (2)	Probable (3)
Significance	Low (26) (+)	Medium (39) (+)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be enhanced?	Yes	
Enhancement:		
<ul style="list-style-type: none"> The developer should capacitate locals where possible to enable them to secure full time employment. Skills development focused on the operational phase should thus start during the construction phase where practically possible. Where possible, the developer should consider training and capacity building programmes to lessen the skills disparity between the local community and the permanent jobs on offer. Individual tailor made training programmes for full time employees should be embarked upon in association with accredited training facilities to ensure long term benefits to those involved. Bursaries to suitable candidates should be considered. Long term permanent job opportunities should be advertise in a "user friendly" and easily accessible manner. The project applicant should create conditions that are conducive for the involvement of entrepreneurs, small businesses, and SMME's during the operational phase for rendering ancillary services to the proposed facility 		
Cumulative impacts:		
<ul style="list-style-type: none"> Cumulative employment opportunities associated with all the components of the Karoshoek Development, and other proposed solar facilities in the Upington area 		
Residual impacts:		

- Improved quality of life for those permanently employed
- Improved socio-economic conditions for locals permanently employed
- Positive economic-spin offs due to increased buying power and local economic processes

9.3 Population change

Population change refers to the inflow of temporary workers and jobseekers during the construction phase, as well as the presence of permanent personnel during the operational phase of the project.

The inflow of eight hundred (800) workers to the area would have definite impacts on the local social environment of those living in close proximity to the site as the area is currently scarcely populated and characterized as a peaceful rural environment. The possible negative impacts would refer to the movement of the workers to and from the construction site, possible increased noise on site, safety and security risks, spreading of sexually transmitted diseases, littering and even social conflict between locals and these workers with regards to employment opportunities or conflict between “outside” workers and locals during after hour social contact.

Safety and security of the locals are always a source of concern when large construction workforces enter an area. It is therefore critically important to ensure that the existing security profile of the communities not be negatively affected through trespassing of properties, housebreaks and theft of goods and livestock. Construction workers should be easily identifiable and should remain at the construction site during working hours.

Some of the construction workers are likely to be sourced from outside the area as the positions available would require specific technical and management skills. Labourers and skilled employees not originally residing in the Upington area, or at the local settlements such as Strausburg (Ntsikelelo), Dagbreek, Karos and Leerkrans would thus be accommodated within the town of Upington. No accommodation facilities would therefore be established on site. The positive economic impact in this regard would thus be focused on the town of Upington where the majority of accommodation facilities are located.

Should the inflow of workers to the area be associated with the inflow of jobseekers the negative impacts on the social environment can be increased. Due to the proximity of the sites on the farms Annashoek 41, Zandemm 944 and Matjesrivier 41 to the N10 and settlements such as Leerkrans and Karos it is more likely that jobseekers would congregate at the entrance to the site at the N10 and not at the actual construction sites.

Positive impacts would refer to the local increased buying power and economic spin-offs associated with an increase in the local population size and density during the construction period, although this is anticipated to be felt within the larger urban nodes such as Upington and not necessarily in the study area. The negative impacts as a result of the population change on the social fabric of the locals with possible long term negative consequences thus overshadow the limited possible short-term positive economic impacts on the local farming community and those residing in the smaller settlements.

Eighty permanent employees would be involved with the operations of the CSP facility. Their presence would have some negative intrusion impacts on the social environment, but if local community members could be employed it could be altered to a positive impact. No additional impact on the provision of services and infrastructure is thus foreseen, although the cumulative impact of the inflow of various individuals to the area as a result of the Karoshoek Development and other solar facilities proposed in the Upington area should be noted.

The short-term and long-term cumulative increase in the local population figures could thus have some financial bearings on the //Khara Hais Municipality if not properly managed.

Table 33: Population change: Construction Phase

NATURE: POPULATION CHANGE		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly Probable (4)	Probable (3)
Significance	Medium (44)	Medium (33)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Locals should be employed as far as possible • Should local accommodation facilities within the study area be available, it should be considered 		

for housing some members of the construction workforce

- Construction workers should be transported to and from the site via busses. These vehicles should be in good working order and should adhere to all traffic related regulations
- Construction workers should be easily identifiable and should remain at the construction site during working hours
- No trespassing of private properties should be allowed
- Construction workers should be supervised at all times.
- Construction activities should be kept to normal working hours e.g. from 7 am until 5 pm during weekdays
- Employees should understand that excessive noise could be problematic and should thus attend to this issue in a sensitive manner
- Local community representatives, policing forums and those from the //Khara Hais Local Municipality should be informed of the size and presence of the construction workforce
- The construction site should be kept litter free and proper sanitation and waste management infrastructure should be implemented
- HIV/Aids awareness campaigns should be undertaken among the workforce
- The construction site should be fenced and managed by permanent security personnel
- Accommodation requirements should be communicated to the hospitality industry within Upington, representatives of the //Khara Hais Municipality and the local community forums to ensure adequate facilities are available as required for the entire workforce of the Karoshoek Development
- Workers should preferably not be accommodated within the smaller settlements such as Karos and Leerkrans as these settlements would probably require additional or upgrading of existing infrastructure and services to lodge additional individuals. This could then result in undesirable planning and cost implications to the //Khara Hais Municipality.

Cumulative impacts:

- Possible need for additional accommodation facilities due to the entire Karoshoek Development and the other developments taking place within the Upington area
- Possible additional pressure on services and infrastructure regarding the inflow of people due to the Karoshoek Development and the other planned solar facilities in the Upington area
- Increased safety and security risks
- Increased health risks

Residual impacts:

- Long term consequences concerning the provision of services and implementation of infrastructure should construction workers from outside the study area remain in the area

<p>without suitable accommodation facilities or permanent employment</p> <ul style="list-style-type: none"> • Possible permanent increased population size

Table 34: Population change: Operational Phase

NATURE: POPULATION CHANGE		
	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly Probable (4)	Probable (3)
Significance	Medium (52)	Medium (39)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Normal working hours (e.g. 7am to 5pm) should be considered. • Locals should be employed as far as possible. 		
Cumulative impacts:		
<ul style="list-style-type: none"> • The cumulative impact of the inflow of various individuals to the area as a result of the Karoshoek Development and other solar facilities proposed in the Uppington area should be noted 		
Residual impacts:		
<ul style="list-style-type: none"> • Possible permanent increased population size 		

9.4 Impact on farming activities

The impact on the farming activities refers to crop production as well as any other type of farming activities undertaken on the affected property and the surrounding properties e.g. cattle, sheep and game farming.

Impacts on the vegetation due to construction activities such as site preparation and clearing would have a definite impact on the agricultural and farming activities undertaken on the property. The increased risk of veld fires, as a result of construction worker conduct and/or activities, also remains of serious concern to the farmers in the area. Other intrusion impacts as a result of construction activities would relate to noise and dust pollution. Portion 2 and RE of the farm Matjesrivier, as well as the farms Zandemm and Annashoek are currently used for cattle farming. As vegetation would be lost (approximately 500 ha), a negative impact on the grazing capacity of the properties would occur. To limit the negative impacts in this regard it is proposed that the different components of the CSP facility such as the LFT, towers and LFTT be fenced to ensure the continuation of farming activities on the remaining sections of the properties.

High potential farming areas exist along the Gariep River where grapes and raisins are produced. These are situated to the north of the N10 and the proposed farms and would thus not be directly affected by the proposed CSP facility due to the distance from the various sites proposed on these farms. Construction activities of the proposed LFTT facility on Site 5 could however have indirect negative impacts on the farming activities of the neighbouring property to the south of Portion 2 of the farm Matjesrivier, as Site 5 is close to the border of this farm. This would mainly refer to noise and dust. It is therefore anticipated that these temporary negative impacts could be mitigated to ensure that farming activities on the farm Trooilapspan could continue uninterrupted. Theft of livestock on those properties to the south and west of the farm Matjesrivier remains a concern and if the safety and security of those farmers are compromised due to the influx of workers to the area, it would result in severe negative social impacts.

Of concern to the farmers in the area is the recruitment of local labourers for the proposed development and the remuneration packages offered. Should the local labourers usually used for the harvesting (January until March) and pruning activities (July to August) be employed as part of the permanent construction team for the entire construction period, it would result in a situation whereby the local farmers would not have sufficient resources available to assist them with their farming practices. Although such a concern could materialise, it should be noted that some local farmers are not only employing local labourers during the pruning and harvesting seasons and are already sourcing labourers or adding to their labour content by recruiting additional individuals from nearby towns or outside the municipal area (e.g. from Kuruman, Kakamas, Keimoes, and so forth). Should there be a shortage of local labourers, it is however anticipated that it could again be mitigated by sourcing temporary labourers from elsewhere to assist the farmers with their farming practices during peak times. As the applicant could further limit this impact by rather employing labourers that are not involved

with the grape and raisin farming industry, one cannot restrict those farm workers to apply for employment at the facility.

Another possible impact relates to contesting remuneration packages. Concerns relate to the possibility that the employment opportunities created because of the presence of the facility in the area would lead to a situation that remuneration packages for farm workers would have to be adopted to compete with those packages provided to employees at the facility with subsequent negative financial impacts to the farmers.

From a social perspective, the impacts discussed above could thus occur but is expected to respond to mitigation.

Table 35: Impact on farming activities: Construction Phase

NATURE: IMPACT ON FARMING ACTIVITIES		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Improbable (2)
Significance	Medium (33)	Low (22)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	Yes at development footprint	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> Construction activities should not interfere with the farming activities that would continue on the remaining farming sections. Local labourers should be used during the construction phase to limit the inflow of outsiders to the area. Remuneration packages should be market related and should take note of the sensitivities at hand. 		
Cumulative impacts:		
<ul style="list-style-type: none"> Possibility of insufficient numbers of farm workers available for nearby farmers during the peak seasons 		

<p>Residual impacts:</p> <ul style="list-style-type: none"> None anticipated
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Table 36: Impact on farming activities: Operational Phase

NATURE: IMPACT ON FARMING ACTIVITIES		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (39)	Medium (33)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	Yes, but only at footprint of facility	
Can impacts be mitigated?	Yes	
<p>Mitigation:</p> <ul style="list-style-type: none"> The facility should be fenced to enable the property owners to continue with cattle farming activities if feasible. 		
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> Cumulative loss of farmland as a result of the entire Karoshoek Development and other facilities proposed in the area 		
<p>Residual impacts:</p> <ul style="list-style-type: none"> Permanent loss of grazing areas and sterilisation of the land for farming practices due to footprint of facility. Possible economic losses due to downscaling of farming activities Possible continuation of farming activities on larger site not affected by the footprint of the facility. 		

9.5 Impact on daily living and movement patterns

The impacts on the daily living and movement patterns on the local community would mainly refer to the intrusions felt during the construction phase, such as the increase in movement of workers in the area, increase in traffic levels and associated increased risks of accidents, as well as noise and dust pollution. During the operational phase, the impacts on the living and movement patterns of the local communities are not anticipated to be severe.

An increase of people movement could likely increase the possibility of criminal activities in the area such as housebreaks, theft of livestock, crops and materials. To avoid such negative impacts especially during the construction phase, strict safety and security measures should be put in place. It should, however, be noted that the developer and/or contractors cannot be held responsible for worker conduct after working hours.

Movement of construction personnel and construction equipment and material (e.g. graders, cement trucks, trucks, excavators and so forth) would negatively impact on the daily living and movement patterns of residents in the area. The N10 would be the only main access route to be used between Upington and the construction site. The road is not currently under pressure from large volumes of traffic although various heavy vehicles make use of this section of the road, mainly to transport agricultural produce. Additional heavy traffic, however, during the construction period would thus increase the overall risk of accidents (vehicle and pedestrians) on the N10, especially at sharp bends and at the local settlements. Additional concerns relate to the possible impact on the road surface as a result of the overall traffic increase during the entire Karoshoek Development's construction phase and the anticipated lack of funding from government departments to upgrade and repair damages to the road.

The transportation of some type of equipment during the construction phase, however would require upgrading of the roads e.g. widening on corners to ensure that the road infrastructure can accommodate these abnormal vehicles. This expense, however, would have to be funded by the developer and not the local or provincial government.

It is possible to use an existing access road from the N10 through the farm Karos to access site 1.4 on the farms Annashoek and Karos, but an additional access road from the N10 on the farm Matjesrivier to Sites 3, 4 and 5 could also be used as alternative. The entrance to the farm Karos is situated on a bend and thus of concern with regards to the turning of vehicles into the access road. Possible upgrading of the entrance would be required. No additional access roads are thus envisaged. Internal access roads, however, would have to be constructed to link the various facilities to each other and to the main access road. The

usage of the gravel roads would thus result in dust and possible noise pollution during the construction phase and the loss of additional agricultural land.

The area is considered to have low ambient levels. Construction activities, vehicle movement and workers on site would result in intermittent noise pollution. Sensitive receptors (if any), such as homesteads and other type of dwellings located to the west and south of the farm Matjesrivier 41 could be negatively affected by the increased noise. It is anticipated that the noise impact would, in this case, be minimal.

The presence of the anticipated 80 workers on site during the operational phase and the movement to and from the site could be noticed by the property owners, but their presence on site is not expected to have negative impacts on the social environment in the long term.

Table 37: Impact on daily living and movement patterns: Construction Phase

NATURE: IMPACT ON DAILY LIVING AND MOVEMENT PATTERNS		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Moderate (6)	Moderate (4)
Probability	Highly Probable (4)	Probable (3)
Significance	Medium (44)	Low (27)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • The construction site and storage areas should be fenced off to avoid unauthorised entry • Construction vehicles and those transporting materials and goods should be inspected to ensure that these are in good working order and not overloaded. • Construction vehicles should adhere to the speed limits and traffic regulations. • Upgrading of the entrance to the site from the N10 should be investigated and discussed with the relevant road agency or department. 		

<ul style="list-style-type: none"> • Additional access roads at the construction sites should be kept to a minimum. • Construction related noise and dust pollution should be limited. • Gravel roads should be sprayed with water to limit dust creation if economically feasible and reasonable from an environmental perspective (water scarce area) or an appropriate dust suppressant should be used. • Normal working hours (e.g. 7am to 5pm) should be considered. • Permanent security personnel should be on site
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Traffic related, and road surface impacts during the entire Karoshoek Development’s construction phase as well as due to the movement of vehicles associated with other developments in the area.
<p>Residual impacts:</p> <ul style="list-style-type: none"> • None anticipated

Table 38: Impact on daily living and movement patterns: Operational Phase

NATURE: IMPACT ON DAILY LIVING AND MOVEMENT PATTERNS		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (39)	Medium (33)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
<p>Mitigation:</p> <ul style="list-style-type: none"> • Locals should be employed as far as possible. • Normal working hours (e.g. 7am to 5pm) should be considered. 		

<ul style="list-style-type: none"> • Employees should understand that excessive noise could be problematic and should thus attend to this issue in a sensitive manner. • The facility should be properly maintained and managed to avoid any form of pollution. • The local access road to the site should be regularly maintained to keep the local road conditions in a good quality state
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Possible cumulative impact on the social environment due to the proposed Karoshoek Development and other solar facilities planned in the larger Upington area
<p>Residual impacts:</p> <ul style="list-style-type: none"> • Visual impact on the natural environment

9.6 Impact on sense of place

The visual impact during the construction phase is anticipated to be low and of a temporary nature as it would be associated with the actual construction equipment camp and laydown area where material and equipment would be stored. Fuel for on-site vehicles would also be stored on site. It is furthermore unlikely that the construction site would be clearly visible from the N10 or the surrounding farms.

The sites proposed for the different components of the CSP facility and the surrounding area can be described as an undisturbed rural landscape. Even though the study area for the entire Karoshoek Development is traversed by the Garona-Gordonia 132 kV power line to the north east of the site and the Garona-Kleinbegin 132 kV line to the west of the site, it does not interfere with the local landscape characteristics due to the distance of these lines from the farms.

New infrastructure such as the components of the CSP facility would thus have a severe negative impact on the landscape character and aesthetic quality of the area. The tower is anticipated to be 100 m high which is anticipated to be quite visible from long distances. The cumulative impacts of sites 3, 4 and 5 on the farm Matjesrivier with the different types of infrastructure should also be noted, as the concentration of the infrastructure on this farm is anticipated to have different disturbing impacts (e.g. difference in shape, heights and so forth) on the landscape and could thus increase the impact on the sense of place. Even though the viewer incidence of the components would be limited due to the distance of homesteads and dwellings from the sites, as well as the Groblershoop gravel road to the east of the farm Matjesrivier and the N10, the proposed facilities could still be visible from specific viewpoints. Lighting (for security purposes) is also of concern.

Table 39: Impact on sense of place: Construction Phase

NATURE: IMPACT ON SENSE OF PLACE		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Low (4)	Minor (2)
Probability	Improbable (2)	Improbable (2)
Significance	Low (18)	Low (14)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> Storage areas should be fenced off. Soils should be replaced and the construction area, as well as laydown areas should be rehabilitated as soon as possible after construction. The construction site should be kept litter free. Overall site rehabilitation should occur as soon as the construction process allows. The recommendations made by the Visual Impact Assessment should be adhered to 		
Cumulative impacts:		
<ul style="list-style-type: none"> None anticipated 		
Residual impacts:		
<ul style="list-style-type: none"> None anticipated 		

Table 40: Impact on sense of place: Operational Phase

NATURE: IMPACT ON SENSE OF PLACE		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Long term (4)	Long term (4)

Magnitude	Moderate (6)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	Medium (52)	Medium (39)
Status (positive or negative)	Negative	Negative
Reversibility	No	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	To a limited extent	
Mitigation:		
<ul style="list-style-type: none"> • The design and specific positioning of the facility should aim to minimise the possible negative visual impact of the facility on the surrounding property owners. • The design of the security buildings should blend in with surrounding environment. • Lighting issues should receive the attention it deserves to avoid any light pollution at night. • The mitigation measures of the Visual Impact Assessment should be strictly implemented 		
Cumulative impacts:		
<ul style="list-style-type: none"> • Cumulative visual impacts on the sense of place of the rural character of the area are associated with the proposed PV facilities and CSP facilities proposed in the Upington area, the DOE Solar Park and the Eskom CSP plant. 		
Residual impacts:		
<ul style="list-style-type: none"> • Negative visual intrusion of the landscape 		

10. GRID CONNECTION: POTENTIAL SOCIAL IMPACTS

10.1 Background

The Karoshoek Development would have to be incorporated into the existing electricity grid. At this stage it is envisaged that the electricity generation infrastructure would include an on-site substation / switchyard on the farm Annashoek 41. A new power line would connect the on-site substation to the Upington CSP Main Transmission Substation or the Niewenhoop Substation. The latter is planned to be constructed in 2016 on Eskom's solar facility site which is situated north west of the proposed Karoshoek Development on the farm Olyfenhouts Drift. This line of approximately 30 km is anticipated to be constructed as a 400 kV power line but would at first be operated as a 132 kV line.

10.2 Employment creation, local procurement and economic benefits

Construction of the proposed power line and substation would be undertaken by Eskom contractors and will probably not create large scale job opportunities. For the construction of the proposed power line and substation skilled workers, semi-skilled workers and some unskilled labourers would be involved. The type of jobs required could include project and construction managers, contract supervisors, construction foremen and general labourers (skilled and semi-skilled).

Opportunities for local labour are thus definitely possible, although limited. Due to the social character of the population within the study area and the limited number of jobs available in the agricultural sector, any possible job opportunities for locals should still be viewed as a social benefit. The limited number of job opportunities (even temporary) could still have some positive economic impact on select families.

It is not expected that there would be an influx of jobseekers at the various construction sites along the length of the proposed line, but it is possible that some jobseekers could gather at the entrance of the Karoshoek Development's construction site at the N10 as part of the overall influx of jobseekers looking for work at any of the components of the development.

The proposed project could further assist with capacity building through on-site training and skills development opportunities.

During the operational phase of a power line, limited and intermittent job opportunities exist for local SMMEs or local labourers to source temporary employment e.g. inspections of the lines and servitudes, the clearing of the servitude and general maintenance activities. Local individuals should thus be appointed to undertake the maintenance and related work, if this is practicable and feasible.

Table 41: Employment creation, local procurement and economic benefits: Construction Phase

NATURE: EMPLOYMENT CREATION, LOCAL PROCUREMENT AND ECONOMIC BENEFITS		
	Without enhancement	With enhancement
Extent	Local (2)	Local (2)
Duration	Short duration (2)	Short duration (2)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Highly probable (4)
Significance	Low (24) (+)	Medium (32) (+)

Status (positive or negative)	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be enhanced?	Yes	
Enhancement:		
<ul style="list-style-type: none"> It is recommended that the contractor employ local semi-skilled and unskilled labour from the study area. Eskom should stipulate in their contracts with the contractors that local labour should be used for e.g. bush clearing, road construction and fencing. Ward councillors could assist in determining available local labourers that could be considered for possible employment. 		
Cumulative impacts:		
<ul style="list-style-type: none"> Additional employment creation as part of the Karoshoek Development. 		
Residual impacts:		
<ul style="list-style-type: none"> Training and skills development among local community members involved in the construction process. 		

Table 42: Employment creation, local procurement and economic benefits: Operational Phase

NATURE: EMPLOYMENT CREATION, LOCAL PROCUREMENT AND ECONOMIC BENEFITS		
	Without enhancement	With enhancement
Extent	Local (2)	Local (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Low (4)
Probability	Improbable (2)	Probable (3)
Significance	Low (20) (+)	Medium (30) (+)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	No	

Can impacts be enhanced?	Yes
Enhancement:	
<ul style="list-style-type: none"> Local contractors should be considered for maintenance work if practical and feasible. 	
Cumulative impacts:	
<ul style="list-style-type: none"> Additional employment creation as part of the Karoshoek Development 	
Residual impacts:	
<ul style="list-style-type: none"> None anticipated 	

10.3 Population change

Population change refers to the inflow of temporary workers and jobseekers during the construction phase, as well as the presence of permanent personnel during the operational phase of the project.

During the construction period various teams are usually deployed along the length of the line working at different points along the line undertaking different activities at each point. They would be responsible for the clearance of servitude to facilitate access, excavation of the foundations, concrete works, erection of steel and associated structures, stringing of power line cables, and rehabilitation. Movement during the construction phase would entail the movement of the workforce, equipment, construction vehicles and materials. The impacts associated with the construction phase on the population is thus of a short duration and temporary in nature. As indicated, the number of individuals involved with the construction and operation phase of the proposed power line would be so limited that it is anticipated that it would have minor impacts on the social environment.

Table 43: Population change: Construction Phase

NATURE: POPULATION CHANGE		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Minor (2)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	Low (21)	Low (14)
Status (positive or negative)	Negative	Negative

Reversibility	Yes
Irreplaceable loss of resources?	No
Can impacts be mitigated?	Yes
Mitigation:	
<ul style="list-style-type: none"> Workers should wear identity tags and uniforms to be easily identifiable. Property owners should be notified (preferably in writing) in advance when and what type of construction activities would take place on their properties Workers and contractors should undergo induction training which should include the issue of general good conduct and environmentally sustainable construction practices. Workers and contractors on site should be monitored to ensure that no littering and/or environmental pollution or degradation occurs. 	
Cumulative impacts:	
<ul style="list-style-type: none"> None anticipated 	
Residual impacts:	
<ul style="list-style-type: none"> None anticipated 	

Table 44: Population change: Operational Phase

NATURE: POPULATION CHANGE		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Minor (2)
Probability	Improbable (2)	Very improbable (1)
Significance	Low (18)	Low (9)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		

<ul style="list-style-type: none"> Property owners should be notified in advance regarding the extent and timeframe anticipated for maintenance activities on the power line on their properties.
Cumulative impacts: <ul style="list-style-type: none"> None anticipated
Residual impacts: <ul style="list-style-type: none"> None anticipated

10.4 Impact on farming activities

The impact on the farming activities refers to crop production as well as any other type of farming activities undertaken on the affected property and the surrounding properties e.g. cattle, sheep and game farming.

The farms Zandemm, Annashoek, Matjesrivier and Vaalkoppies are used for livestock farming. The movement of workers on the properties would have an impact on the farming activities if the construction vehicles do not keep to the access roads and in cases where livestock theft occurs. Unauthorised movement with vehicles through the veld would damage the natural vegetation and stock losses would result in negative financial complications for the property owners involved. As the farming activities on the farms Zandemm, Annashoek and Matjesrivier would also be impacted on by the construction activities and development of the various components of the Karoshoek Development, the impact on the farming activities on Portion 4, 6 and 62 of the farm Vaalkoppies is anticipated to be more intense.

Land used for farming activities would be lost due to the substation footprint. The substation site proposed on the farm Annashoek is relatively small in comparison to the size of the farms and the additional footprint areas required for the different components of the Karoshoek Development.

The proposed power line would have a limited impact on stock farming activities as animals can still graze underneath the proposed line and within the servitude. Furthermore, limited grazing land is lost to the tower footprints

Table 45: Impact on farming activities: Construction Phase

NATURE: IMPACT ON FARMING ACTIVITIES		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Moderate (6)	Low (4)

Probability	Probable (3)	Probable (3)
Significance	Medium (33)	Low (27)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	Yes at development footprint	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> Where possible, livestock should be moved away from the construction activities and/or be fenced off for the duration of construction activities in a specific area, especially on the farm Vaalkoppies Eskom should discuss the construction schedule and activities with the affected farmers to enable them to plan their farming activities and animal movement accordingly Conditions and/or specific requests relating to construction activity raised by property owners should be included in the EMP document Contractors should make sure that no materials are left on the properties after construction activities have been completed Additional access roads should be limited Construction vehicles should keep to the access roads allocated for the construction activities 		
Cumulative impacts:		
<ul style="list-style-type: none"> Possible negative economic impacts for farm owners 		
Residual impacts:		
<ul style="list-style-type: none"> None anticipated 		

Table 46: Impact on farming activities: Operational Phase

NATURE: IMPACT ON FARMING ACTIVITIES		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Minor (2)

Probability	Probable (3)	Improbable (2)
Significance	Medium (33)	Low (18)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	Yes, but only at footprint of facility	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Sensitivities with regards to the farming practices should be considered when finalising a line alignment. • The alignments should not negatively impact on income generating activities undertaken on the farms. 		
Cumulative impacts:		
<ul style="list-style-type: none"> • Cumulative loss of farmland as a result of the entire Karoshoek Development and other facilities proposed in the area 		
Residual impacts:		
<ul style="list-style-type: none"> • Permanent loss of grazing areas and sterilisation of the land for farming practices due to footprint of towers and substation area. 		

10.5 Impact on daily living and movement patterns

The construction timeframe for the power line would be of a relative short duration. This process will include site preparations, vegetation clearance (where required), excavations for tower foundations, assembly and erection of the towers, and stringing of the line. Heavy construction vehicles would be used to transport material to the construction sites, but due to the limited number of these, the negative impacts on the residents' daily living and movement patterns are expected to be of a low magnitude. In this regard, it is expected that the transportation would take place on the N10, then making use of the access roads of the Karoshoek Development to the proposed construction sites along the line. Additional access roads could thus be required, especially on the affected portions of the farm Vaalkoppies, which would sterilise land for agricultural activities, but would also result in some additional dust pollution when construction vehicles travel on these roads.

Impacts on daily living and movement patterns also refer to the increased noise pollution during construction activities, especially where construction would take place in close

proximity to dwellings and in the low ambient rural area. Noise will however only be temporary generated and if construction activities adhere to all relevant legislation in this regard and limit construction activities to normal working hours, the impact is anticipated to be minimal.

Safety and security concerns due to the movement of workers on private properties should be attended to through proper communication and conduct. Safety and security impacts include construction related risks and accidents, vehicular accidents, the perceived increase in crime as a result of outsiders being in the area and the possible increased risks of veld fires. It is anticipated that these types of concerns would be evident, due to the presence of other larger construction teams undertaking construction activities for the Karoshoek Development in the greater study area.

Property values could be negatively affected if the proposed power line impacts on the resource use resulting in cumulative negative financial impacts. Property owners do not welcome power lines on their properties due to the perception that power lines would definitely negatively affect their property's value. The devaluation is usually attributed to the possible impact on the resource use, negative visual impact on the property which is perceived to limit the possibility of the property's future development potential, as well as due to the environmental concerns. Eskom compensates property owners based on market value and it is thus not expected that the property owners would suffer financial losses due to the construction of the power lines itself.

Maintenance related impacts would be of a short duration and would occur infrequently. Should workers not use designated access roads, leave gates open, litter, poach game and small livestock, it could have negative social consequences and result in a marked influence on the property owners. In addition, improper maintenance of access roads could easily lead to erosion. Mitigation measures should thus be strictly implemented and good conduct on private properties should be maintained.

Table 47: Impact on daily living and movement patterns: Construction Phase

NATURE: IMPACT ON DAILY LIVING AND MOVEMENT PATTERNS		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Moderate (6)	Moderate (4)
Probability	Highly Probable (4)	Probable (3)
Significance	Medium (44)	Low (27)

Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Additional access routes should be limited and where possible existing gravel roads should be used to reach the construction sites. • Construction vehicles and those transporting materials and goods should be inspected to ensure that these are in good working order and not overloaded. • Construction vehicles should adhere to the speed limits and traffic regulations. • Construction related noise and dust pollution should be limited. • Gravel roads should be sprayed with water to limit dust creation if economically feasible and reasonable from an environmental perspective (water scarce area) or an appropriate dust suppressant should be used. • Normal working hours (e.g. 7am to 5pm) should be considered. • Property owners that would be affected by the transmission line construction should be consulted prior to the construction phase with regards to the construction schedules, transportation corridors, construction of additional access roads and construction methods to be used 		
Cumulative impacts:		
<ul style="list-style-type: none"> • Traffic related, and road surface impacts during the entire Karoshoek Development's construction phase as well as due to the movement of vehicles associated with other developments in the area. 		
Residual impacts:		
<ul style="list-style-type: none"> • None anticipated 		

Table 48: Impact on daily living and movement patterns: Operational Phase

NATURE: IMPACT ON DAILY LIVING AND MOVEMENT PATTERNS		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Low (4)

Probability	Probable (3)	Probable (3)
Significance	Medium (39)	Medium (33)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> Property owners should be notified of the maintenance activities to be undertaken on their properties Speeding on the local roads should be avoided for safety reasons and to limit dust creation. The local access roads should be regularly maintained to keep the local road conditions in a good quality state 		
Cumulative impacts:		
<ul style="list-style-type: none"> None anticipated 		
Residual impacts:		
<ul style="list-style-type: none"> Possible negative economic implications for property owners affected by the proposed power line 		

10.6 Impact on sense of place

The visual impact during the construction phase is anticipated to be low and temporary as it would be associated with the movement of the construction team, vehicles and possible laydown areas along the route. This impact is thus of a low significance and of a short duration.

A power line is usually regarded as intrusive as it changes the visual environment especially in an undisturbed rural landscape. The intrusion would then extend to result in an impact on the sense of place thereby influencing the residents' perception of their environment and possibly impact on the daily living and movement patterns of residents. The social impact in this regard would thus be more severe in areas where the line is unable to easily blend in with the surrounding environment or where the power line would be erected in close proximity to dwellings and homesteads (if any).

The study area is not densely populated and the permanent visual impact would thus be limited to a small minority of property owners who would not necessarily associate the power

line with positive impacts and development. The number of receptors could be increased by employees of the various components of the Karoshoek Development who might again associate the power line with an integral part of the generation of electricity and thus development. Irrespective of the perception of the viewers, it can be concluded that the power line would be visible to various individuals and the cumulative impact of the line and the various components of the facility add to the severe negative impact on the sense of place.

From a social perspective it is concluded that the impact of the power line and the associated infrastructure on the visual aesthetics of the study area cannot be mitigated during the operational phase, but only once the lifespan of the power line and the infrastructure have expired (decommissioning).

Table 49: Impact on sense of place: Construction Phase

NATURE: IMPACT ON SENSE OF PLACE		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short duration (2)	Short duration (2)
Magnitude	Low (4)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Low (27)	Low (21)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Soils should be replaced and the construction area, as well as laydown areas should be rehabilitated as soon as possible after construction. • The construction sites should be kept litter free. • Overall site rehabilitation should occur as soon as the construction process allows. • The recommendations made by the Visual Impact Assessment should be adhered to 		
Cumulative impacts:		

<ul style="list-style-type: none"> None anticipated
<p>Residual impacts:</p> <ul style="list-style-type: none"> None anticipated

Table 50: Impact on sense of place: Operational Phase

NATURE: IMPACT ON SENSE OF PLACE		
	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	Medium (52)	Medium (39)
Status (positive or negative)	Negative	Negative
Reversibility	No	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	To a limited extent	
<p>Mitigation:</p> <ul style="list-style-type: none"> Removal of the power lines and ancillary infrastructure once the lifespan has expired (decommissioning). The mitigation measures of the Visual Impact Assessment should be strictly implemented 		
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> Cumulative visual impacts on the sense of place of the rural character of the area are associated with the proposed power line, the various components of the Karoshoek Development, the PV facilities and CSP facilities proposed in the Upington area, the DOE Solar Park and the Eskom CSP plant. 		
<p>Residual impacts:</p> <ul style="list-style-type: none"> Negative visual intrusion of the landscape 		

11. CONCLUSIONS

From the social impact assessment undertaken the following conclusions associated with the different components proposed as part of the Karoshoek Development came to the fore:

11.1 Site 2: Karoshoek Concentrating Photovoltaic or Parabolic Dish (CPVPD) 1, 2, 3 and 4

- Site 2 of the Karoshoek Development would involve some two hundred (200) workers during the peak of the construction phase and approximately twenty (20) permanent employees. The benefits to the local human resources are thus significant even if the majority of employment opportunities would only be available during the construction phase of the project. Benefits can be enhanced should the applicant and all of their partners be truly committed to the social upliftment and capacity building of the local community.
- The inflow of 200 workers to the area would have definite impacts on the local social environment of those living in close proximity to the site as the area is currently scarcely populated and characterized as a peaceful rural environment.
- The escalation in people movement and presence of workers (and possibly jobseekers) on site could result in increased risks for criminal activities compromising the current safety and security profile of the local communities.
- The farm Karos is used for game farming and leisure activities. As vegetation would be lost (approximately 250 ha), a negative impact on the grazing capacity of the property (6 000 ha) would occur. It is however not anticipated that the construction activities or the proposed facility on the farm Karos would have direct negative impacts on the farming activities of the neighbouring property owners to the eastern side and north-western side of the property, except if livestock theft occurs on those properties and if the safety and security of those farmers are compromised due to the influx of workers to the area.
- The impacts on the daily living and movement patterns on the local community would mainly refer to the intrusions felt during the construction phase, such as the increase in movement of workers in the area, increase in traffic levels and associated increased risks of accidents, as well as noise and dust pollution. During the operational phase, the impacts on the living and movement patterns of the local communities are not anticipated to be severe.

- New infrastructure such as Concentrating Photovoltaic facilities or Parabolic dishes would have a severe negative impact on the landscape character and aesthetic quality of the area. Even though the viewer incidence of the facility would be limited due to the distance of homesteads, dwellings and the N10 from the site, the proposed facility could still be visible from specific viewpoints. It is not anticipated that the impact on the sense of place can be successfully mitigated.

11.2 Site 1.1: Karoshoek LF 1

- Site 1.1 of the facility would involve some six hundred workers (600) during the peak of the construction phase and approximately forty (40) permanent employees. The benefits to the local human resources are thus significant even if the majority of employment opportunities would only be available during the construction phase of the project. Benefits can be enhanced should the applicant and all of their partners be truly committed to the social upliftment and capacity building of the local community.
- The inflow of 600 workers to the area would have definite impacts on the local social environment of those living in close proximity to the site as the area is currently scarcely populated and characterized as a peaceful rural environment.
- The escalation in people movement and presence of workers (and possibly jobseekers) on site could result in increased risks for criminal activities compromising the current safety and security profile of the local communities.
- The farms Annashoek and Zandemm are currently mainly used for cattle farming. A small section of the farm Annashoek is used for the production of raisins (north of the N10). As vegetation would be lost (approximately 500 ha), a negative impact on the grazing capacity of the properties would occur. To limit the negative impacts in this regard it is proposed that the LF facility be fenced to ensure the continuation of cattle farming activities on the remaining section of the property.
- It is furthermore not anticipated that the construction activities or the proposed facility would have direct negative impacts on the farming activities of the neighbouring property as these would form part of the overall Karoshoek Development. Farming activities on those adjoining farms are expected to continue in the areas outside the development footprint.
- The impacts on the daily living and movement patterns on the local community would mainly refer to the intrusions felt during the construction phase, such as the increase in movement of workers in the area, increase in traffic levels and associated increased risks of accidents, as well as noise and dust pollution. During the operational phase,

the impacts on the living and movement patterns of the local communities are not anticipated to be severe.

- New infrastructure such as a LF facility would have a severe negative impact on the landscape character and aesthetic quality of the area. The cumulative impacts of sites 1.1, 1.2 (Ilanga facility), 1.3 and 1.4 should also be considered, as the concentration of the infrastructure in this specific area is anticipated to increase the impact on the sense of place. However, it should further be noted that sites 1.1 to 1.4 on the farms Zandemm and Annashoek would be accompanied by other similar infrastructure (Site 2 on the farm Karos, as well as Sites 3, 4 and 5 on the farm Matjesrivier) which would focus and limit the viewer incidence to employees at these sites. Even though the viewer incidence of the facility would be limited due to the distance of homesteads, dwellings and the N10 from the site, the proposed facility could still be visible from specific viewpoints to residents of the study area. It is not anticipated that the impact on the sense of place can be successfully mitigated.

11.3 Site 1.3: Karoshoek PT

- Site 1.3 of the facility would involve some eight hundred workers (800) during the peak of the construction phase and approximately eighty (80) permanent employees. The benefits to the local human resources are thus significant even if the majority of employment opportunities would only be available during the construction phase of the project. Benefits can be enhanced should the applicant and all of their partners be truly committed to the social upliftment and capacity building of the local community.
- The inflow of 800 workers to the area would have definite impacts on the local social environment of those living in close proximity to the site as the area is currently scarcely populated and characterized as a peaceful rural environment.
- The escalation in people movement and presence of workers (and possibly jobseekers) on site could result in increased risks for criminal activities compromising the current safety and security profile of the local communities.
- The farm Zandemm is currently used for cattle farming. As vegetation would be lost (approximately 500 ha), a negative impact on the grazing capacity of the properties would occur. It is furthermore not anticipated that the construction activities or the proposed facility would have direct negative impacts on the farming activities of the neighbouring property as these would form part of the overall Karoshoek Development. Farming activities on those adjoining farms are expected to continue in the areas outside the development footprint.

- Farming activities on the farm Karos (to the north of the farm Zandemm) are thus expected to continue in the areas outside the development footprint. Construction activities or the proposed facility would also not have direct negative impacts on the farming activities of the neighbouring property owners to the southern and south-western side of the property, except if livestock theft occurs on those properties and if the safety and security of those farmers are compromised due to the influx of workers to the area.
- The impacts on the daily living and movement patterns on the local community would mainly refer to the intrusions felt during the construction phase, such as the increase in movement of workers in the area, increase in traffic levels and associated increased risks of accidents, as well as noise and dust pollution. During the operational phase, the impacts on the living and movement patterns of the local communities are not anticipated to be severe.
- New infrastructure such as a PT facility would thus have a severe negative impact on the landscape character and aesthetic quality of the area. The cumulative impacts of sites 1.1, 1.2 (Ilanga facility), 1.3 and 1.4 should also be noted, as the concentration of the infrastructure in this specific area is anticipated to increase the impact on the sense of place. Even though the viewer incidence of the facility would be limited due to the distance of homesteads, dwellings and the N10 from the site, the proposed facility could still be visible from specific viewpoints. The Langberg could limit the visual impact to the east of the farm Zandemm. Lighting (for security purposes) also remains of concern. It is not anticipated that the impact on the sense of place can be successfully mitigated.

11.4 Site 1.4, 3, 4 and 5: Karoshoek CSP Facility

- The CSP facility would involve some eight hundred workers (800) during the peak of the construction phase and approximately eighty (80) permanent employees. The benefits to the local human resources are thus significant even if the majority of employment opportunities would only be available during the construction phase of the project. Benefits can be enhanced should the applicant and all of their partners be truly committed to the social upliftment and capacity building of the local community.
- The inflow of 800 workers to the area would have definite impacts on the local social environment of those living in close proximity to the site as the area is currently scarcely populated and characterized as a peaceful rural environment.

- The escalation in people movement and presence of workers (and possibly jobseekers) on site could result in increased risks for criminal activities compromising the current safety and security profile of the local communities.
- Portion 2 and RE of the farm Matjesrivier, as well as the farms Zandemm and Annashoek are currently used for cattle farming. As vegetation would be lost (approximately 500 ha), a negative impact on the grazing capacity of the properties would occur. To limit the negative impacts in this regard it is proposed that the different components of the CSP facility such as the LFT, towers and LFTT be fenced to ensure the continuation of farming activities on the remaining sections of the properties.
- High potential farming areas exist along the Gariep River where grapes and raisins are produced. These are situated to the north of the N10 and the proposed farms and would thus not be directly affected by the proposed CSP facility due to the distance from the various sites proposed on these farms.
- Construction activities of the proposed LFTT facility on Site 5 could however have indirect negative impacts on the farming activities of the neighbouring property to the south of Portion 2 of the farm Matjesrivier, as Site 5 is close to the border of this farm. This would mainly refer to noise and dust. It is therefore anticipated that these temporary negative impacts could be mitigated to ensure that farming activities on the farm Trooilapspan could continue uninterrupted. Theft of livestock on those properties to the south and west of the farm Matjesrivier remains a concern and if the safety and security of those farmers are compromised due to the influx of workers to the area, it would result in severe negative social impacts.
- The impacts on the daily living and movement patterns on the local community would mainly refer to the intrusions felt during the construction phase, such as the increase in movement of workers in the area, increase in traffic levels and associated increased risks of accidents, as well as noise and dust pollution. During the operational phase, the impacts on the living and movement patterns of the local communities are not anticipated to be severe.
- New infrastructure such as the components of the CSP facility would thus have a severe negative impact on the landscape character and aesthetic quality of the area. The cumulative impacts of sites 3, 4 and 5 on the farm Matjesrivier with the different types of infrastructure should also be noted, as the concentration of the infrastructure on this farm is anticipated to have different disturbing impacts (e.g. difference in shape, heights and so forth) on the landscape and could thus increase the impact on the sense of place. Even though the viewer incidence of the components would be limited due to the distance of homesteads and dwellings from the sites, as well as the Groblershoop

gravel road to the east of the farm Matjesrivier and the N10, the proposed facilities could still be visible from specific viewpoints. Lighting (for security purposes) is also of concern.

11.5 Grid Connection

- Construction of the proposed power line and substation would be undertaken by Eskom contractors and will probably not create large scale job opportunities.
- During the operational phase of a power line, limited and intermittent job opportunities exist for local SMMEs or local labourers to source temporary employment e.g. inspections of the lines and servitudes, the clearing of the servitude and general maintenance activities.
- Limited changes in the population profile are expected as a result of the proposed power line.
- The movement of workers on the properties during the construction phase would have an impact on the farming activities if the construction vehicles do not keep to the access roads and in cases where livestock theft occurs. These negative impacts can thus be mitigated by proper conduct by workers.
- The proposed power line would have a limited long term impact on stock farming activities as animals can still graze underneath the proposed line and within the servitude
- The impact on the farming activities as a result of the proposed substation on the farm Annashoek would be limited to the footprint of the facility which is small in comparison to the other components of the Karoshoek Development.
- Impacts on the daily living and movement patterns of property owners refer to the intrusions felt during the construction phase as a result of the movement of construction workers, construction vehicles, possible noise and dust creation, as well as the higher risk of veld fires.
- Safety and security always remain of concern where construction workers are present. It is anticipated that this concern would persist, especially due to the presence of other larger construction teams undertaking construction activities for the Karoshoek Development in the greater study area.
- The impact of the power line and the associated infrastructure on the visual aesthetics and sense of place of the study area cannot be mitigated during the operational phase,

but only once the lifespan of the power line and the infrastructure have expired (decommissioning).

11.6 General

The following general conclusions regarding the comprehensive Karoshoek Development should be noted:

- From a social perspective it can be concluded that the proposed Karoshoek Development would not result in permanent damaging social impacts. The socio-economic benefits associated with the Karoshoek Development outweigh the negative social impacts. No negative social impacts that could be classified as fatal have been identified and there are also no impacts of such a high significance that they could prevent the project from continuing. It is thus concluded that the proposed project is acceptable from a social point of view, provided that mitigation measures are strictly implemented.
- Construction of the entire Karoshoek Development would result in approximately 2 400 employment opportunities over a long term period of ten to twelve years. As a large component of these workers would fall within the semi-skilled to low skilled categories it is highly likely that local individuals could intermittently benefit from these temporary employment opportunities. Skills training could furthermore ensure that locals could be re-employed for the different components during the entire construction process thereby ensuring continuous long term benefits to those individuals.
- The operational phases of the overall Karoshoek Development would result in much fewer employment opportunities (approximately 240 in total) but it should be noted that these employment opportunities would ensure various economic benefits to those permanent employees and their families in the long term. It is thus imperative that locals be sourced or trained to fill these positions.
- Downstream positive economic spin-offs through local procurement and possible manufacturing of components required as part of the various structures and associated facilities, could enhance the socio-economic opportunities of the proposed project. Local content should thus be maximised.
- Socio-economic benefits associated with the proposed Karoshoek Development should be ploughed back into the local communities to ensure sustainable development during the long term construction period of approximately 12 years, as well as during the entire operational lifespan of the various components. The benefits to the local human

resources are thus vast, if the applicant and all of their partners are truly committed to the social upliftment and capacity building of the local community.

- Construction activities of the various components would possibly result in negative intrusion impacts on the social environment which would be more severe during peak construction periods. Stagnant periods with no or limited impacts could occur between the different construction timeframes. The cumulative impact of the construction of the various facilities, however, could result in long term negative impacts such as possible increase in crime, degradation of local roads, increased pressure on existing infrastructure and services and so forth.
- The cumulative negative intrusions and possible overall impacts can again be mitigated by the employment of locals.
- Due to the size and extent of the proposed Karoshoek Development, the characteristics of the rural area would permanently change. The sense of place could be affected by intrusion impacts (noise and dust), safety and security issues, visual impacts, an increase in movement or traffic and so forth. However, it is still anticipated that once operational, the different facilities would have limited negative impacts on the social environment. It is anticipated that farming activities could continue on those sections of the properties that are not affected by the development footprint. In addition minor impacts on the surrounding farming activities are foreseen should safety and security of those farmers not be compromised through the presence of the construction and/or permanent workforce.
- It is unlikely that the negative impact of the various facilities on the overall sense of place can be successfully mitigated.
- Should the construction activities of the various components of the Karoshoek Development simultaneously be undertaken, the intrusion impacts on the local community would be enhanced. Due to the low population density in the study area, there might not be sufficient numbers of workers with the required skills available to undertake the construction activities. The project proponent could then revert to intensive capacity building and skills training, but could also focus on employing low-skilled and/or unskilled individuals from outside the study area or even municipal area. The latter would not be preferred as training and capacity building of local community members would ensure that benefits accrue locally and would assist with sustainable development of the area.
- The proposed Karoshoek Development would fit in with the government's new "green economy" growth path, the Integrated Resource Plan for electricity (IRP 2010) adapted by Government in 2011, as well as with the vision that the Upington area is highly

suitable for renewable solar energy projects. The Karoshoek Development could thus form a key part of the concentrated zone of solar development within the area.

12. RECOMMENDATIONS

From a social perspective the following recommendations are made:

- Mitigation and enhancement measures proposed should be noted as recommendation measures.
- The use of local labour should be maximised as it could assist in mitigating various other social impacts, but would also enhance the potential benefits of the proposed project to the local community members
- Capacity building, social responsibility and skills training remain imperative as the implementation thereof would determine the success of the project in terms of community upliftment and the overall sustainability of the project.
- The job creation and training aspect would have to be well-planned and executed. The key optimisation measure is to ensure that locals (individuals; SMMEs) with the relevant skills/expertise are employed for construction. This would necessitate the creation of a labour desk as well as a skills audit to identify skills levels and determine training requirements. Multi-skills training would be sensible to ensure that skills are transferable and employment sustainable.
- Local procurement would have various trickle down positive socio-economic impacts on the beneficiary communities and local businesses. This aspect should thus be pursued as far as possible.
- Local residents, with the focus on the surrounding landowners and communities, should receive accurate information with regards to the project status, timeframes for construction and other relevant information about issues that could influence their daily living and movement patterns.
- Intrusion impacts during the construction and operational phases should be kept to a minimum and mitigation measures to limit e.g. dust pollution, noise pollution and so forth should be implemented across the board.
- The possible negative impact on the safety profile of the local communities and farmers would remain a source of concern. Safety and security measures must thus be addressed pro-actively and throughout the life of the project.
- The negative impact on the sense of place and quality of life of the surrounding property owners, mainly due to the visual impact of the different components of the Karoshoek

Development should be attended to through proper design and appropriate mitigation measures.

- Social development support and the input into LED programmes should be linked to the local priority projects as stipulated in the Integrated Development Plans and Strategic Development Frameworks of the //Khara Hais Municipality.
- The proposed development should take cognisance of other similar type of developments in the area. Negative cumulative impacts could be mitigated through the creation of a localised Solar Energy Forum. Representation on such a forum could include the various project proponents, representatives of the //Khara Hais Municipality, the Siyanda District Municipality and community representatives.

13. SOCIAL MANAGEMENT PLAN

From a social perspective the following objectives and measures should be included as part of the Social Management Plan which would again be included in the Environmental Management Plan (EMP) for the proposed facility.

13.1 Employment Creation

OBJECTIVE:	Enhance positive social impacts associated with the creation of employment and local procurement
Project component/s	<ul style="list-style-type: none"> • Employment creation and the availability of required skills in the local communities
Potential Impact	<ul style="list-style-type: none"> • The opportunities and benefits associated with the creation of local employment and business could be maximised
Activities/risk sources	<ul style="list-style-type: none"> • Local labour is not employed for semi-skilled or unskilled positions. • Sourcing of individuals outside the municipal area • Increased pressure on infrastructure and services as a result of the inflow of outside workers and/or jobseekers
Mitigation: Target/Objective	<ul style="list-style-type: none"> • FG Emvelo in cooperation with the //Khara Hais Local Municipality, should aim to employ a maximum number of the unskilled, low-skilled and semi-skilled workers from the local area where possible. Should the necessary skills not be readily available, skills training and capacity building should be undertaken.

Mitigation: Action/control	Responsibility	Timeframe
The local labour content should be maximised as far as possible.	FG Emvelo	Pre-Construction Construction Operation
A skills audit should be undertaken to	FG Emvelo	Pre-Construction

Mitigation: Action/control	Responsibility	Timeframe
determine the skills available in the local communities and the discrepancy with the requirements of the project.		
Training and capacity building of locals are imperative and should also aim to equip locals with sufficient skills to enable them to be employable as permanent employees. Short term construction related employment opportunities could then be changed to long term benefits which could then accrue to the local communities who are in dire need of employment.	FG Emvelo	Pre-Construction Construction
Skills training should thus be transferable and employment opportunities sustainable.	FG Emvelo	Pre-Construction Construction Operation
A broad-based approach should be followed to identify and involve relevant organisations which could assist the main contractor and project proponent in identifying people whose skills may correspond with the job specifications	FG Emvelo	Pre-Construction
Employing as many locals as possible would assist in combatting crime in the area.	FG Emvelo	Construction Operation
The project proponent and contractors should create conditions that are conducive for the involvement of entrepreneurs, small businesses, and SMMEs during the construction process.	FG Emvelo	Construction Operation
Tender documentation should contain guidelines for the involvement of labour, entrepreneurs, businesses, and SMMEs from the local sector.	FG Emvelo	Construction Operation
Communication efforts concerning job creation opportunities should refrain from creating unrealistic expectations.	FG Emvelo	Pre-Construction Construction
The developer should capacitate locals where possible to enable them to secure full time employment. Skills development focused on the operational phase should thus start during the construction phase where practically possible.	FG Emvelo	Construction Operation
Where possible, the developer should consider training and capacity building programmes to lessen the skills disparity between the local community and the permanent jobs on offer.	FG Emvelo	Construction Operation

Mitigation: Action/control	Responsibility	Timeframe
Individual tailor made training programmes for full time employees should be embarked upon in association with accredited training facilities to ensure long term benefits to those involved.	FG Emvelo	Operation
Bursaries to suitable candidates should be considered.	FG Emvelo, EPC Partner & Contractor	Operation
Long term permanent job opportunities should be advertise in a "user friendly" and easily accessible manner.	FG Emvelo, EPC Partner & Contractor	Operation

Performance Indicator	<ul style="list-style-type: none"> • Job opportunities, especially of low to semi-skilled positions, are primarily awarded to members of local communities. • Locals are taken into account during the recruitment process. • SMMEs are awarded with contracts during the construction phase. • Labour, entrepreneurs, businesses, and SME's from the local sector are awarded with jobs, based on requirements in the Tender Documentation. • The involvement of local labour is promoted. • Reports are not made by members of the local communities regarding unrealistic employment opportunities or that only outsiders were employed.
Monitoring	<ul style="list-style-type: none"> • FG Emvelo, their EPC Partner and or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.

13.2 Population Change

OBJECTIVE:	Limit the inflow of temporary workers and jobseekers during the construction phase, and promote presence of local permanent personnel during the operational phase
Project component/s	<ul style="list-style-type: none"> • The inflow of temporary workers and jobseekers during the construction phase, as well as the presence of permanent personnel during the operational phase of the project
Potential Impact	<ul style="list-style-type: none"> • Intrusion impacts on neighbouring property owners • Possible negative impact on safety and security in the local area • Outsiders placing an additional burden on the provision of services and infrastructure • Possible negative social impacts due to jobseekers at the site and the impact on infrastructure and services should they remain in the area • Increased noise on site • Spreading of sexually transmitted diseases • Littering

	<ul style="list-style-type: none"> • Social conflict between locals and these workers with regards to employment opportunities or conflict between “outside” workers and locals during after hour social contact
Activity/risk source	<ul style="list-style-type: none"> • Local labour is not employed for semi-skilled or unskilled positions. • Sourcing of individuals outside the municipal area • Conflict • safety and security impacts • additional burden on the provisions of services and infrastructure
Mitigation: Target/Objective	<ul style="list-style-type: none"> • FG Emvelo and their EPC partner, in cooperation with the //Khara Hais Local Municipality, should aim to employ a maximum number from the local area where possible.

Mitigation: Action/control	Responsibility	Timeframe
Locals should be employed as far as possible	FG Emvelo & EPC Partner	Pre-Construction Construction
Should local accommodation facilities within the study area be available, it should be considered for housing some members of the construction workforce	FG Emvelo & EPC Partner	Pre-Construction Construction
Construction workers should be transported to and from the site via busses. These vehicles should be in good working order and should adhere to all traffic related regulations	FG Emvelo & EPC Partner	Pre-Construction Construction
Construction workers should be easily identifiable and should remain at the construction site during working hours	FG Emvelo & EPC Partner	Construction
No trespassing of private properties should be allowed	FG Emvelo & EPC Partner	Construction
Construction workers should be supervised at all times.	FG Emvelo & EPC Partner	Construction
Construction activities should be kept to normal working hours e.g. from 7 am until 5 pm during weekdays	FG Emvelo & EPC Partner	Construction
Employees should understand that excessive noise could be problematic and should thus attend to this issue in a sensitive manner	FG Emvelo & EPC Partner	Construction
Local community representatives, policing forums and those from the //Khara Hais Local Municipality should be informed of the size and presence of the construction workforce	FG Emvelo & EPC Partner	Pre-construction Construction
The construction site should be kept litter free and proper sanitation and waste management infrastructure should be	FG Emvelo & EPC Partner	Construction

Mitigation: Action/control	Responsibility	Timeframe
implemented		
HIV/Aids awareness campaigns should be undertaken among the workforce	FG Emvelo & EPC Partner	Construction
The construction site should be fenced and managed by permanent security personnel	FG Emvelo & EPC Partner	Construction
Accommodation requirements should be communicated to the hospitality industry within Upington, representatives of the //Khara Hais Municipality and the local community forums to ensure adequate facilities are available as required for the entire workforce of the Karoshoek Development	FG Emvelo & EPC Partner	Pre-Construction Construction
Workers should preferably not be accommodated within the smaller settlements such as Karos and Leerkrans as these settlements would probably require additional or upgrading of existing infrastructure and services to lodge additional individuals. This could then result in undesirable planning and cost implications to the //Khara Hais Municipality.	FG Emvelo & EPC Partner	Construction
Workers should wear identity tags and uniforms to be easily identifiable.	Eskom	Construction
Property owners should be notified (preferably in writing) in advance when and what type of construction activities would take place on their properties	Eskom	Construction
Workers and contractors should undergo induction training which should include the issue of general good conduct and environmentally sustainable construction practices.	Eskom	Construction
Workers and contractors on site should be monitored to ensure that no littering and/or environmental pollution or degradation occurs.	Eskom	Construction
Normal working hours (e.g. 7am to 5pm) should be considered	FG Emvelo	Operation

Performance Indicator	<ul style="list-style-type: none"> • Job opportunities, especially of lower skilled positions, are primarily awarded to members of local communities. • Construction activities have the minimum negative impacts on the social environment • Criminal activities do not increase and no complaints are received in this
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	<p>regard</p> <ul style="list-style-type: none"> No noise and dust pollution Limited intrusions on host communities Limited or no reports from property owners regarding problems with construction activities and workforce No degradation of local roads No increased accidents No reports of fires and other emergencies No security threats and no increase in criminal activities that could be attributed to individuals involved in the facility's construction and operation
Monitoring	<ul style="list-style-type: none"> FG Emvelo, community leaders, property owners and //Khara Hais Local Municipality must monitor indicators listed above to ensure that they have been implemented.

13.3 Impact on farming activities

OBJECTIVE:	Limit possible negative impacts on the farming activities in the area and on the affected properties
Project component/s	<ul style="list-style-type: none"> Changes or disruptions in the farming activities of affected property owners and neighbouring residents Possible safety and security risks as a result of the proposed project
Potential Impact	<ul style="list-style-type: none"> Possible increase in dust and noise Traffic related impacts Change in visual character Possible increase in crime due to influx of people to the area Sterilisation of land for farming activities
Activity/risk source	<ul style="list-style-type: none"> Possible increase in crime due to influx of people to the area Dust pollution Noise pollution Degradation of local roads Lack of local labourers for farming activities Conflict with regards to remuneration packages Poaching of livestock
Mitigation: Target/Objective	<ul style="list-style-type: none"> Limit any negative impacts on the host communities' farming activities

Mitigation: Action/control	Responsibility	Timeframe
Construction activities should not interfere with the farming activities that would continue on the remaining farming sections.	FG Emvelo, EPC Partner and Contractor	Construction
Local labourers should be used during the construction phase to limit the inflow of	FG Emvelo, EPC Partner and Contractor	Construction

Mitigation: Action/control	Responsibility	Timeframe
outsiders to the area.		
Remuneration packages should be market related and should take note of the sensitivities at hand.	FG Emvelo, EPC Partner and Contractor	Construction
The facility should be fenced to enable the property owners to continue with cattle farming activities if feasible.	FG Emvelo, EPC Partner and Contractor	Construction
Where possible, livestock should be moved away from the construction activities for the power line and/or be fenced off for the duration of construction activities in a specific area, especially on the farm Vaalkoppies	FG Emvelo, EPC Partner and Contractor	Construction
Eskom should discuss the construction schedule and activities with the affected farmers to enable them to plan their farming activities and animal movement accordingly	FG Emvelo, EPC Partner and Contractor	Construction
Conditions and/or specific requests relating to construction activity raised by property owners should be included in the EMP document	FG Emvelo, EPC Partner and Contractor	Pre-Construction and Construction
Contractors should make sure that no materials are left on the properties after construction activities have been completed	FG Emvelo, EPC Partner and Contractor	Construction
Additional access roads should be limited	FG Emvelo, EPC Partner and Contractor	Construction
Construction vehicles should keep to the access roads allocated for the construction activities	FG Emvelo, EPC Partner and Contractor	Construction
Sensitivities with regards to the farming practices should be considered when finalising a line alignment.	FG Emvelo, EPC Partner and Contractor	Pre-Construction
The alignments should not negatively impact on income generating activities undertaken on the farms.	FG Emvelo, EPC Partner and Contractor	Construction Operation

Performance Indicator	<ul style="list-style-type: none"> • No noise and dust pollution • Limited intrusions on host communities • Limited or no reports from property owners regarding problems with construction activities and workforce • No degradation of local roads • No poaching of livestock and small game • No increased accidents • No reports of fires and other emergencies
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	<ul style="list-style-type: none"> No security threats and no increase in criminal activities that could be attributed to individuals involved in the facility's construction and operation Limited visual impact of facility
Monitoring	<ul style="list-style-type: none"> FG Emvelo, their EPC Partner, property owners, the //Khara Hais Local Municipality and appointed ECO must monitor indicators listed above to ensure that they have been implemented

13.4 Impact on daily living and movement patterns

OBJECTIVE	Limit possible negative impacts on the quality of life of the host communities
Project component/s	<ul style="list-style-type: none"> Changes or disruptions in the daily living and working activities of neighbouring residents Possible safety and security risks as a result of the proposed project Change in visual character of the area
Potential Impact	<ul style="list-style-type: none"> Possible increase in dust and noise Traffic related impacts Change in visual character Possible increase in crime due to influx of people to the area
Activities/risk sources	<ul style="list-style-type: none"> Increased risk of accidents due to increase in vehicle movement Possible degradation of local roads Change in visual character Possible increase in crime due to influx of people to the area Increased health risks during construction phase
Mitigation: Target/Objective	Limit any negative impacts on the host communities' daily living and movement patterns

Mitigation: Action/control	Responsibility	Timeframe
The construction site and storage areas should be fenced off to avoid unauthorised entry	FG Emvelo	Construction
Construction vehicles and those transporting materials and goods should be inspected to ensure that these are in good working order and not overloaded.	FG Emvelo	Construction
Construction vehicles should adhere to the speed limits and traffic regulations.	FG Emvelo	Construction
Upgrading of the entrance to the site from the N10 should be investigated and discussed with the relevant road agency or department.	FG Emvelo	Pre-Construction
Additional access roads at the construction sites should be kept to a minimum.	FG Emvelo	Construction

Mitigation: Action/control	Responsibility	Timeframe
Construction related noise and dust pollution should be limited.	FG Emvelo	
Gravel roads should be sprayed with water to limit dust creation if economically feasible and reasonable from an environmental perspective (water scarce area) or an appropriate dust suppressant should be used.	FG Emvelo	Construction
Normal working hours (e.g. 7am to 5pm) should be considered.	FG Emvelo	Construction
Property owners that would be affected by the transmission line construction should be consulted prior to the construction phase with regards to the construction schedules, transportation corridors, construction of additional access roads and construction methods to be used	FG Emvelo	Construction
Locals should be employed as far as possible.	FG Emvelo	Operation
Employees should understand that excessive noise could be problematic and should thus attend to this issue in a sensitive manner.	FG Emvelo	Operation
The facility should be properly maintained and managed to avoid any form of pollution.	FG Emvelo	Operation
The local access road to the site should be regularly maintained to keep the local road conditions in a good quality state	FG Emvelo	Operation
Property owners should be notified of the maintenance activities to be undertaken on their properties	FG Emvelo	Operation

Performance Indicator	<ul style="list-style-type: none"> • No noise and dust pollution • Limited intrusions on host communities • Limited or no reports from property owners regarding problems with construction activities and workforce • No degradation of local roads • No increased accidents • No reports of fires and other emergencies • No security threats and no increase in criminal activities that could be attributed to individuals involved in the facility's construction and operation • Limited visual impact of facility
Monitoring	<ul style="list-style-type: none"> • FG Emvelo and landowners must monitor indicators listed above to ensure that they have been implemented

13.5 Impact on sense of place

OBJECTIVE	Limit the impact on the visual environment and sense of place
Project component/s	<ul style="list-style-type: none"> Visual impact of the different components of the project and power line
Potential Impact	<ul style="list-style-type: none"> Impact on sense of place
Activities/risk sources	<ul style="list-style-type: none"> Impact on sense of place
Mitigation: Target/Objective	<ul style="list-style-type: none"> Limited impact on visual environment and sense of place

Mitigation: Action/control	Responsibility	Timeframe
Storage areas should be fenced off.	FG Emvelo	Construction
Soils should be replaced and the construction area, as well as laydown areas should be rehabilitated as soon as possible after construction.	FG Emvelo	Construction
The construction site should be kept litter free.	FG Emvelo	Construction
Overall site rehabilitation should occur as soon as the construction process allows.	FG Emvelo	Construction
The recommendations made by the Visual Impact Assessment should be adhered to	FG Emvelo	Construction Operation
The design and specific positioning of the facility should aim to minimise the possible negative visual impact of the facility on the surrounding property owners.	FG Emvelo	Operation
The design of the security buildings should blend in with surrounding environment.	FG Emvelo	Operation
Lighting issues should receive the attention it deserves to avoid any light pollution at night	FG Emvelo	Operation

Performance Indicator	<ul style="list-style-type: none"> Limited negative impacts on the visual environment
Monitoring	<ul style="list-style-type: none"> FG Emvelo and landowners must monitor indicators listed above to ensure that they have been implemented

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