

# DANIELSKUIL ROMA ENERGY SOLAR PLANT

(Erf 753 Danielskuil)



## FINAL BASIC ASSESSMENT REPORT

DEA Ref no: 14/12/16/3/3/1/473 (DEA/EIA/0000999/2012)

May 2012

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# DANIELSKUIL ROMA ENERGY SOLAR PLANT

ERF 753, DANIELSKUIL

APPLICATION FOR AUTHORIZATION IN TERMS OF THE NATIONAL  
ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998), AS  
AMENDED AND THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS,  
2010

## PREPARED FOR:

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DEA REF NO: 14/12/16/3/3/1/473  
(DEA/EIA/0000999/2012)



## environmental affairs

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA

(For official use only)

**File Reference Number:**

**Application Number:**

**Date Received:**


Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2010, promulgated in terms of the National Environmental Management Act, 1998(Act No. 107 of 1998), as amended.

**Kindly note that:**

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2010 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
3. Where applicable **tick** the boxes that are applicable in the report.
4. An incomplete report may be returned to the applicant for revision.
5. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
6. This report must be handed in at offices of the relevant competent authority as determined by each authority.
7. No faxed or e-mailed reports will be accepted.
8. The report must be compiled by an independent environmental assessment practitioner.
9. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
10. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.

**SECTION A: ACTIVITY INFORMATION**

Has a specialist been consulted to assist with the completion of this section? 

YES X	
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If YES, please complete the formentitled "Details of specialist and declaration of interest" for appointment of a specialist for each specialist thus appointed:

***See Individual Declarations within each Specialist Assessments Report attached in Appendix D.***

Any specialist reports must be contained in Appendix D.

**1. ACTIVITY DESCRIPTION**

Describe the activity, which is being applied for, in detail:

Please note that this description should not be a verbatim repetition of the listed activity as contained in the relevant Government Notice, but should be a brief description of activities to be undertaken as per the project description.

**1.1 REASON FOR APPLICATION**

This application has been made in terms of the need to expand electricity generation capacity in South Africa, based on national policy and is informed by on-going strategic planning undertaken by the Department of Energy (DoE).

The DoE commissioned a National Integrated Resource Plan (IRP) in order to provide a long-term, cost-effective resource plan for meeting electricity demand, which is consistent with reliable electricity supply and environmental, social, and economic policies in response to the National Energy Policy's objective relating to affordable energy services. The planning horizon for the study was from 2010 to 2030.

The objective of the IRP is to determine the least-cost supply option for the country, provide information on the opportunities for investment into new power generating projects, and evaluate the security of supply. The long-term electricity planning goal is to ensure sustainable development considering technical constraints, economic constraints, social constraints, and externalities.

A target of 17,8 GW of renewables by 2030 has been set by the DoE within the Integrated Resource Plan (IRP) 2010, to be produced mainly from wind, solar, biomass and small-scale hydro (with wind and solar comprising the bulk of the power generation capacity). This amounts to approximately 42% of the total estimated electricity generation capacity by 2030 being from renewables. This translates to approximately 9% of the power generated being produced by renewable energy. This is however dependent on the assumed learning rates and associated cost reductions for renewable options.

Roma Energy Danielskuil(Pty) Ltd is proposing the establishment of a Concentrating Photovoltaic (CPV) facility for the purpose of commercial electricity generation on an identified site located on a portion of Erf 753 Danielskuil, approximately 2.2km south-east of Danielskuil in the Northern Cape Province (refer to Figure 1 below). Danielskuil sub-station is located onsite with the Waste Water Treatment Works directly adjacent to the north and with Idwala lime mine across the R31 to the east. This portion of the Erf is currently vacant and owned by IdwalaIndustrial Holdings (Pty) Ltd.

***Please note:*** Originally two broad site alternatives was identified (Refer to Agricultural Assessment in Appendix D1). The left-hand site was investigated due to having less power line and sub-station infrastructure, with the possibility for easier construction onsite. On recommendations given after the Agricultural site visit (in order to minimise environmental impact) it was decided to rather remain on the right-hand side site due to less water lodged soils. Therefore only this site was assessed by all other specialists as the alternative site was seen as a 'no-go' site.

The proposed project will have a maximum generating capacity of 10 MW which will be evacuated into the national electricity grid as part of a power purchase agreement with Eskom and the South African Treasury. The 20 Ha site could also be used for conventional PV electricity generation, but for a reduced supply of ~7 MW.

The Northern Cape region is preferred for solar energy development by virtue of its annual direct solar irradiation values. From a local perspective, the site is preferred due to its suitable topography (i.e. in terms of slope), proximity to a grid connection point (i.e. for the purpose of electricity evacuation), site access (i.e. to facilitate the movement of machinery during the construction phase), and by the extent of the site (a large area of >1000 Ha was available for the eventual choosing of the 20 Ha site).

The potential environmental impacts associated with the construction, operation and decommissioning phases are explored in more detail in this Basic Assessment Report.



Figure 1 – Investigation Area in South-east Danielskuil, with preferred site located to the northeast.

This report has been compiled in accordance with the requirements of the EIA Regulations and includes details of the activity description; the site, area and property description; the public participation process; the impact assessment; and the recommendations of the Environmental Assessment Practitioner.

## 1.2 PROJECT DESCRIPTION

Concentrating photovoltaic (CPV) systems convert light energy into electricity in the same way conventional PV technology does. The difference lies in the addition of an optical system that focuses a large area of sunlight onto each cell for providing reduced energy costs and improved manufacturability and reliability.

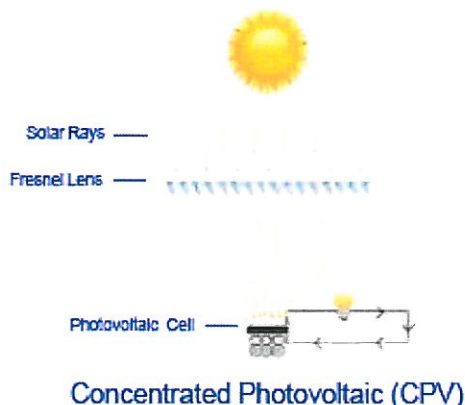


Figure 2 – Illustrating CPV methodology

### Optical System:

CPV technology utilizes an optical element to collect the sun's light, and concentrate it at between 250-1000 suns (times) onto high efficiency solar cells that are 1 square centimeter in size. The basic concept is to replace expensive solar cell material with optical elements created from less expensive, readily available materials such as glass. In the example to the left SolFocus uses a primary mirror to collect the sunlight, focuses it on a secondary mirror, and then down the optical rod onto the high efficiency III-V cell.

### High Efficiency Cells:

The cells used in CPV systems are over twice the efficiency of traditional silicon-based PV cells, approaching 40% compared with 15% - 19% for traditional silicon. The use of these cells provides much higher energy yield with less photovoltaic material.

### Tracking System:

CPV systems must track the sun in order to ensure the focusing of sunlight on the multi-junction cells.

CPV stands for concentrator photovoltaics. A concentrating photovoltaic (CPV) system converts light energy into electrical energy in the same way that conventional photovoltaic technology does. The difference in the technologies lies in the addition of an optical system that focuses a large area of sunlight onto each cell.

Solar concentrators of all varieties may be used with the base technology either being refractive or reflective. The other primary difference is in the cells. Traditional PV systems utilize large amounts of silicon solar cells. In contrast, CPV systems utilize a small amount of high efficiency solar cell material. These cells used in high concentration CPV systems are referred to as multijunction or IIIIV cells. The CPV panels are mounted on to keep the focal point on the cell as the sun moves across the sky. CPV is sometimes confused with CSP – Concentrating Solar Power.

Whereas PV converts light energy directly to electricity, CSP systems utilize heat from the system to generate power in a traditional steam engine power plant environment.

**Description of Facilities to be constructed:**

The proposed facilities include an array of integrated high concentration photovoltaic (IHCPV) systems, which would generate approximately 10 megawatts (MW). The site would include approximately 140 units. Each system includes a 6m-tall vertical pedestal with five 15m-long, 3.2m-wide photovoltaic (PV) modules, which are mounted across a 17m-wide horizontal tube installed at the top of the pedestal. Each system typically has a 30m tracker clearance zone.

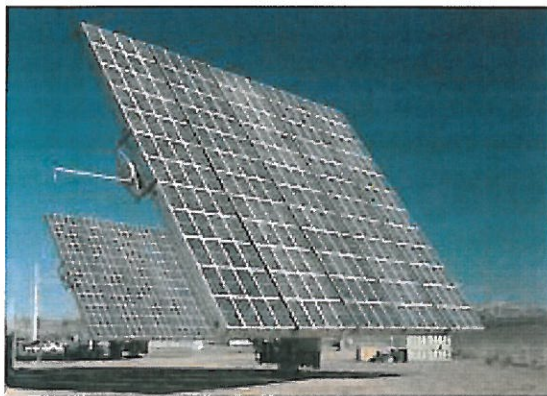
The solar arrays would be circumscribed by a perimeter fire access road. In addition to the solar arrays, the project proposes two to four concrete transformer pads, a fenced construction staging area, a maintenance shed, and a switch panel for connection to the power grid. The project site would be accessed via an existing access road.

**Construction of Transport Infrastructure (access roads etc.):**

The site can be accessed from the R31 running through Danielskuil, using existing secondary roads. However, additional temporary access roads will have to be established on site.

**Description of Construction, Operation & Maintenance including Decommissioning:**

**Construction:**



*Figure 3 –A Single CPV Unit*





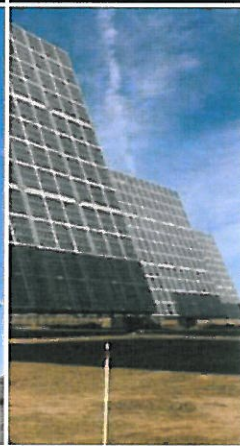


*Figure 4 –Typical CPV Facility Layout*

**Pedestals**

The pedestals are a 1 metre diameter hollow steel tube supports for the solar equipment that is embedded into the ground. The height of the pedestal would be approximately 6 metres above ground level. The embedment depth of the pedestal would depend on the quality of the site soils. A drilling company would excavate a one to one and a half-metre hole typically ranging from six to seven metres in depth and place 20cm of compacted gravel beneath the pedestal. The hole would be backfilled with concrete around the pedestal to hold it in place. A concrete footing holder would be installed above the hole and imbedded 20cm in the ground. A 1 metre diameter plate would be welded to the bottom. The ground surrounding the pedestal would be levelled and any excess dirt would be removed.

Depending on site soils, a reinforced steel cage may be installed for additional support. After drilling, the pedestal is positioned in the hole and concrete is poured around it to hold it in place.

Excavate & Install Pedestal	Install Drive Head	Add Service Cage	Lift MegaModules	Completed Unit
				
Foundation for Unit	Allows Motion to Follow Sun	Electrical & Hydraulic	CPV Modules Added	Ready to Produce Power

**Figure 5 –Illustrations of Unit components**

**Ground Assembly**

Materials for the solar arrays would be individually delivered to the site for assembly. The solar panels are attached to a large structural support, called a torque tube, which is horizontally positioned to the drive head that in turn is assembled on top of the pedestal. Smaller attachment pieces, called outriggers, on which the solar panels connect, must be installed on the torque tube before it can be placed on the pedestal; this operation would include ground pre-assembly of the outriggers onto the torque tube.

**Install Drive Head**

The drive head is a mechanical subassembly installed on top of the pedestal. The drive head provides the ability to manoeuvre the solar panels laterally (side-to-side) and vertically so that they are always perpendicular to the sun’s rays. The drive head weighs approximately 3000 kgs and would be set in place using a rough terrain crane or boom forklift. Labourers in man-lifts would align and bolt the drive head to the pedestal. The elevation actuator can be installed at this point of the installation or at a later date before the installation of the torque tube by lifting and placing the elevation actuator onto the elevation actuator mounting blocks.

**Install Torque Tube**

The torque tube is a 1m-diameter hollow steel tube that is placed horizontally on the drive head. The tube measures 17 metres in length. Three to four torque tubes can arrive on a single truck. It includes the outriggers on which the solar panels attach. The torque tube weighs in excess of 7000 kgs and will be set in place using a rough terrain crane. It will be set on top of the pedestal and welded in place. The tube has two pin connections to the drive head and one to an elevation actuator, which is the hydraulic component on the drive head.

**Solar Panels**

The solar panels fasten to the outriggers. There are seven modules per system and their approximate dimensions are 3.2 metres wide by 15 metres long. Each module weighs 1700 kgs and is connected to the supports (outriggers) on the torque tube via four bolt connections per outrigger. The solar panels would be “flown” in place using a crane and attached by labourers in man lifts. These modules would arrive by truck. Four modules can be transported per truck.



Install Cages and Encoders

The main infrastructure to the solar unit is complete after the panels are installed on the torque tube; the remaining installation includes connection of the inverter, hydraulic system, and support caging. The support caging, also called the service module, consists of a steel lattice that supports from the drive head and nearly extends to the ground. The hydraulic system, which includes an encoder that controls module movement, and the inverter are installed on the service module. A small labour crew using a forklift and a man lift would install the service module and ancillary components. The support caging would be installed at the base of the pedestal. Multiple cages can be transported on a single truck.

Site Electrical System

Development of the electrical systems would take place in conjunction with installation of the rest of the structures. In brief terms, it includes all electrical cabling and trenching (field trenching in and around the entire site where the units will be installed should take place after the installing the pedestals) that connects all solar units, collects the energy from them, and then routes it to a point of connection with the utility infrastructure system.

Access Road and Accessory Structures

This solar facility would include an unpaved road with vehicular access to each individual system. In addition, concrete transformer pads for each row of solar panels, a switch panel for connection to the power grid, and a 3m x 6m control shed would be constructed on site.

Personnel

Approximately 30 people are envisaged to be required during the construction phase, which is expected to last for 6-8 months. Positions will be filled by mostly local labour from the area where possible and are not to be housed onsite.

**Operations:**

The proposed solar arrays would track the sun and be operated either automatically or remotely. During periods of high wind or when undergoing maintenance, the solar arrays would be shifted to a stand-by mode, where the panels are placed in a horizontal position (facing upward and parallel to the ground).

Personnel

Approximately 10 workers (7 direct and 3 indirect) are envisaged to be required during the operational phase of the proposed solar development. The lifespan of the development is expected to last for +-25 years. Positions will be filled by mostly local labour from the area and are not to be housed onsite.

**Maintenance:**

Maintenance activities may entail replacing non-functioning cells or other mechanical parts essential to the operation of the arrays. However, these trips would occur on an as-needed basis. Maintenance visits may not occur immediately after a cell ceases to function or a lens becomes damaged, but rather the Project Applicant would determine whether the benefit of the maintenance trip outweighed the cost of that additional trip. It is assumed, however, that maintenance visits would occur four to six times per year. Individuals responsible for maintenance activities would most likely commute from regional offices or nearby operating facilities.

Since sunlight can be absorbed by dust and other impurities on the surface of the photovoltaic panels, washings would periodically be needed. An estimated 1000 cubic metres of water per year would be required for cleaning the photovoltaic panels.

**Decommissioning:**

The solar energy facility is expected to have a lifespan of +-25 years. The facility would only be decommissioned and the site rehabilitated once it has reached the end of its economic life. It would most likely be due to the enhancement of technology/infrastructure in the future of renewable energy. Recycling will be done as far as possible.

## 2. FEASIBLE AND REASONABLE ALTERNATIVES

**“alternatives”**, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

Describe alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Paragraphs 3 – 13 below should be completed for each alternative.

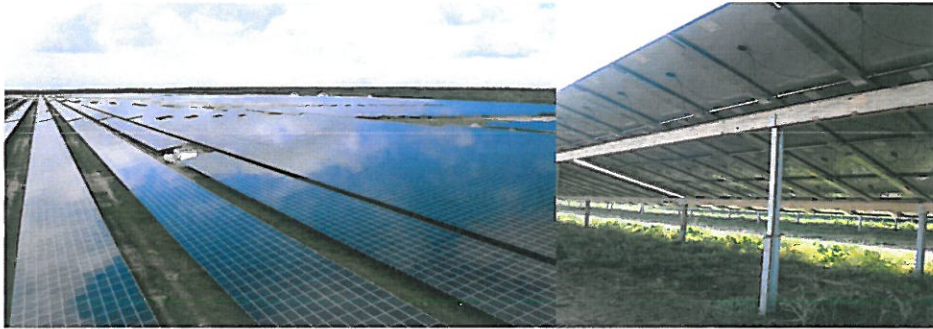
### SITE ALTERNATIVE (S1)

Erf 753 Danielskuil was identified as a suitable option for the proposed development. This investigation area is depicted in Figure 1 above. The property belongs to the Idwala Industrial Holdings (Pty) Ltd and comprises of just under 225 ha in total. The nature of the site required for renewable energy generation projects often means that assessment of site alternatives is not possible. The whole ±225ha of Erf 753, Danielskuil was taken into account and the most suitable portion of 20 Ha was identified in regards to the following specifications:

- **Size:** 20 ha area required
- **Landowner consent:** Idwala Industrial Holdings (Pty) Ltd has provided consent
- **Available access:** The site can be accessed from the R31 running through Danielskuil, using existing secondary roads. However, additional temporary access roads will have to be established on site.
- **Locality to nearest electricity grid for power evacuation:** Danielskuil sub-station is located within the site area with high voltage power lines running through a section of the site.
- **Topography:** The proposed site is located on an almost totally flat area.
- **Agricultural Potential:** The site was specifically chosen due to an area with very-low Agricultural Potential.
- **Biodiversity:** The site itself was chosen for least environmental impact: primarily the Biodiversity Assessment, which shows the site to avoid sensitive or protected species such as *Acacia erioloba* and *Acacia haematoxylon*.
- **Archaeological:** The site was specifically chosen with minimal impact on Archaeological artefacts
- **Visual:** The site is situated in an area characterized by industrial type buildings, a mine and utility land uses. The site has a high absorption capacity due to the presence of existing land uses and therefore the overall visual impact is low.

**ACTIVITY ALTERNATIVE: USE OF THE 20 HA SITE FOR PV FACILITY**

If the 20 Ha site is to utilise the conventional PV technology (for ~7 MW), the overall required components will be the same (arrays, inverters etc), but the units will be close to the ground and on fixed supports.



*Figure 6 – Illustration of conventional PV arrays, low to the ground on fixed supports*

CPV is therefore more favourable over PV by means of its higher improved efficiency of 10 MW.

**LAYOUT ALTERNATIVES:**

The preferred layout as discussed throughout this report has considered environmental sensitivities. As such the primary preferred layout has avoided these areas as far as possible.

**OPERATIONAL ALTERNATIVES:**

No feasible operating alternatives are applicable to the proposed solar energy facility.

### 3. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

List alternative sites, if applicable.

Alternative:	Latitude (S):		Longitude (E):	
Alternative S1 <sup>1</sup> (preferred or only site alternative)	28°	12.607'S	23°	33.219'E
Alternative S2 (if any)	°	'	°	'
Alternative S3 (if any)	°	'	°	'

**Alternative S1 is the same 20 Ha site for both technological alternatives**

**In the case of linear activities: NOT APPLICABLE**

### 4. PHYSICAL SIZE OF THE ACTIVITY

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:	Size of the activity:
Alternative A1 <sup>2</sup> (preferred activity alternative)	±20 Ha
Alternative A2 (if any)	m <sup>2</sup>
Alternative A3 (if any)	m <sup>2</sup>

Alternative A1 is for a Concentrating Photovoltaic (CPV) facility generating 10 MW  
 Alternative A2 is for a Photovoltaic (PV) facility generating ~5 MW

or, for linear activities: NOT APPLICABLE

Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:	Size of the site/servitude:
Alternative A1 (preferred activity alternative)	±225 Ha
Alternative A2 (if any)	m <sup>2</sup>
Alternative A3 (if any)	m <sup>2</sup>

<sup>1</sup> "Alternative S.." refer to site alternatives.

<sup>2</sup> "Alternative A.." refer to activity, process, technology or other alternatives.

**5. SITE ACCESS**

Does ready access to the site exist?

YES X	
m	

If NO, what is the distance over which a new access road will be built

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

**6. SITE OR ROUTE PLAN**

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as **Appendix A** to this document.

The site or route plans must indicate the following:

- 6.1 the scale of the plan which must be at least a scale of 1:500;
- 6.2 the property boundaries and numbers of all the properties within 50metres of the site;
- 6.3 the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
- 6.4 the exact position of each element of the application as well as any other structures on the site;
- 6.5 the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
- 6.6 all trees and shrubs taller than 1.8metres;
- 6.7 walls and fencing including details of the height and construction material;
- 6.8 servitudes indicating the purpose of the servitude;
- 6.9 sensitive environmental elements within 100metres of the site or sites including (but not limited thereto):
  - rivers;
  - the 1:100 year flood line (where available or where it is required by DWA);
  - ridges;
  - cultural and historical features;
  - areas with indigenous vegetation (even if it is degraded or invested with alien species);
- 6.10 for gentle slopes the 1metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
- 6.11 the positions from where photographs of the site were taken.

**7. SITE PHOTOGRAPHS See Appendix B**

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this form. It must be supplemented with additional photographs of relevant features on the site, if applicable.

**8. FACILITY ILLUSTRATION See Appendix C**

A detailed illustration of the activity must be provided at a scale of 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

**9. ACTIVITY MOTIVATION See Appendix D4**

**9(a) Socio-economic value of the activity**

What is the expected capital value of the activity on completion?	<b>R308.8 million</b>
What is the expected yearly income that will be generated by or as a result of the activity?	<b>R65 million</b>
Will the activity contribute to service infrastructure?	<b>NO</b>
Is the activity a public amenity?	<b>NO, but impact of facility is for public good</b>
How many new employment opportunities will be created in the development phase of the activity?	<b>30 over 6-8 months</b>
What is the expected value of the employment opportunities during the development phase?	<b>±R3 million (R2 million for 8 months)</b>
What percentage of this will accrue to previously disadvantaged individuals?	<b>40-45%</b>
How many permanent new employment opportunities will be created during the operational phase of the activity?	<b>10 (7 direct &amp; 3 indirect)</b>
What is the expected current value of the employment opportunities during the first 10 years?	<b>R8.7 million</b>
What percentage of this will accrue to previously disadvantaged individuals?	<b>56% (R4.9million)</b>

**9(b) Need and desirability of the activity**

Motivate and explain the need and desirability of the activity (including demand for the activity):

<b>NEED:</b>		
1.	Was the relevant provincial planning department involved in the application? <b>By means of the Land Use application</b>	<b>YES X</b>
2.	Does the proposed land use fall within the relevant provincial planning framework? <b>Refer to Desirability no 2 below.</b>	<b>YES X</b>
3.	If the answer to questions 1 and / or 2 was NO, please provide further motivation / explanation: <b>N/a</b>	

<b>DESIRABILITY:</b>		
1.	Does the proposed land use / development fit the surrounding area? <b>Yes, although site is located on town commonage it is amongst other industrial uses.</b>	<b>YES X</b>
2.	Does the proposed land use / development conform to the relevant structure plans, SDF and planning visions for the area?	<b>YES X</b>

**Northern Cape Provincial Spatial Development Strategy (NCSDS)**

- Economies of emerging growth centres, i.e. Upington & Springbok, are diversified (balancing downscaling of export grapes and copper mines industries with growth prospects in non-traditional sectors i.e. energy generation)
- Proximity of land reform sites to economic activities should be ideal as economic potential of land reform sites are inadequate as a source of economic livelihoods. Alternative energy generation enhances economic activity.
- Development Corridors and Special Resource Areas i.e. Orange River corridor (from Springbok through Upington to Kimberley) link the major economic centres in the province through established transport infrastructure. Alternative energy projects are examples of flagship economic development projects along transport/ development corridors and within special resource areas enhancing economic potential of development corridors.
- Stagnating Small Towns will lead to reconsideration of future service provision levels. Alternative energy generation can contribute to the local economy, making the provision of services worthwhile.

3.	Will the benefits of the proposed land use / development outweigh the negative impacts of it? <b>Yes, impacts can be mitigated.</b>	<b>YES X</b>
4.	If the answer to any of the questions 1-3 was NO, please provide further motivation / explanation: <b>N/a</b>	
5.	Will the proposed land use / development impact on the sense of place? <b>Not according to visual impact assessment. Land uses in surroundings are mixed and mainly industrial.</b>	<b>NO X</b>
6.	Will the proposed land use / development set a precedent?	<b>NO X</b>
7.	Will any person's rights be affected by the proposed land use / development? <b>No, not as far as can be established in preliminary socio economic assessment. Public participation done during the DBAR supports this conclusion.</b>	<b>NO X</b>
8.	Will the proposed land use / development compromise the "urban edge"? <b>This type of land use is usually found outside an urban edge. In this specific case it is on the municipal commonage where there is an industrial node.</b>	<b>NO X</b>
9.	If the answer to any of the question 5-8 was YES, please provide further motivation / explanation. <b>N/a</b>	

<b>BENEFITS:</b>		
1.	Will the land use / development have any benefits for society in general?	<b>YES X</b>
2.	Explain: <b>Carbon footprint will be reduced. People in general expect that the price of electricity will drop.</b>	



3.	Will the land use / development have any benefits for the local communities where it will be located?	YES X
4.	Explain: <b>Yes, but limited as local business will benefit when maintenance team visit Danielskuil and local business will supply security services.</b>	

**10. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES**

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline:	Administering authority:	Date:
National Environmental Management Act (NEMA) (Act 107 of 1998, as amended)	National Department of Environmental Affairs (DEA)	1998
National Heritage Resources Act (Act 84 of 1999)	SA Heritage Resources Agency (SAHRA)	1999
Land Use Planning Ordinance 15 of 1985	Northern Cape Planning	1985
Environmental Impact Assessment Guidelines	DEA	2010
Biodiversity Act (Act No 10 of 2004)	Dept of Environmental Affairs (DEA) (National)	2004

**11. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT**

**11(a) Solid waste management**

Will the activity produce solid construction waste during the construction/initiation phase? YES X

If yes, what estimated quantity will be produced per month? 5-10m<sup>3</sup>

How will the construction solid waste be disposed of (describe)?  
Packaging, paper, 'domestic' waste

Where will the construction solid waste be disposed of (describe)?

Registered municipal solid waste disposal facility

Will the activity produce solid waste during its operational phase? NO X

If yes, what estimated quantity will be produced per month? m<sup>3</sup>

How will the solid waste be disposed of (describe)?

N/a

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

N/a

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation? NO X

If yes, inform the competent authority and request a change to an application for scoping and EIA.

Is the activity that is being applied for a solid waste handling or treatment facility? **NO X**

If yes, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

**11(b) Liquid effluent**

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? **NO X**

If yes, what estimated quantity will be produced per month? m<sup>3</sup>

Will the activity produce any effluent that will be treated and/or disposed of on site? **NO X**

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility? **NO X**

If yes, provide the particulars of the facility:

Facility name:			
Contact person:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

<b>N/a</b>
------------

**11(c) Emissions into the atmosphere**

Will the activity release emissions into the atmosphere? **NO X**

If yes, is it controlled by any legislation of any sphere of government?  

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

<b>N/a</b>
------------

**11(d) Generation of noise**

Will the activity generate noise? **NO X**

If yes, is it controlled by any legislation of any sphere of government?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the noise in terms of type and level:

**N/a**

**12. WATER USE**

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es)

<b>Municipal</b> <b>X</b>	water board	groundwater	river, stream, dam or lake	other	the activity will not use water
------------------------------	-------------	-------------	----------------------------	-------	---------------------------------

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate

the volume that will be extracted per month:

<b>75 000</b> <b>litres</b>
<b>NO X</b>

Does the activity require a water use permit from the Department of Water Affairs?

If yes, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this application if it has been submitted.

**13. ENERGY EFFICIENCY**

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

**NOT APPLICABLE: APPLICATION FOR ENERGY GENERATION FACILITY**

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

**SECTION B: SITE/AREA/PROPERTY DESCRIPTION**

**Important notes:**

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No. (e.g. A):

2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section? 

YES X	NO
-------	----

If YES, please complete the form entitled "Details of specialist and declaration of interest"

**SEE INDIVIDUAL DECLARATIONS IN EACH SPECIALIST REPORT IN APPENDIX D**

for each specialist thus appointed:

All specialist reports must be contained in Appendix D.

Property description/physical address:

The site is located on a portion of Erf 753, Danielskuil, approximately 2.2km south-east of Danielskuil in the Northern Cape Province (refer to Figure 1). The Danielskuil sub-station is located on the site, with the Waste Water Treatment Works directly adjacent to the north and with Idwala Lime mine to the east across the R31. This portion of the Erf is partially vacant except for the Danielskuil sub-station and high voltage power lines running through a section of the site. The Property is owned by Idwala Industrial Holdings (Pty) Ltd.

(Farm name, portion etc.) Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application.

Erf 753, Danielskuil

In instances where there is more than one town or district involved, please attach a list of towns or districts to this application.

Current land-use zoning:

Agriculture 1

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

Is a change of land-use or a consent use application required?

YES X	NO
-------	----

Must a building plan be submitted to the local authority?

YES X	NO
-------	----

Locality map:

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.) The map must indicate the following:

- an indication of the project site position as well as the positions of the alternative sites, if any;
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection)

**1. GRADIENT OF THE SITE**

Indicate the general gradient of the site.

**Alternative S1:**

Flat X	1:50	–	1:20	–	1:15	–	1:10	–	1:7,5 – 1:5	Steeper than 1:5
	1:20		1:15		1:10		1:7,5			

**TOPOGRAPHY: Biodiversity Assessment; Appendix D2.**



Figure 7 – Google image indicating the slope following the boundary of the site (direction NW -SE-SW).From Fig 5 of Biodiversity Assessment; Appendix D2.

**Refer to: Biodiversity Assessment; Appendix D2.**

The proposed site is located on an almost totally flat area, with the elevation having an average slope of only 0.8%. It also shows that the site slopes very slightly from the north-west corner to the south and south-east in the direction of the Danielskuil River (situated approximately 700 m to the south and south-east of the proposed location).

**Alternative S2 (if any):**

Flat	1:50 – 1:20	1:20	–	1:15	–	1:10	–	1:7,5 – 1:5	Steeper than 1:5
		1:15		1:10		1:7,5			

**Alternative S3 (if any):**

Flat	1:50 – 1:20	1:20	–	1:15	–	1:10	–	1:7,5 – 1:5	Steeper than 1:5
		1:15		1:10		1:7,5			

**2. LOCATION IN LANDSCAPE**

Indicate the landform(s) that best describes the site:

2.1 Ridgeline

**2.2 Plateau**

2.3 Side slope of hill/mountain

2.4 Closed valley

2.5 Open valley

2.6 Plain

2.7 Undulating plain / low hills

2.8 Dune

2.9 Seafront



*Figure 8 – Photograph across the site, showing minimal slope*

### 3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

**GEOLOGY AND SOIL:** Agricultural Assessment, Appendix D1

**Land Type Soil Data:**

The site falls into the Ae9 land type (Land Type Survey Staff, 1972 - 2006). Ae9 land types denote areas with red soils of high base status that are deeper than 300 mm. The soils in the land type are therefore predominantly red and of high base status, often with a regular occurrence of calcrete. The soils are predominantly shallow and do not exhibit morphological signs of wetness at depth in the profile due to the dominance of dolomite geology. Rocky outcrops and surface rock and limestone occur frequently (Figure 9).



*Figure 9 – Land cover of the site with high voltage power lines also in view*

**Site survey soil data:**

The soil survey revealed that the site consists of shallow rocky soils dominantly of the Mispah (Orthic A-horizon / Hard Rock), Glenrosa (Orthic A-horizon / Lithocutanic B-horizon) and shallow Hutton (Orthic A-horizon / Red Apedal B-horizon) forms. The soils on the site are very homogenous in their distribution and there are no signs of drainage depression on the preferred site. The more pronounced effect on the site is the presence of salts in the soils that give a higher reflectance signature on aerial photographs. From a practical and legislative (NWA) perspective the northern most site (Alt1) is preferred for the development.



*Figure 10 – Grey soil surface due to significant long-term dust deposition with underlying natural red soil having been brought to the surface through ant activity*

The practical placement of the solar facility could be problematic in terms of the atmospheric dust loads as generated by the neighbouring activities. The dust load and settlement effect is quite visible on the soil surface in the development areas as the surface is grey (typical dolomitic lime colour) and the subsurface is red (original soil colour). The effect of ant activities illustrates this problem (Figures 10) although the deposition rates are not known.

**RIVERS AND DRAINAGE: Biodiversity Assessment: Appendix D2**

No rivers, wetlands or even drainage lines were observed on the proposed location for the solar site near Danielskuil. However, Southern Kalahari Salt Pans, which is potentially significant biodiversity features are expected to the north, south and east of the location (Refer to the blue patches in Error! Reference source not found.1).

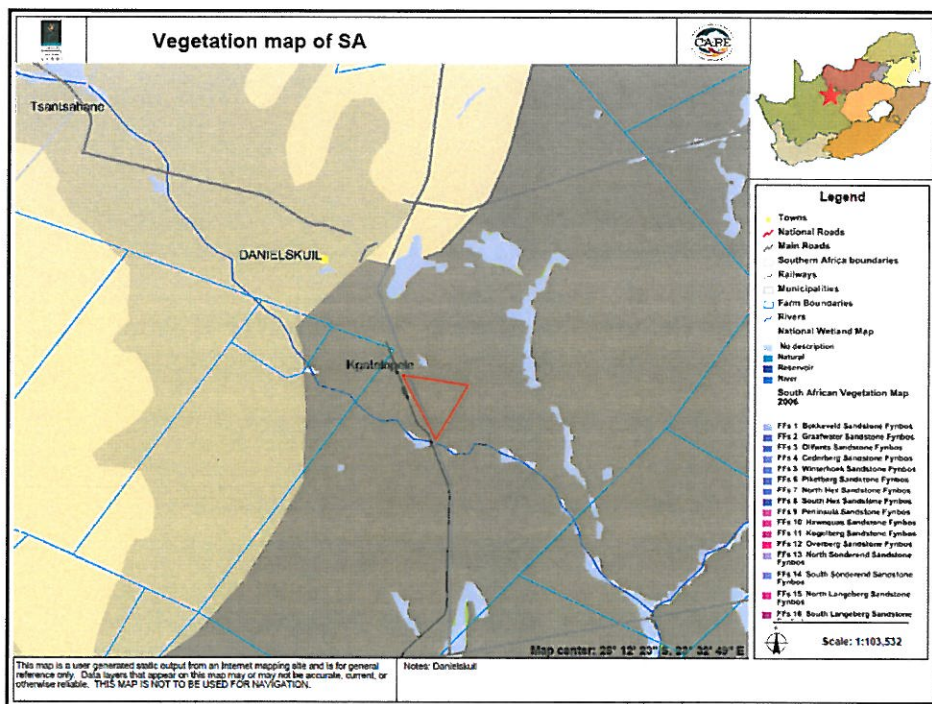


Figure 11 – Southern Kalahari Salt Pans from the vegetation map of SA, Lesotho and Swaziland (2006)

**AGRICULTURAL POTENTIAL: Agricultural Assessment, Appendix D1**

The agricultural potential of the site is **very low** due to climatic constraints as well as the dominance of shallow soils. Due to the underlying dolomite, chert and limestone and lack of water for irrigation purposes the improvement of the agricultural potential through significant inputs is considered non-viable. The grazing potential of the site is moderate but the distinct dust deposition is considered to be detrimental to such land uses. The Mn content of the dust could have detrimental effects on grazing animals' health.

Is the site(s) located on any of the following (tick the appropriate boxes)?

	Alternative S1:	Alternative S2 (if any):	Alternative S3 (if any):
Shallow water table (less than 1.5m deep)	<input type="checkbox"/> NO X	<input type="checkbox"/>	<input type="checkbox"/>
Dolomite, sinkhole or doline areas	<input type="checkbox"/> NO X	<input type="checkbox"/>	<input type="checkbox"/>



Seasonally wet soils (often close to water bodies)	<b>NO X</b>				
Unstable rocky slopes or steep slopes with loose soil	<b>NO X</b>				
Dispersive soils (soils that dissolve in water)	<b>NO X</b>				
Soils with high clay content (clay fraction more than 40%)	<b>NO X</b>				
Any other unstable soil or geological feature	<b>NO X</b>				
An area sensitive to erosion	<b>NO X</b>				

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

**4. GROUNDCOVER**

Indicate the types of groundcover present on the site:

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

<b>Natural veld - good condition (sparse; grazed)<sup>E</sup></b>	Natural veld with scattered aliens <sup>E</sup>	Natural veld with heavy alien infestation <sup>E</sup>	Veld dominated by alien species <sup>E</sup>	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an “<sup>E</sup>” is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn’t have the necessary expertise.

**VEGETATION: Biodiversity Assessment: Appendix D2**

The study area is situated next to the urban edge of the town of Danielskuil. At present it is used for natural and/or communal grazing and by Eskom for the location of a substation. The Municipal sewerage works is located just north of the larger site, while the Idwala Lime Mine is situated just across the R31 from the proposed solar site location. Natural vegetation forms a medium cover over the entire remainder of the Erf.

In accordance with the 2006 Vegetation map of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006) only one broad vegetation type is expected in the proposed area and its immediate vicinity, namely Ghaap Plateau Vaalbosveld classified as least threatened. Ghaap Plateau Vaalbosveld is found in the Northern Cape and North-West Provinces on the flat plateau from around Campbell in the south, east of Danielskuil through Reivilo to around Vryburg in the north on altitudes varying from 1 100 -1 500 m (Mucina & Rutherford, 2006).

The vegetation encountered conforms to that of Ghaap Plateau Vaalbosveld and supported a low shrub/grassy layer (up to 50 cm) with a woody/shrub over layer varying in height from 1-2.5 m (Figure 12). A third tree stratum is sometimes present in the form of *Acacia erioloba* trees, which could reach up to 4 m in height. The larger study area was fairly uniformly covered by the same vegetation composition. Vegetation cover was between 80-90%.



*Figure 12 –Natural veld in the study area (Tarchonanthus camphoratus prominent), with a single Acacia erioloba in the background*

**Endemic or Protected Species:**

Endemic taxa which might be encountered include: *Rennera stellata* and a number of biogeographically important taxa. None of these species was encountered, and although some of these species might be encountered, the area on which the solar site is to be located is far from pristine and is not expected to contribute significantly towards regional conservation targets. However, the following protected tree species in terms of the National Forest Act of 1998 (Act 84 of 1998) have a geographical distribution that may overlap with the broader study area: *Acacia erioloba*, *Acacia haematoxylon* and *Boscia albitrunca*.

During the site visit, both *Acacia erioloba* and a number of relative young *Acacia haematoxylon* were encountered distributed mostly along the eastern boundary of the property (However, *Acacia haematoxylon* is expected to be encountered throughout the site. All of the trees encountered were marked with GPS coordinates (Refer to **Error!**

**Reference source not found.** within the BIA) and plotted on a map. It was also very clear that some of these trees will be compromised if the solar plant site is to be located where proposed. However, this will be true for most of the adjoining area as well and good environmental control during construction can minimise the impact significantly.

**Invasive Alien Species:**

Most probably because of the aridity of the area, invasive alien rates are generally very low for most of this area and no problem plants were observed within the study area.

**FAUNA: Biodiversity Assessment: Appendix D2**

Since the property in question is not regarded as pristine and situated within the urban edge of Danielskuil, mammal and bird species were not regarded, as the proposed activity would not pose any additional significant impact on the species (or rather the lack of species) found or expected on the property. Although small game and bird species are still expected (and were observed), the construction of the solar facility will not have a major impact on regional biodiversity and with mitigating and good environmental control during construction the impact on these species could be minimised.

According to the Sanparks website, the nearby Mokala National Park is host to a varied spectrum of birds which adapted to the transition zone between Kalahari and Karoo biomes. Birds that can be spotted are the Kalahari species, black-chested prinia and its Karoo equivalent rufous-eared warbler as well as melodious lark. In rocky hillocks attract species such as freckled nightjar (vocal at night), short-toed rock thrush and cinnamon-breasted bunting. There are also a number of birds making use of the artificial man-made habitat around accommodations, such as mousebirds, martins, robin-chats, thrushes, canaries and flycatchers. Animal species such as Black Rhino, White Rhino, Buffalo, Tsessebe, Roan Antelope, Mountain Reedbuck, Giraffe, Gemsbok, Eland, Zebra, Red Hartebeest, Blue Wildebeest, Black Wildebeest, Kudu, Ostrich, Steenbok, Duiker and Springbok are also present in the Mokala National Park.

The nearby southern Kalahari salt pans is, however, expected to have significant species associated therewith (and although none of these salt pans was found within the site, some of them are expected just east of the solar site location). In her article about the southern Kalahari eco-region with regards to salt pans ([www.feow.org/ecoregion\\_details.php?eco=571](http://www.feow.org/ecoregion_details.php?eco=571)), Liz Day (form the freshwater consulting group) mentions that amphibian fauna are limited to hardy, opportunistic species, able to breed at virtually any time of year when water is available, and to aestivate, often over long periods of time. Species of giant bullfrog (*Pyxicephalus* spp.), for example, aestivate through the dry season in holes in the ground. Buried, they are protected from desiccation by a waxy cuticle, formed from mucus and layers of shed skin. In addition, the frogs store water in bladder-like outgrowths of their digestive tract, while their metabolic rate drops to less than one quarter of its normal resting level. Both the pans and ephemeral rivers of the southern Kalahari form focal points for the large herbivores of the eco-region, providing minerals to animals throughout the year and water during the rainy season. The pans are also used by the Kalahari fauna variously for burrowing, grazing, saltlicks, and seasonal waterholes. In addition, the trees associated with the riverbeds provide locally rare nesting and roosting habitat to birds.

**5. LAND USE CHARACTER OF SURROUNDING AREA – Refer to Appendix D3c**

Indicate land uses and/or prominent features that does currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

**5.1 Natural area**

5.2 Low density residential

5.3 Medium density residential

5.4 High density residential

5.5 Informal residential<sup>A</sup>

5.6 Retail commercial & warehousing

5.7 Light industrial

**5.8 Medium industrial<sup>AN</sup> (Lime mine located across the R31 to the west)**

5.9 Heavy industrial<sup>AN</sup>

**5.10 Power station (Onsite)**

- 5.11 Office/consulting room
- 5.12 Military or police base/station/compound
- 5.13 Spoil heap or slimes dam<sup>A</sup>
- 5.14 Quarry, sand or borrow pit
- 5.15 Dam or reservoir
- 5.16 Hospital/medical centre
- 5.17 School
- 5.18 Tertiary education facility
- 5.19 Church
- 5.20 Old age home
- 5.21 Sewage treatment plant<sup>A</sup> (Located to the north)**
- 5.22 Train station or shunting yard<sup>N</sup>
- 5.23 Railway line<sup>N</sup>
- 5.24 Major road (4 lanes or more)<sup>N</sup> (R31 to the west)**
- 5.25 Airport<sup>N</sup>
- 5.26 Harbour
- 5.27 Sport facilities
- 5.28 Golf course
- 5.29 Polo fields
- 5.30 Filling station<sup>H</sup>
- 5.31 Landfill or waste treatment site
- 5.32 Plantation
- 5.33 Agriculture (Some grazing takes place)**
- 5.34 River, stream or wetland
- 5.35 Nature conservation area
- 5.36 Mountain, koppie or ridge
- 5.37 Museum
- 5.38 Historical building
- 5.39 Protected Area
- 5.40 Graveyard
- 5.41 Archaeological site
- 5.42 Other land uses (describe)

If any of the boxes marked with an “<sup>N</sup>” are ticked, how will this impact / be impacted upon by the proposed activity?

**5.24 Major road (4 lanes or more)<sup>N</sup>** The site is bordered and accessed from the R31 running through Danielskuil to the west of the site.

Travelling east-west on the R31 before it turns north into Danielskuil, the traveller is slightly lower than the site and more than 6km away from the site. The Lime mine’s stacks are visible but the proposed solar site is screened by the low gradient variations in the landscape.

Turning north onto the R31 (Figure 13 below), the traveller becomes aware of the substation only when he is approximately 2km from the site. From this point the traveller will observe the range of infrastructure and the back of the CPV units.



*Figure 13 –R31 northbound as receptor*

As the traveller leaves town the site is in the distance and partially screened by landscape elements such as the sewage works. However as the traveller move closer to the site the site becomes more visible and as the site is passed the travellers is within 100m of the units.

The landscape is however dominated by the lime mine as well as existing substation and HV power lines (Figure 14 below). The infill of the site with CPV units is in character with the existing land use in this area.



*Figure 14 – R31 southbound as receptor*

If any of the boxes marked with an "AN" are ticked, how will this impact / be impacted upon by the proposed activity?

If YES, specify and explain:

If YES, specify:

**5.8 Medium industrial<sup>AN</sup>** The site is bordered by the WWTW bordering the site to the north.

The residential area is slightly lower than the site. Various infrastructure e.g. the sewage works screen the neighbourhood from the site (Figure 15 below). The top of units will be visible but will be in character with the existing Power line infrastructure within the view window of this neighbourhood



Figure 15 –Residential south as receptor

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity.

If YES, specify and explain:

If YES, specify:

N/a

**6. CULTURAL/HISTORICAL FEATURES**

**Refer to:**  
 Appendix D3a: Archaeological Impact Assessment  
 Appendix D3b: Paleontological Impact Assessment  
 Appendix D3c: Visual Impact Assessments  
 Appendix D4: Socio-economic Impact Assessments

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or palaeontological sites, on or close (within 20m) to the site?	<b>NO X</b>	
If YES, explain:	<div style="border: 1px solid black; height: 20px; width: 100%;"></div>	
If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.		
Briefly explain the findings of the specialist:	<div style="border: 1px solid black; padding: 5px;"> <p><b>ARCHAEOLOGICAL IMPACT ASSESSMENT (APPENDIX D3a)</b></p> <p><u>Significance:</u>                      The archaeologist believes that the probability of locating important archaeological heritage (i.e. stone artefacts) on the proposed site will be <b>LOW</b>. The reasons for this are the following:</p> <ul style="list-style-type: none"> <li>- No archaeological remains were found during the assessment of the alternative site.</li> <li>- The context of the proposed site is similar to the alternative site in that it comprises</li> </ul> </div>	

grasslands and old pastures, is degraded and in the case of Erf 753, covered by extensive Eskom infrastructure.

- There are no streams, water courses, pans or drainage channels on or near the proposed site where archaeological remains may be expected to be found.
- There are, no significant landscape or any rocky outcrops on the proposed site.
- There is virtually no surface stone covering the proposed site.
- There are no old buildings, structures or any features on the proposed site, apart from, those relating to Eskom infrastructure (transmission line servitudes, access roads, etc), which covers a large portion of the site and the surrounding landscape.
- There are no visible graves on the proposed site.
- Apart from trenches for underground cabling, limited bedrock excavations are envisaged. The solar panels will be raised above ground and mounted on small footings drilled and set into the ground. The excavations for the footings are about 1.5 m in diameter and so the actual ground disturbance will therefore be quite limited and contained

Indications are that In terms of archaeological heritage, the proposed site (Erf 753) for the Daniëlskuil solar energy farm is **not a sensitive**, vulnerable or threatened archaeological landscape

Conclusions:

No archaeological heritage remains were documented during the study of the proposed alternative site. Apart from the weathered surface dolomites in the north western corner of the property, there is virtually no surface stone on the proposed site, which has been heavily grazed.

- An Archaeological Impact Assessment of the proposed site is **not required** and no further archaeological mitigation is required.
- Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered, or exposed during construction activities, these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (SAHRA) (Att Ms MariagraziaGalimberti 021 462 4502). Burials must not be removed or disturbed until inspected by the archaeologist.

**PALEONTOLOGICAL IMPACT ASSESSMENT (APPENDIX D3b)**

Significance:

The fossil record of the Precambrian sediments of the Northern Cape has been briefly reviewed by Almond & Pether (2008). The shallow shelf and intertidal sediments of the carbonate-dominated lower part of the Ghaap Group, including the Campbell Rand Subgroups, are famous for their rich fossil biota of *stromatolites* or microbially-generated, finely laminated mounds and branching structures.

The Kogelbeen Formation features cyclical arrays of domal as well as columnar stromatolites as well as high-energy oolites and flat microbial laminites Eriksson *et al.* 2006).

The wind-blown sands mantling the Precambrian carbonates in the study area are of low palaeontological sensitivity.

The overall palaeontological sensitivity of the Daniëlskuil Roma Solar Plant study area at Daniëlskuil is assessed as **LOW**.

Conclusions:

Despite the known occurrence of stromatolites and other microbial fossils in Precambrian rocks underlying the study area, the impact of the proposed Daniëlskuil Roma solar plant development on local fossil heritage is considered to be **LOW** because:

- The fossiliferous Precambrian bedrocks are mantled here by superficial sediments (*e.g.*

wind-blown sands) of low palaeontological sensitivity. Good surface exposures of stromatolitic limestone are not present here;

- The stromatolites within the Campbell Rand Subgroup are of widespread occurrence, and can be far better studied or sampled in large quarries near Daniëlskuil and at Lime Acres, some 15 km to the SSW;
- Extensive, deep excavations into bedrock are unlikely to be involved in this sort of solar park project.

It is therefore recommended that exemption from further specialist palaeontological studies and mitigation be granted for this solar plant development.

Will any building or structure older than 60 years be affected in any way?	<b>NO X</b>
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	<b>NO X</b>

If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

**VISUAL IMPACT ASSESSMENTS (APPENDIX D3c)**

Receiving Environment:

The proposed site is situated within the urban edge zone of Danielskuil in an area characterized by industrial type buildings and large infrastructure. The larger area reflects the characteristics of a rural to urban landscape and the site is situated within this land use continuum.

The area is characterized by a flowing topography of low rises on a large plain. It is interspersed with occasional low hills. The plain area however display such a level of gradient that present a fairly high level of absorption and view is on average restricted to the immediate environment and seldom more than 5km. The human eye can observe the horizon on a perfectly flat surface up to 30km. The Danielskuil area however displays sufficient gradient variations to restrict this view significantly.

Findings:

The site is situated in an area characterized by industrial type building, mine and utility land uses. The site has a high absorption capacity due to the presence of existing land use.

The sensitive receptors namely the monument and residential areas are situated such that the exposure to the site and the intrusion level is low, thus creating a **LOW overall visual impact**.

The less sensitive receptor namely the R31 will be more exposed to the site, but the impact is in character with the surrounding and thus of **less significance**.

Due to the locality of the units on the same site as the substation, the transmission lines will have **very little additional impact** on the current land use and thus visual appearance.

The proposal does not present an unacceptable level of change to the visual environment and therefore the development can be recommended.

**SOCIO-ECONOMIC IMPACT ASSESSMENTS (APPENDIX D4)**

Impacts that may cause changes to the economic and material wellbeing of the community are:

- (i) Job creation
- (ii) Skills development
- (iii) Increase in Sales volume



- (iv) Increase in GGP
- (v) Growth in Tourism

All the above impacts are **positive**, but because of their positive result these impacts causes secondary impacts that may be negative. The significance of these impacts and how the secondary impacts can be mitigated to amplify the significance of these impacts should be assessed in the socio-economic impact assessment.

Impacts that may cause changes in the living environment of the community are:

- (i) Increased traffic
- (ii) Increased demand for Health, Safety
- (iii) Increase demand for Housing and Municipal services
- (iv) Changing the sense of place

All the above impacts are **negative**, but mitigation can turn these impacts and their secondary impact to be **positive** as most of the impacts appear to be of **low or negligible significance**. These impacts and secondary impacts and how they can be mitigated have to be assessed particularly in the operational phase as the other impact of the other phases are short term.

Impacts that may cause changes in the health and social wellbeing of the community are

- (i) Increased dust and noise
- (ii) Deterioration of bio-physical environment
- (iii) Trespassing & crime
- (iv) Ceasing of farming activities

All the above impacts are negative however **negligible**. However as these impacts have long term effects, they should be assessed in the socio-economic impact assessment.

SECTION C: PUBLIC PARTICIPATION

PLEASE REFER TO APPENDIX E FOR ALL PPP FOLLOWED

1. ADVERTISEMENT

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by—

- (a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the competent authority) at a place conspicuous to the public at the boundary or on the fence of—
  - (i) the site where the activity to which the application relates is or is to be undertaken; and
  - (ii) any alternative site mentioned in the application;
- (b) giving written notice to—
  - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
  - (v) the municipality which has jurisdiction in the area;
  - (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
  - (vii) any other party as required by the competent authority;
- (c) placing an advertisement in—
  - (i) one local newspaper; or
  - (ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
- (d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or local municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in subregulation 54(c)(ii); and
- (e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to—

- (i) illiteracy;
- (ii) disability; or
- (iii) any other disadvantage.

## 2. CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:

- (a) indicate the details of the application which is subjected to public participation; and
- (b) state—
  - (i) that the application has been submitted to the competent authority in terms of these Regulations, as the case may be;
  - (ii) whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental authorisation;
  - (iii) the nature and location of the activity to which the application relates;
  - (iv) where further information on the application or activity can be obtained; and
  - (iv) the manner in which and the person to whom representations in respect of the application may be made.

## 3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for all alternatives.

**Summary of Public Participation Undertaken (See Appendix E for copies of material)  
(E1 for Initial PP E2 for PP at D-BAR phase and E3 for current F-BAR phase)**

The application was advertised in Die Volksblad on 23 February, 2012, with commenting period to 16 March 2012.

An A2 on-site poster showing the application was affixed on the property fence as required.  
A3 posters were placed at the Municipal building in Danielskuil

Maildrops were delivered to the closest residential area and businesses, (shown on Google image in Appendix E viii)

Invitations to comment on the application were sent to the list of I&APs and Authorities shown on Appendix E i)

No comments were received in the Initial PP, thus the Comments and Responses Report in Appendix E1/2/ is blank.

The Draft Basic Assessment Report (DBAR) was distributed to all registered I&APs and Authorities (See Appendix E2). This Final BAR is being distributed to all on the List in Appendix E3 A.

Two comments were received on the DBAR: Control measures put forward by Eskom have been included in the EMP and concerns of the DAFF Dept of Agriculture Forestry & Fisheries are answered re process and setback lines in the Comments and Response report (Appendix E3 B2).

**4. DETERMINATION OF APPROPRIATE MEASURES**

The practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate. Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

**5. COMMENTS AND RESPONSE REPORT**

The practitioner must record all comments and respond to each comment of the public before the application is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to this application. The comments and response report must be attached under Appendix E3.

**6. AUTHORITY PARTICIPATION**

**Please note that a complete list of all organs of state and or any other applicable authority with their contact details must be appended to the basic assessment report or scoping report, whichever is applicable.**

Authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input.

**List of authorities informed: (See Appendix E)**

<b>Please refer to Appendix E (i) for list of Authorities notified, with contact detail as well as proof of letters send.</b>	
Dept. Environmental and Nature Conservation NC	The Director
NC Dept. Agricultural & Land reform	The Head of Department
Dept. of Water affairs - Northern Cape (DWAF)	Mr. LJ Snyders
SA Heritage and Resources Agency SARHA	The Provincial Manager
Eskom North West Region	Mr. Francois Retief
Eskom	Mr. Kevin Leask
Department of Mineral & Energy	Mr. Enib Babuseng
SANRAL - N Cape	Ms. Colene Runkel
South African Civilian Aviation Authority	Ms. Lizell Stroh
South African Heritage and Resources Agency	Ms. Mary Leslie
Dept. of Transport, Roads & Public Works	Mr. David Rooi
Agric, Land Reform and Rural Development	Mr. Ali Diteme
NC - Economic Development	Mr. P Seboko
Dept. Of Agriculture, Forestry & fisheries	Ms. Anneliza Collet
Dept. Of Agriculture, Forestry & Fisheries	Ms. J Mans
NC Dept. Housing and Local Government	Mr. Schalk Grobbelaar
Dept of Environmental Affairs	The Directorate

List of authorities from whom comments have been received:

Please refer to Appendix E for a full list of I&AP's registered.

One comment was received from the Department of Agriculture, Forestry & Fisheries, being mainly concerned about the potential impact on protected tree species. Please refer to the comments and response report (Appendix E3 B2).

Control measures put forward by Eskom (mainly requirements with regards to work in or near Eskom servitudes (Appendix E3).

## 7. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for linear activities, or where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable.

Has any comment been received from stakeholders?

<input type="checkbox"/>	<input checked="" type="checkbox"/> NO X
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If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

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**SECTION D: IMPACT ASSESSMENT**

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

**1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES**

List the main issues raised by interested and affected parties.

Please refer to Appendix E for a full list of I&AP's registered.

One comment was received from the Department of Agriculture, Forestry & Fisheries, being mainly concerned about the potential impact on protected tree species. Please refer to the comments and response report (Appendix E3 B2).

Control measures put forward by Eskom (mainly requirements with regards to work in or near Eskom servitudes (Appendix E3).

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached to this report as Annexure E):

Please refer to the Comments & Response Report attached under Annexure E)

**2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES**

List the potential direct, indirect and cumulative property/activity/design/technology/operational alternative related impacts (as appropriate) that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed.

**Alternative S1 (preferred alternative):**

***DIRECT IMPACTS:***

**SOIL DEGRADATION – APPENDIX D1**

Construction related activities: Physical degradation of the surface area due to:

- Solar Panel stands – **LOW** – Mitigation: Keep footprint to minimum
- Buildings and infrastructure – **LOW** – Mitigation: Keep footprint to minimum
- Roads – **LOW** – Mitigation: Keep footprint to minimum and stay on designated roads
  
- Erosion – Mitigation – Plan and implement adequate erosion control measures, with adequate soil stabilization

Operational related activities: Physical degradation of the surface

- Vehicle operations onsite – **LOW** – Mitigation: Stay on designated roads, prevent and contain spills

- Dust – **LOW** – Mitigation: Stay on designated roads and construct proper access roads

#### **BIODIVERSITY IMPACTS – APPENDIX D2**

Direct loss of vegetation type and associated habitat due to construction and operational activities.

- Loss of ecological processes (e.g. migration patterns, pollinators, river function etc.) due to construction and operational activities.
- Loss of local biodiversity and threatened plant species
- Loss of ecosystem connectivity

Even if all of the 20 ha is transformed (such as for intensive cultivation), the impact on the specific vegetation type would most probably only be **medium-low** as a result of the status of the vegetation and the location of the final proposed solar location. However, with mitigation the impact can be much reduced to an **INSIGNIFICANT** rating. Development without mitigation = 31% Significance rating and Development with mitigation = 6% Significance (Where values of  $\leq 15\%$  indicate an insignificant environmental impact and values  $>15\%$  constitute ever increasing environmental impact).

#### Mitigation measures:

- Permits must be obtained for the removal of any protected trees. In addition placement of the pylons and access roads should consider these species in order to minimise the impact there-off on these species.
- Any significant plant species that may be encountered must be identified and located (e.g. *Acacia erioloba* and *Acacia haematoxylon*) and all efforts made to avoid damage to such species.
- Only existing access roads should be used for access to the terrain (solar site).
- The internal network of service roads (if needed) must be carefully planned to minimise the impact on the remaining natural veld on the site. The number of roads should be kept to the minimum and should be only two-track/twee spoor roads (if possible). The construction of hard surfaces should be minimised or avoided.
- Access roads and the internal road system must be clearly demarcated and access must be tightly controlled (deviations may not be allowed).
- Indiscriminate clearing of areas must be avoided, only pylon sites and sites where associated infrastructure needs to be placed must be cleared (all remaining areas to remain as natural as possible).
- All topsoil (at all excavation sites) must be removed and stored separately for re-use for rehabilitation purposes. The topsoil and vegetation should be replaced over the disturbed soil to provide a source of seed and a seed bed to encourage re-growth of the species removed during construction.
- Once the construction is completed all further movement must be confined to the access tracks to allow the vegetation to re-establish over the excavated areas.

#### **ARCHAEOLOGICAL IMPACTS – APPENDIX D3a**

No archaeological heritage remains were documented during the study of the proposed alternative site. Apart from the weathered surface dolomites in the north western corner of the property, there is virtually no surface stone on the proposed site, which has been heavily grazed.

Indications are that In terms of archaeological heritage, the proposed site (Erf 753) for the Danielskuil solar energy farm is **not a sensitive**, vulnerable or threatened archaeological landscape

#### Mitigation measures:

- An Archaeological Impact Assessment of the proposed site is **not required** and no further archaeological mitigation is required.
- Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered, or exposed during construction activities, these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (SAHRA) (Att Ms MariagraziaGalimberti 021 462 4502). Burials must not be removed or disturbed until inspected by the archaeologist.

#### **PALEONTOLOGICAL IMPACT ASSESSMENT – APPENDIX D3b**

Despite the known occurrence of stromatolites and other microbial fossils in Precambrian rocks underlying the study area, the impact of the proposed Danielskuil Roma solar plant development on local fossil heritage is considered to be **LOW**

because:

- The fossiliferous Precambrian bedrocks are mantled here by superficial sediments (e.g. wind-blown sands) of low palaeontological sensitivity. Good surface exposures of stromatolitic limestone are not present here;
- The stromatolites within the Campbell Rand Subgroup are of widespread occurrence, and can be far better studied or sampled in large quarries near Daniëlskuil and at Lime Acres, some 15 km to the SSW;
- Extensive, deep excavations into bedrock are unlikely to be involved in this sort of solar park project.

Mitigation measures:

- It is therefore recommended that exemption from further specialist palaeontological studies and mitigation be granted for this solar plant development.
- Should any substantial fossil remains (e.g. vertebrate bones and teeth, shells, petrified wood) be encountered during excavation, however, these should be reported to SAHRA for possible mitigation by a professional palaeontologist.

#### VISUAL IMPACT ASSESSMENTS – APPENDIX D3c

Construction Phase:

During construction, various large earth moving equipment and equipment will be transported to the site and work on the site. This will impact on the general experience of viewers. This impact is however temporary and not uncommon during construction of infrastructure. Communities have fairly high tolerance levels for such activities if it contributes to the infrastructure of the area. Rating: **LOW**

Operational Phase:

The sensitive receptors namely the monument and residential areas are situated such that the exposure to the site and the intrusion level is low, thus creating a **LOW** overall visual impact.

The less sensitive receptor namely the R31 will be more exposed to the site, but the impact is in character with the surrounding and thus of **less significance**.

Due to the locality of the units on the same site as the substation, the transmission lines will have very little additional impact on the current land use and thus visual appearance.

The proposal does not present an unacceptable level of change to the visual environment and therefore the development can be recommended.

Mitigation measures:

The level of visual impact is of such level that no mitigation to the proposed on-site development elements necessary, but in order to avoid any potential glare impacts of the R31 southbound, it can be considered to provide a soft screening along the road of height between 1,2 -1,8m.

#### SOCIO-ECONOMIC IMPACTS (APPENDIX D4)

Impacts that may cause changes to the economic and material wellbeing of the community are:

- Job creation
- Skills development
- Increase in Sales volume
- Increase in GGP
- Growth in Tourism

All the above impacts are **positive**, but because of their positive result these impacts causes secondary impacts that may be negative. The significance of these impacts and how the secondary impacts can be mitigated to amplify the significance of these impacts should be assessed in the socio-economic impact assessment.

Impacts that may cause changes in the living environment of the community are:

- Increased traffic
- Increased demand for Health, Safety



- Increase demand for Housing and Municipal services
- Changing the sense of place

All the above impacts are **negative**, but mitigation can turn these impacts and their secondary impact to be **positive** as most of the impacts appear to be of **low or negligible significance**. These impacts and secondary impacts and how they can be mitigated have to be assessed particularly in the operational phase as the other impact of the other phases are short term.

Impacts that may cause changes in the health and social wellbeing of the community are

- Increased dust and noise
- Deterioration of bio-physical environment
- Trespassing & crime
- Ceasing of farming activities

All the above impacts are negative however **negligible**. However as these impacts have long term effects, they should be assessed in the socio-economic impact assessment.

#### **INDIRECT IMPACTS:**

Very few indirect impacts are associated with the establishment of the solar facility (e.g. little water will be used, no waste material or pollution will be produced through the operation of the facility).

The only indirect impact resulting from the construction and use of the facility is a loss of movement from small game and other mammals, since the property will be fenced. However, it is not considered to result in any major or significant impact on the area as a whole. Rating: **LOW**

#### **CUMULATIVE IMPACTS:**

##### **Biodiversity Impacts – Appendix D2**

Ghaap Plateau Vaalbosveld is classified as “Least Threatened, thus the vegetation itself is not considered to belong to a threatened or protected ecosystem. No special habitats were encountered on site (e.g. quartz patches or broken veld), which could sustain significant smaller ecosystems.

Even if all of the 20 ha is transformed (such as for intensive cultivation), the impact on the regional status of this vegetation type and associated biodiversity features would likely still be only **MEDIUM-LOW**. No irreversible species-loss, habitat-loss, connectivity or associated impact can be foreseen from locating and operating the solar facility on the final proposed solar site. However, all mitigation measures should still be implemented in order to further minimise the impact of the construction and operation of the facility.

#### **NO-GO ALTERNATIVE**

**There will be none of the activity based impacts for the No-Go alternative, but neither any of the benefits**

##### **Biodiversity Impacts – Appendix D2**

During the impact assessment the “No-Go alternative” **does not signify significant** biodiversity gain or loss especially on a regional basis. In this case the no-go options will only ensure that the *status quo* remains, but it is expected that urban creep will anyway impact on the proposed final solar site location over time.

The site visit and desktop studies described and evaluated in this document led to the conclusion that the “No-Go” alternative **will not result in significant gain** in regional conservation targets, the conservation of rare & endangered species or gain in connectivity. At the best the No-Go alternative will only support the “*status quo*” of the region. On the other hand the pressure on Eskom facilities, most of which are currently still dependant on fossil fuel electricity generation, will remain. Solar power is seemingly a much cleaner, biodiversity friendly, and more sustainable long term option for electricity production.

### 3. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

#### Alternative S1 (preferred alternative)

This section provides a summary of the assessment and conclusions drawn for the proposed Danielskuil solar energy facility. There are no significant negative impacts associated with the CPV 10 MW or PV ~7 MW proposals for the 20 Ha site.

The overall impact on **soil and agricultural potential** is of **LOW significance** with the implementation of the recommended mitigation measures. The proposed development will not have large impacts due to the low agricultural potential of the site. The potential exists to increase the grazing potential of the site through additional shade provided by the solar panels as well as the harvesting of rainwater on the site through the use of dedicated storm water mitigation and management measures. However, erosion is considered to be a risk and it must be controlled through adequate mitigation and control structures. Furthermore impacts from vehicles, such as spillages of oil and hydrocarbons, should be prevented and mitigated. Lastly dust generation on site should be mitigated and minimised as the dust can negatively affect the quality the surrounding environment and can contribute to dust loads from surrounding land uses. Therefore, in perspective, the impacts of the proposed facility can be motivated as necessary in decreasing the impacts in areas where agricultural potential plays a more significant role.

The overall impact on **biodiversity** is of **LOW** significance with the implementation of appropriate mitigation measures. From the information discussed in the BAR it is clear to see that the Danielskuil final location was relatively well chosen from a biodiversity viewpoint. Even if all of the 20 ha is transformed (such as for intensive cultivation), the impact on the specific vegetation type would most probably only be medium-low as a result of the status of the vegetation and the location of the final proposed solar location. However, with mitigation the impact can be much reduced to a **VERY-LOW** significance rating. Development without mitigation = 31% Significance rating and Development with mitigation = 6% Significance (Where values of ≤15% indicate an insignificant environmental impact and values >15% constitute ever increasing environmental impact). No irreversible species-loss, habitat-loss, connectivity or associated impact can be foreseen from locating and operating the solar facility on the final proposed solar site. Developers should however take care to minimise disturbance along the drainage lines specifically and to keep overall footprints to a minimum.

The overall **heritage** impact is of **LOW significance** with the implementation of mitigation measures. The study has identified no significant impacts to pre-colonial archaeological material that will need to be mitigated prior to development activities commencing. No further archaeological mitigation is required. Should any unmarked human burials/remains or ostrich eggshell water flask caches however be uncovered, or exposed during construction activities, these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (SAHRA) (Att Ms Mariagrazia Galimberti 021 462 4502). Burials must not be removed or disturbed until inspected by the archaeologist.

The overall **visual** impact is predominantly **LOW significance** with the implementation of appropriate mitigation measures. The construction and operational phases will have a visual impact on the environment especially onsite, but limited. The sensitive receptors namely the monument and residential areas are situated such that the exposure to the site and the intrusion level is low, thus creating a **LOW** overall visual impact. The less sensitive receptor namely the R31 will be more exposed to the site, but the impact is in character with the surrounding and thus of **less significance**. Due to the locality of the units on the same site as the substation, the transmission lines will have very little additional impact on the current land use and thus visual appearance. The proposal does not present an unacceptable level of change to the visual environment and therefore the development can be recommended. Furthermore the

facility has an advantage over other more conventional power generating plants (e.g. coal-fired power stations). The facility utilises a renewable source of energy (considered as an international priority) to generate power and is therefore generally perceived in a more favourable light. It does not emit any harmful by-products or pollutants and is therefore not negatively associated with possible health risks to observers

The establishment of the facility will have **positive benefits** as the integration of an additional 10 MW may alleviate the pressure on the local grid to a small extent and would contribute (albeit small) to the national target for renewable energy. Therefore, based on the findings of the studies undertaken, in terms of environmental constraints identified through the initial Environmental Basic Assessment process, no environmental fatal weaknesses were identified with the establishment of the proposed Danielskuil Solar Energy Facility and associated infrastructure.

It is therefore recommended that the project should be authorised. However, a number of issues requiring mitigation have been highlighted. Environmental specifications for the management of these issues / impacts are detailed within the draft Environmental Management Programme (EMP) included within Appendix F.

The following summary of impact ratings have been given in accordance to the specialist studies, as explained above compiled after mitigation:

### **NEGATIVE IMPACTS:**

- **AGRICULTURE:** Low
- **BIODIVERSITY:** Very-low
- **ARCHAEOLOGICAL:** Low
- **PALAEONTOLOGICAL:** Low
- **VISUAL:** Low

### **POSITIVE IMPACTS:**

- **SOCIO-ECONOMIC:** Positive

### **OVERALL IMPACT: LOW**

### **NO-GO OPTION:**

In this scenario the potential positive and negative environmental and social impacts as described in this Basic Assessment Report will not occur and the status quo will be maintained

Should the project not proceed, the contribution of up to 10 MW from this project towards the Government target for **renewable energy** will not be realised. As a result the potential local and regional socio-economic and environmental benefits expected to be associated with the proposed project would not be realised. These include:

- **Increased energy security:** The current electricity crisis in South Africa highlights the significant role that renewable energy can play in terms of power supplementation. In addition, given that renewables can often be deployed in a decentralised manner close to consumers, they offer the opportunity for improving grid strength and supply quality, while reducing expensive transmission and distribution losses. In addition the proposed facility will increase electricity security for the local Danielskuiltown during the day.
- **Exploitation of our significant renewable energy resource:** At present, valuable national resources including biomass by-products, solar radiation and wind power remain largely unexploited. The use of these energy flows will strengthen energy security through the development of a diverse energy portfolio.
- **Pollution reduction:** The releases of by-products through the burning of fossil fuels for electricity generation have a particularly hazardous impact on human health and contribute to ecosystem degradation.
- **Support for international agreements:** The effective deployment of renewable energy provides a tangible means for South Africa to demonstrate its commitment to its international agreements under the Kyoto Protocol, and for cementing its status as a leading player within the international community
- **Employment creation:** The sale, development, installation, maintenance, and management of renewable energy

facilities have significant potential for job creation in South Africa.

- Acceptability to society: Renewable energy offers a number of tangible benefits to society including reduced pollution concerns, improved human, and ecosystem health.
- Support to a new industry sector: The development of renewable energy offers the opportunity to establish a new industry within the South African economy.

Within a policy framework, the development of renewable energy in South Africa is supported by the White Paper on Renewable Energy (November 2003), which has set a target of 17MW renewable energy contributions to final energy generation mix by 2030. The target is to be achieved primarily through the development of solar, biomass, solar and small-scale hydro. The 'no-go' alternative will not assist the South African government in addressing climate change, in reaching the set targets for renewable energy, nor will it assist in supplying the increasing electricity demand within the country. The 'no-go' alternative is therefore not a viable alternative.

**SECTION E. RECOMMENDATION OF PRACTITIONER**

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?

YES	
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If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

**RECOMMENDED MITIGATIONS**

The mitigation, management measures and recommendations listed in this Basic Assessment Report for construction and operational phases should be implemented in order to minimise potential environmental impacts. The following additional mitigation measures should also be implemented.

**General**

- All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must be developed by a suitably experienced Environmental Assessment Practitioner.
- A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase of the solar plant in terms of the EMP and the Biodiversity study recommendations as well as any other conditions which might be required by the Department of Environmental Affairs.
- An integrated waste management system must be implemented during the construction phase.
- All rubble and rubbish (if applicable) must be collected and removed from the site to a suitable registered waste disposal site.
- All alien vegetation should be removed from the property, as is legally required (if applicable)
- Adequate measures must be implemented to ensure against erosion.
- An application for all permits with respect to protected tree species or protected plant species need to be submitted to the relevant authority prior to the commencement of construction activities.
- All declared aliens must be identified and managed in accordance with the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983), the implementation of a monitoring programme in this regard is recommended.
- Before development can continue the regions need to be checked for the presence of bird nesting sites, particularly those of ground nesting species.
- Areas of prime reptile habitat (e.g. extensive areas of flat rock, boulders fields) should be avoided. Reptiles present on the study site could potentially also be trapped and translocated.
- Limit construction, maintenance, and inspection activities to dry periods.
- Develop emergency maintenance operational plan to deal with any event of contamination, pollution, or spillages, particularly in riparian areas.

**Site specific Mitigations**

- Pylons should be placed at least 32 m away from any of the main watercourses on the property. Care should also be taken to protect drainage lines (by controlling the pylon placement).
- All significant plant species should be identified (e.g. *Acacia erioloba*) and all efforts made to avoid damage to such species.
- Only existing access roads should be used for access to the terrain (solar site).
- The internal network of service roads (if needed) must be carefully planned to minimise the impact on the remaining natural veld on the site. The number of roads should be kept to the minimum and should be only two-track/ twee-spoor roads (if possible). If possible the construction of hard surfaces should be avoided.
- Access roads and the internal road system must be clearly demarcated and access must be tightly controlled (deviations must not be allowed).

BASIC ASSESSMENT REPORT: DANIELSKUIL ROMA: FINAL

- Indiscriminate clearing of areas must be avoided, only pylon sites and sites where associated infrastructure needs to be placed must be cleared (all remaining areas to remain as natural as possible).
- All topsoil (the top 15-20 cm at all excavation sites), must be removed and stored separately for re-use for rehabilitation purposes. The topsoil and vegetation should be replaced over the disturbed soil to provide a source of seed and a seed bed to encourage re-growth of the species removed during construction.
- Once the construction is completed all further movement must be confined to the access tracks to allow the vegetation to re-establish over the excavated areas.
- Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered, or exposed during construction activities, these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (SAHRA) (Att Ms Mariagrazia Galimberti 021 462 4502). Burials must not be removed or disturbed until inspected by the archaeologist.
- Should any substantial fossil remains (e.g. vertebrate bones and teeth) be encountered during excavation, however, these should be reported to SAHRA for possible mitigation by a professional palaeontologist.
- **All mitigations and recommendations from the specialists above must be adhered to.**

Is an EMPr attached?	<b>YES X</b>
The EMPr must be attached as Appendix F.	

**SECTION F: APPENDIXES**

Appendix A: Site plan(s)

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports

Appendix D1 Agricultural

Appendix D2 Biodiversity

Appendix D3 Heritage

Appendix D3a Archaeological

Appendix D3b Palaeontological

Appendix D3c Visual

Appendix D4 Socio-Economic

Appendix E: Comments and responses report (iii in + Public Participation Material)

Appendix E1 Initial Public Participation

Appendix E2 Draft BAR Public Participation

Appendix E3 Final BAR Public Participation + Comments & Response Report

Appendix F: Environmental Management Programme (EMPr)