

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS
AMENDED FINAL SCOPING REPORT

PROPOSED SAN SOLAR ENERGY FACILITY
& ASSOCIATED INFRASTRUCTURE ON A
SITE NEAR KATHU, NORTHERN CAPE

(DEA Ref No: 14/12/16/3/3/2/273)

AMENDED FINAL SCOPING
REPORT

Prepared for:

San Solar Energy Facility (Pty) Ltd

7 West Quay Road

1st Floor, Block 106A

Cape Town

8000

Prepared by:

Savannah Environmental Pty Ltd

UNIT 606, 1410 EGLIN OFFICE PARK
14 EGLIN ROAD, SUNNINGHILL, GAUTENG

PO BOX 148, SUNNINGHILL, 2157

TEL: +27 (0)11 234 6621

FAX: +27 (0)86 684 0547

E-MAIL: INFO@SAVANNAHSA.COM

WWW.SAVANNAHSA.COM



PROJECT DETAILS

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Amended Final Scoping Report: Proposed San Solar Energy Facility & Associated Infrastructure on a site near Kathu, Northern Cape

Authors : Savannah Environmental (Pty) Ltd
Sanusha Govender, John von Mayer & Karen Jodas

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PURPOSE OF THE SCOPING REPORT

San Solar Energy Facility (Pty) Ltd is proposing the establishment of a commercial solar energy facility and associated infrastructure on the remaining extent of the farm Wincanton 472, which lies approximately 16 km northwest of Kathu in the Northern Cape. The solar energy facility is proposed to accommodate several arrays of **photovoltaic (PV) panels** with a combined generation capacity of 75 MW (91 MW installed capacity) and associated infrastructure on a <500ha portion of the proposed site.

This Scoping Report represents the outcome of the Scoping Phase of the EIA process and contains the following sections:

- » **Chapter 1** provides background to the project and the environmental impact assessment
- » **Chapter 2** provides an overview of the project, describes solar energy as a power option and describes the activities associated with the project (project scope)
- » **Chapter 3** outlines the process followed during the Scoping phase of the project
- » **Chapter 4** describes the existing biophysical and socio-economic environment
- » **Chapter 5** provides an evaluation of the potential issues associated with the proposed project
- » **Chapter 6** presents the conclusions of the scoping study
- » **Chapter 7** describes the Plan of Study for EIA

The Scoping Phase of the EIA process identifies potential issues associated with the proposed project, and defines the extent of the studies required within the EIA Phase. The EIA Phase will address those identified potential environmental impacts and benefits associated with all phases of the project including design, construction and operation, and recommends appropriate mitigation measures for potentially significant environmental impacts.

The release of a draft Scoping Report provides stakeholders with an opportunity to verify that the issues they have raised to date have been captured and adequately considered within the study. The Final Scoping Report incorporated all issues and responses prior to submission to the National Department of Environmental Affairs (DEA), the decision-making authority for the project. This amended Final Scoping Report includes additional information requested by DEA following a review of the Final Scoping Report submitted in April 2012. An opportunity has been provided for all registered I&APs to submit comment on the amended Final Scoping Report directly to DEA for their consideration.

EXECUTIVE SUMMARY

Background and Project Overview

San Solar Energy Facility (Pty) Ltd is proposing the establishment of a commercial solar energy facility and associated infrastructure on the remaining extent of the farm Wincanton 472, which lies approximately 16 km northwest of Kathu in the Northern Cape.

The solar energy facility is proposed to accommodate several arrays of photovoltaic (PV) panels and associated infrastructure on a <500ha portion of the proposed site. The proposed development area is preferred due to the following site characteristics:

- » Climatic conditions: Climatic conditions determine the economic viability of a solar energy facility as it is directly dependent on the annual direct solar irradiation values for a particular area;
- » Orographic conditions: The site conditions are optimum for a development of this nature;
- » Extent of the site: Significant land area is required for the proposed development; and
- » Proximity: This site is in close proximity to an existing electricity grid connection, which minimises the need for a long connection power line.

The nature and extent of this facility, as well as potential environmental

impacts associated with the construction, operation and decommissioning phases are explored in more detail in this Final Scoping Report.

The solar energy facility proposes to generate 75 MW of electricity (91 MW installed capacity). The facility will comprise of PV panels and associated infrastructural requirements which will include:

- » A single substation and overhead power line to facilitate the connection between the solar energy facility and the Eskom electricity grid.
- » Internal access roads.
- » Gate house and security.
- » Warehouse.
- » Canteen and change rooms.
- » Office and Control centre.

This Final Scoping Report is aimed at detailing the nature and extent of this facility, identifying potential issues associated with the proposed project, and defining the extent of studies required within the EIA. This was achieved through an evaluation of the proposed project, involving the project proponent, and a consultation process with key stakeholders that included both relevant government authorities and interested and affected parties (I&APs). In accordance with the requirements of the EIA Regulations, feasible project-specific alternatives (including the "do nothing" option) have been

identified for consideration within the EIA process.

Environmental Impact Assessment

In terms of sections 24 and 24D of NEMA, as read with the EIA Regulations of GN R543 (Regulations 26-35) and R545, a Scoping Study and EIA are required to be undertaken for this proposed project.

The scoping phase for the proposed project forms part of the EIA process and has been undertaken in accordance with the EIA Regulations. This **Final Scoping Report** aimed to identify and describe potential environmental impacts associated with the proposed project and to define the extent of the specialist studies required within the EIA process. This was achieved through an evaluation of the proposed project involving specialists (with expertise relevant to the nature of the project and the study area), the project proponent, as well as a consultation process with key stakeholders (including relevant government authorities) and interested and affected parties (I&APs).

Evaluation of the Proposed Project

The potentially significant issues related to the construction of the proposed facility include:

- » Impacts on flora, fauna, and ecology resulting from activities such as site clearance and

levelling for installation of the facility components and associated infrastructure. This is attributed to parts of the study area having high ecological sensitivity (i.e. pans), including potentially sensitive plant and animal species of conservation concern that may be present on the site. Soil erosion, loss or degradation through site clearance and levelling for installation of the facility components and associated infrastructure (including the internal access roads and the power line).

- » Impact on heritage sites through construction activities.
- » Visual impacts on the landscape related to the construction site and the construction of internal access roads and the power line.
- » Socio-economic impacts, both positive (job creation and skills development) and negative (impacts associated with construction workers in the area and an influx of job seekers into the area).
- » The potential for cumulative impacts on the environment (positive and negative) associated with the construction of numerous facilities in the area. These potential impacts relate to loss of vegetation, impacts on soils and impacts on the social environment (in terms of job creation, skills development, etc.).

The potentially significant issues related to the operation of the proposed facility include:

- » Impacts on flora, fauna and ecology – including impacts on threatened bird species (i.e. through interactions with the power line), impacts on run-off and drainage patterns (i.e. this may occur where the infiltration rates of the landscape has been changed due to the presence of an impermeable surface such as the access roads).
- » Soil erosion and loss - Wind erosion in disturbed areas where soil is loosened will probably be the more common form of erosion due to the low precipitation in this region. This would affect the ecosystems operating in the soil and the plant and animal species that depend on it for growth and survival. Furthermore, accelerated loss of sediment cover through or artificially concentrated run-off may occur (i.e. through the presence of impermeable surfaces such as the roads).
- » Visual impacts and impacts on 'sense of place' where the facility and/or associated infrastructure is viewed as visually obtrusive by potentially sensitive receptors.
- » Positive socio-economic impacts through job creation, skills development and through the development of clean, renewable energy projects.

The potential for cumulative impacts on the environment (positive and negative) associated with the presence of numerous facilities in the area. These potential impacts relate mainly to visual impacts and impacts on the social environment (in terms of job creation, local economic upliftment, etc.).

Potential sensitive areas have been identified through the environmental scoping study and are listed below. In order to reduce the potential for on-site environmental impacts, these areas should be avoided as far as reasonably possible. This 'funnel-down approach' in the consideration of the larger site focuses the detailed specialist studies in the EIA Phase to the portion of the site with reduced environmental sensitivities. These potentially sensitive areas already identified through the scoping study include:

- » Small saline pans: Construction activities may lead to some direct or indirect loss of or damage to some of these areas or changes to the catchment of these areas. This may lead to loss of habitat for species that depend on this habitat type. Pans may possibly be important habitat for a number of species in the study area, including those with a restricted distribution. They also provide a habitat for plants, insects, batrachians and birds. These areas must be protected.

Wet zones have been identified to the north west of the site through desktop investigation. These areas will have to be confirmed and delineated in the Impact Assessment phase of this EIA. A 50m buffer from these zones must be established

- » Potential occurrence of populations of Red List organisms and Protected Tree Species: This includes flora (including protected tree species) and fauna (including avifauna) that have been evaluated as having a chance of occurring within the study area. It has been evaluated that there are five mammal species, four bird species and one reptile species of conservation concern that could occur in available habitats in the proposed study area. This includes three species classified as Vulnerable, the Kori Bustard, African White-backed Vulture and Martial Eagle and three species classified as Near Threatened, the Honey Badger,

Schreiber's Long-fingered Bat, and the Southern African Hedgehog. However, none of these has been assessed as having a high probability of occurring on site. Tree species protected under the National Forest Act that have a geographical distribution that includes the study area are Camel Thorn, Grey Camel Thorn, and Shepard's Tree.

With an understanding of which area/s of the site would be least impacted by the development of such a facility, San Solar Energy Facility (Pty) Ltd can prepare the detailed infrastructure layouts for consideration within the EIA Phase to avoid potentially sensitive areas. During this phase more detailed studies will be conducted, and sensitive areas will be confirmed. Should there be additional sensitive areas, they will be identified and demarcated with more detail and accuracy than in this Final Scoping Report.

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DEFINITIONS AND TERMINOLOGY

Alternatives: Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, process or technology alternatives, temporal alternatives or the 'do nothing' alternative.

Article 3.1 (*sensu* Ramsar Convention on Wetlands): "Contracting Parties "shall formulate and implement their planning so as to promote the conservation of the wetlands included in the List, and as far as possible the wise use of wetlands in their territory"".(Ramsar Convention Secretariat. 2004. Ramsar handbooks for the wise use of wetlands. 2nd Edition. Handbook 1. Ramsar Convention Secretariat, Gland, Switzerland.) (see <http://www.ramsar.org/>)

Cumulative impacts: Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

Direct impacts: Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable

'Do nothing' alternative: The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

Endangered species: Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included here are taxa whose numbers of individuals have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

Endemic: An "endemic" is a species that grows in a particular area (is endemic to that region) and has a restricted distribution. It is only found in a particular place. Whether something is endemic or not depends on the geographical boundaries of the area in question and the area can be defined at different scales.

Environment: the surroundings within which humans exist and that are made up of:

- i. the land, water and atmosphere of the earth;
- ii. micro-organisms, plant and animal life;
- iii. any part or combination of (i) and (ii) and the interrelationships among and between them; and
- iv. the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Impact: An action or series of actions that have an effect on the environment.

Environmental impact assessment: Environmental Impact Assessment (EIA), as defined in the NEMA EIA Regulations and in relation to an application to which scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application.

Environmental management: Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental management plan: An operational plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its ongoing maintenance after implementation.

Indigenous: All biological organisms that occurred naturally within the study area prior to 1800

Indirect impacts: Indirect or induced changes that may occur as a result of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

Interested and Affected Party: Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups and the general public.

Natural properties of an ecosystem (*sensu* Convention on Wetlands): Defined in Handbook 1 as the "...physical, biological or chemical components, such as soil,

water, plants, animals and nutrients, and the interactions between them". (Ramsar Convention Secretariat. 2004. Ramsar handbooks for the wise use of wetlands. 2nd Edition. Handbook 1. Ramsar Convention Secretariat, Gland, Switzerland.) (see <http://www.ramsar.org/>)

Ramsar Convention on Wetlands: "The Convention on Wetlands (Ramsar, Iran, 1971) is an intergovernmental treaty whose mission is "the conservation and wise use of all wetlands through local, regional and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world". As of March 2004, 138 nations have joined the Convention as Contracting Parties, and more than 1300 wetlands around the world, covering almost 120 million hectares, have been designated for inclusion in the Ramsar List of Wetlands of International Importance." (Ramsar Convention Secretariat. 2004. Ramsar handbooks for the wise use of wetlands. 2nd Edition. Handbook 1. Ramsar Convention Secretariat, Gland, Switzerland.) (refer <http://www.ramsar.org/>). South Africa is a Contracting Party to the Convention.

Rare species: Taxa with small world populations that are not at present Endangered or Vulnerable, but are at risk as some unexpected threat could easily cause a critical decline. These taxa are usually localised within restricted geographical areas or habitats or are thinly scattered over a more extensive range. This category was termed Critically Rare by Hall and Veldhuis (1985) to distinguish it from the more generally used word "rare".

Red data species: Species listed in terms of the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species, and/or in terms of the South African Red Data list. In terms of the South African Red Data list, species are classified as being extinct, endangered, vulnerable, rare, indeterminate, insufficiently known or not threatened (see other definitions within this glossary).

Regional Methodology: The Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) have developed a guideline document entitled *Strategic Initiative to Introduce Commercial Land Based Wind Energy Development to the Western Cape - Towards a Regional Methodology for Wind Energy Site Selection* (Western Cape Provincial Government, May 2006). The methodology proposed within this guideline document is intended to be a regional level planning tool to guide planners and decision-makers with regards to appropriate areas for wind energy development (on the basis of planning, environmental, infrastructural and landscape parameters).

Significant impact: An impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

Sustainable Utilisation (*sensu* Convention on Wetlands): Defined in Handbook 1 as the "human use of a wetland so that it may yield the greatest continuous benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations". (Ramsar Convention Secretariat. 2004. Ramsar handbooks for the wise use of wetlands. 2nd Edition. Handbook 1. Ramsar Convention Secretariat, Gland, Switzerland.) (refer <http://www.ramsar.org/>).

Wise Use (*sensu* Convention on Wetlands): Defined in Handbook 1 (citing the third meeting of the Conference of Contracting Parties (Regina, Canada, 27 May to 5 June 1987) as "the wise use of wetlands is their sustainable utilisation for the benefit of humankind in a way compatible with the maintenance of the natural properties of the ecosystem".(Ramsar Convention Secretariat. 2004. Ramsar handbooks for the wise use of wetlands. 2nd Edition. Handbook 1. Ramsar Convention Secretariat, Gland, Switzerland.) (see <http://www.ramsar.org/>)

ABBREVIATIONS AND ACRONYMS

BID	Background Information Document
CBOs	Community Based Organisations
CDM	Clean Development Mechanism
CSIR	Council for Scientific and Industrial Research
CO ₂	Carbon dioxide
D	Diameter of the rotor blades
DEDEA	Eastern Cape Department of Economic Development and Environmental Affairs
DEAT	National Department of Environmental Affairs and Tourism
DEA	National Department of Environmental Affairs
DME	Department of Minerals and Energy
DOT	Department of Transport
DWAF	Department of Water Affairs and Forestry
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
GIS	Geographical Information Systems
GG	Government Gazette
GN	Government Notice
GWh	Giga Watt Hour
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
IEP	Integrated Energy Planning
km ²	Square kilometres
km/hr	Kilometres per hour
kV	Kilovolt
m ²	Square meters
m/s	Meters per second
MW	Mega Watt
NEMA	National Environmental Management Act (Act No 107 of 1998)
NERSA	National Energy Regulator of South Africa
NHRA	National Heritage Resources Act (Act No 25 of 1999)
NGOs	Non-Governmental Organisations
NIRP	National Integrated Resource Planning
NWA	National Water Act (Act No 36 of 1998)
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SANRAL	South African National Roads Agency Limited
SDF	Spatial Development Framework
SIA	Social Impact Assessment
ZVI	Zone of visual influence

INTRODUCTION

CHAPTER 1

San Solar Energy Facility (Pty) Ltd proposes to established a commercial solar energy facility with associated infrastructure on the remaining extent of the farm Wincanton 472. This proposed site lies approximately 16 km northwest of Kathu in the Northern Cape (refer to Figure 1.1).

The San Solar Energy Facility proposes to accommodate several arrays of **photovoltaic (PV) panels** with associated infrastructure on a <500ha portion of the proposed site. The proposed development area is preferred due to the following site characteristics:

- Climatic conditions: Climatic conditions determine the economic viability of a solar energy facility as it is directly dependent on the annual direct solar irradiation values for a particular area;
- Orographic conditions: The site conditions are optimum for a development of this nature;
- Extent of the site: Significant land area is required for the proposed development; and
- Proximity: This site is in close proximity to an existing electricity grid connection, which minimises the need for a long connection power line.

The nature and extent of this facility, as well as potential environmental impacts associated with the construction, operation and decommissioning phases are explored in more detail in this Final Scoping Report.

1.1. Summary of the Proposed Development

The solar energy facility is proposed to be established on a portion of the remaining extent of the farm Wincanton 472, which falls within the Gamagara Local Municipality of the Northern Cape Province. The identified site has direct road access via the R380, and lies outside of the Sishen Mine area located to the south. The larger site covers an area of approximately 800 ha which is larger than the development footprint of ~ 300 ha for the proposed facility (extent to be confirmed during the EIA Phase). The facility can therefore be appropriately placed within the larger site taking any identified environmental constraints into consideration.

The solar energy facility is proposed to generate 75 MW of electricity (91 MW installed capacity). The facility will comprise of PV panels and associated infrastructural requirements which will include:

- » A single substation and overhead power line to facilitate the connection between the solar energy facility and the Eskom electricity grid.
- » Internal access roads.
- » Gate house and security.
- » Warehouse.
- » Canteen and change rooms.
- » Office and Control centre.

The overarching objective for the solar energy facility is to maximise electricity production through **exposure to the solar resource**, while minimising infrastructure, operational and maintenance costs, as well as **social and environmental impacts**. In order to meet these objectives local level environmental and planning issues will be assessed through site-specific studies in order to delineate areas of sensitivity within the broader site of which will serve to inform the design of the facility.

The scope of the proposed San Solar Energy Facility, including details of all elements of the project (for the design/planning, construction, operation and decommissioning Phases) is discussed in more detail in Chapter 2.

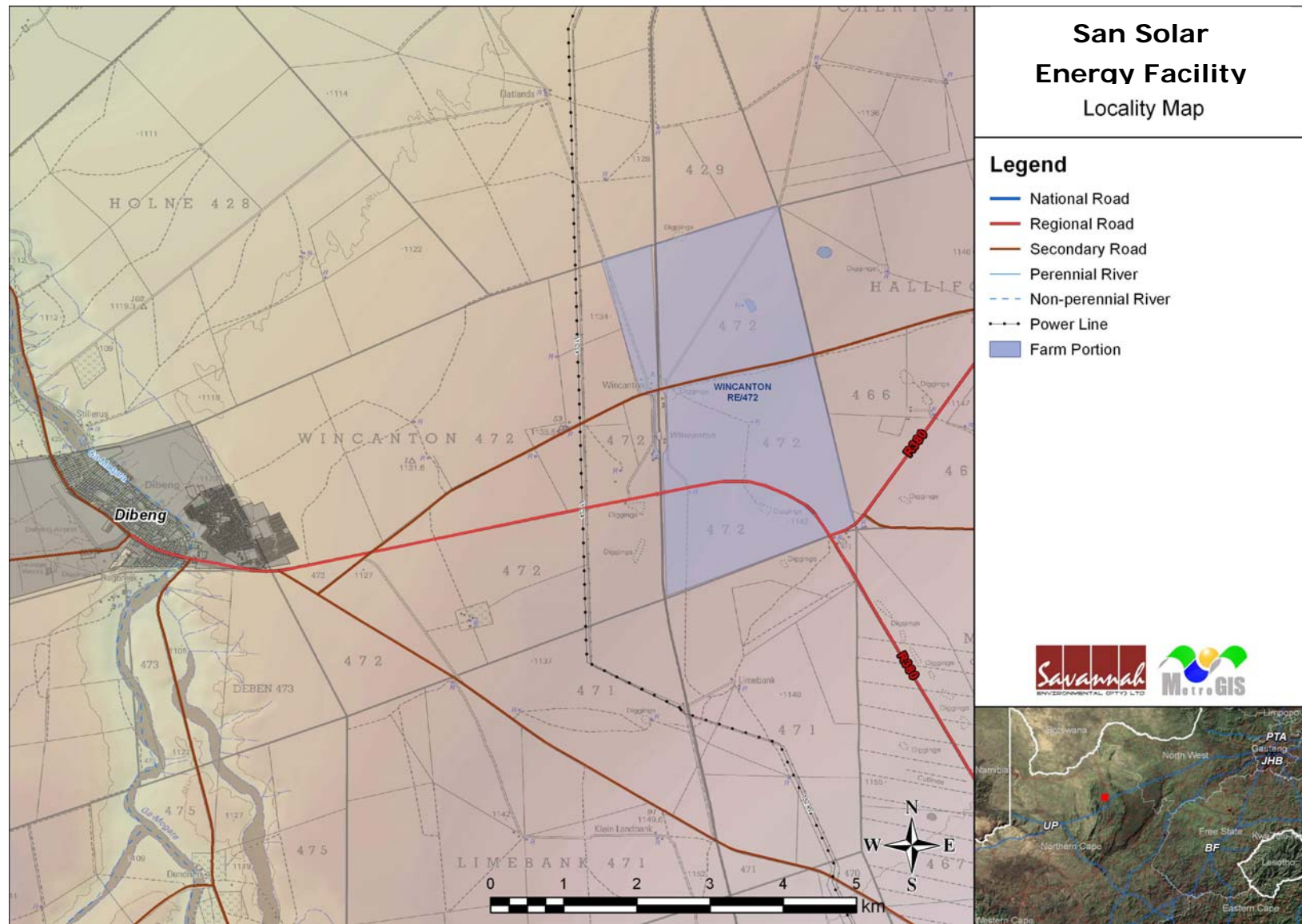


Figure 1.1: Locality map showing the proposed location for the San Solar Energy Facility

1.2. Rationale for the proposed San Solar Energy Facility

Globally there is increasing pressure on countries to increase their share of renewable energy generation due to concerns such as climate change and exploitation of non-renewable resources. In order to meet the long-term goal of a sustainable renewable energy industry, a goal of 17,8GW of renewables by 2030 has been set by the Department of Energy (DoE) within the Integrated Resource Plan (IRP) 2010. This energy will 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 ~42% of all new power generation being derived from renewable energy forms by 2030. This is however dependent on the assumed learning rates and associated cost reductions for renewable options.

In responding to the growing electricity demand within South Africa, as well as the country's targets for renewable energy, San Solar Energy Facility (Pty) Ltd is proposing the establishment of the San Solar Energy Facility to add new capacity to the national electricity grid. The San Solar Energy Facility will be required to apply for a generation license from the National Energy Regulator of South Africa (NERSA), as well as a power purchase agreement from Eskom (typically for a period of 20 - 25 years) in order to build and operate the proposed facility. As part of the agreement, San Solar Energy Facility will be remunerated per kWh by Eskom. Depending on the economic conditions following the lapse of this period, the facility can either be decommissioned or the power purchase agreement may be renegotiated and extended.

Long-term benefits for the community and/or society in general can be realised should the site identified by San Solar Energy Facility prove to be acceptable from a technical and environmental perspective for the potential establishment of the solar energy facility. It is important to note that should the proposed facility be successful it would strengthen and contribute to the existing electricity grid for the region (to a limited extent due to the small facility size). Furthermore the operation of the proposed facility would assist South Africa to achieve its goal of attaining a 30% share of all new power generation derived from independent power producers (IPPs), as targeted by the Department of Energy (DoE).

1.3. Requirement for an Environmental Impact Assessment Process

The proposed solar energy facility is subject to the requirements of the EIA Regulations published in terms of Section 24(5) of NEMA. This section provides a brief overview of the EIA Regulations and their application to this project.

NEMA is the national legislation that provides for the authorisation of 'listed activities'. In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these activities must be considered, investigated, assessed, and reported on to the competent authority that has been charged by NEMA with the responsibility of granting environmental authorisations. As this is a proposed electricity generation project and thereby considered to be of national importance, the National Department of Environmental Affairs (DEA) is the competent authority and the Northern Cape Department of Environment and Nature Conservation (DENC) will act as a commenting authority. An application for authorisation has been accepted by DEA under application reference number **14/12/16/3/3/2/273**.

The need to comply with the requirements of the EIA Regulations ensures that the competent authority is provided with the opportunity to consider the potential environmental impacts of a project early in the project development process and to assess if potential environmental impacts can be avoided, minimised or mitigated to acceptable levels. Comprehensive, independent environmental studies are required in accordance with the EIA Regulations to provide the competent authority with sufficient information in order to make an informed decision. San Solar Energy Facility appointed Savannah Environmental as the independent Environmental Assessment Practitioner (EAP) to conduct the EIA process for the proposed project.

An EIA is also an effective planning and decision-making tool for the project developer as it allows for the identification and management of potential environmental impacts. It provides the opportunity for the developer to be forewarned of potential environmental issues, and allows for resolution of the issues reported on in the Scoping and EIA Reports as well as dialogue with interested and affected parties (I&APs).

In terms of sections 24 and 24D of NEMA, as read with the EIA Regulations of GNR 543; GNR544; GNR545; and GNR546, both Scoping and EIA processes are required as the proposed project includes the following 'listed activities.' The listed activities triggered by the proposed solar facility include:

Relevant Notice	Activity No	Description of listed activity	Description of relevance
GN 544, 18 June 2010	10 (i)	The construction of facilities or infrastructure for the transmission and distribution of electricity – i. Outside urban areas or industrial complexes with a capacity of more than 33kv but less than 275kv; or ii. Inside urban areas or industrial complexes with a capacity of 275kv or more.	<u>The distribution line</u> associated with facility will have a capacity of more than 33kv but less than 275kv.
GN 544, 18 June 2010	11 (x) and (xi)	The construction of: i. Canals; ii. Channels; iii. Bridges; iv. Dams; v. Weirs; vi. Bulk stormwater outlet structures; vii. Marinas; viii. Jetties exceeding 50 square metres in size ix. Slipways exceeding 50 square metres in size x. Buildings exceeding 50 square metres in size; or xi. Infrastructure or structures covering 50 square metres or more Where such construction occurs within a watercourse or within 32 metres of a watercourse, measures from the edge of a watercourse , excluding where such construction will occur behind the development setback line	Infrastructure or structures covering over 50 square metres (PV panels) may be required to be constructed close to watercourses/ <u>pans</u> on site. However this is to be confirmed during the scoping phase of this.
GN 545, 18 June 2010	1	The construction of facilities or infrastructure, for the generation of electricity	Facility is proposed to generate 75 MW (91MW installed capacity).

Relevant Notice	Activity No	Description of listed activity	Description of relevance
		where the output is 20 megawatts or more.	
GN 545, 18 June 2010	15	Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; except where such physical alteration takes place for: (i) linear development activities; or (ii) agriculture or afforestation where activity 16 in this Schedule will apply.	The proposed solar energy facility would transform an area greater than 20 ha.

This Final Scoping Report documents the evaluation of the potential environmental impacts of the proposed solar facility and forms part of the EIA process.

1.4. Details of the Environmental Assessment Practitioner and Expertise to conduct the Scoping and EIA Phases

Savannah Environmental was contracted by San Solar Energy Facility (Pty) Ltd as the independent EAP to undertake both Scoping and EIA processes for the proposed project. Neither Savannah Environmental nor any of the associated specialist sub-consultants on this project are subsidiaries of or are affiliated to the applicant. Furthermore, Savannah Environmental does not have any interests in secondary developments that may arise out of the authorisation of the proposed project.

Savannah Environmental is a specialist environmental consulting company providing holistic environmental management services, including environmental impact assessments and planning to ensure compliance and evaluate the risk of development; and the development and implementation of environmental management tools. Savannah Environmental benefits from the pooled resources, diverse skills and experience in the environmental field held by its team.

The Savannah Environmental team have considerable experience in environmental impact assessments and environmental management, and have been actively involved in undertaking environmental studies, for a wide variety of projects throughout South Africa, including those associated with electricity generation.

The EAPs from Savannah Environmental who are responsible for this project are:

- » Karen Jodas - a registered Professional Natural Scientist and holds a Master of Science degree. She has 14 years of experience consulting in the environmental field. Her key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. She is currently responsible for the project management of EIAs for several renewable energy projects across the country.

- » Sanusha Govender - The principle environmental scientist for this project. Sanusha holds a BSc in Environment and Development with 6 years of experience in the environmental field. She specialises in managing environmental processes such as Environmental Impact Assessments, Environmental Basic Assessments, Environmental Management Plans, Environmental Auditing ISO 14001, Integrated Waste Management Strategies and the development of Municipal Refuse Bylaws.

Refer to **Appendix A** for curriculum vitae for the Environmental Impact Assessment team.

OVERVIEW OF THE PROPOSED PROJECT

CHAPTER 2

The following chapter provides an overview of the proposed San Solar Energy Facility and details the project scope which includes the planning/design, construction, operation and decommissioning activities. This chapter also explores site and technology alternatives as well as a “do nothing” option. Lastly, it explores solar energy facilities as a means for power generation.

The solar facility is proposed to be established on a portion of the remaining extent of the Farm Wincanton 472, which lies approximately 16 km northwest of the town of Kathu in the Northern Cape Province.

The identified site has direct road access via the R380, and lies outside of the Sishen Mine area located to the south. The larger site covers an area of approximately 800 ha which is larger than the development footprint of ~ 300 ha for the proposed facility (extent to be confirmed during the EIA Phase). The facility can therefore be appropriately placed within the larger site taking environmental any identified constraints into consideration.

The facility is proposed to generate 75 MW (91 MW installed capacity), and will be comprised of PV panels and associated infrastructural requirements which will include:

- » PV panels with a generation capacity of 75MW (91 MW installed capacity)
- » An on-site generator transformer and a single substation to facilitate the connection between the solar energy facility and the Eskom electricity grid
- » An overhead power line
- » Internal access roads (~4m x 5000m)
- » Gate house and security (~6m x 6m)
- » Warehouse (~30m x 15m)
- » Canteen and change rooms (~20m x 10m)
- » Office and control centre (~20m x 15m)

2.1. Nomination of the Northern Cape for Solar Energy Development

The University of Stellenbosch determined which areas of South Africa are most suitable for solar facilities (Fluri, 2009). This suitability was determined by overlaying several GIS layers/screens with certain areas such as nature conservancies, airports, military bases, water surfaces, and built up areas being ruled outright.

These GIS layers included:

- » The solar resource – only sites with an annual average daily direct normal irradiation (DNI) higher than 7 kWh/m²/day were deemed suitable.
- » Land use – areas characterised as “Least Threatened” according to Mucina and Rutherford’s Vegetation Map of South Africa were deemed suitable.
- » Topography – a digital elevation model was used to select only those areas with a slope of less than 1%.
- » Potential for evacuation options – the solar facilities would need to be sited at a reasonable distance from a point of evacuation to the National Grid in order to remain efficient from a cost and line loss¹ perspective.

The solar resource in the Northern Cape Province has shown the most potential for the development of large-scale solar energy facilities (Pletka et al, 2007). The study concluded that the Northern Cape alone could accommodate approximately 500 GW.

2.2. Project Alternatives

In accordance with the requirements of the EIA Regulations², alternatives are required to be considered within the EIA process, and may refer to any of the following:

- » Site alternatives
- » Design or layout alternatives
- » Technology alternatives
- » No-go alternative

2.2.1. Site Alternatives

Due to the nature of the development (i.e. a renewable energy facility), the location of the project is largely dependent on technical factors such as solar irradiation (i.e. the fuel source), climatic conditions, extent and topography of the site and available grid connection. The proposed site was identified by the proposed developer as being technically feasible. No feasible site alternatives within the broader area were identified for this specific project by the project developer.

¹ Line losses usually refer to energy waste resulting from the transmission of electrical energy across power lines.

² GNR543 27(e) calls for the applicant to identify feasible and reasonable alternatives for the proposed activity.

The following characteristics were considered in determining the feasibility of the proposed site. Based on these considerations, San Solar Energy Facility (Pty) Ltd considers the proposed site as their highly preferred site for the development of the San Solar Energy Facility.

Site extent: Space is a restraining factor for a PV solar facility installation. A PV solar facility of 10 MW will require approximately 0.15 km². As such the proposed site which is approximately 8 km² in extent will be sufficient for the installation of approximately 75 MW (which would require an area of up to 1.5 km²).

Site access: The site can be directly accessed via the R380 provincial route, which branches off the N14 National road, approximately 3 km south of Kathu.

Climatic conditions: The economic viability of a PV facility is directly dependent on the annual direct solar irradiation values. The Northern Cape receives the highest average daily direct normal irradiation in South Africa which indicates that the regional location of the project is appropriate to a solar energy facility.

Site slope and aspect: A level surface area (i.e. with a minimal gradient in the region of 1%) is preferred for the installation of PV panels (Fluri, 2009) (refer to **Figure 2.1**).

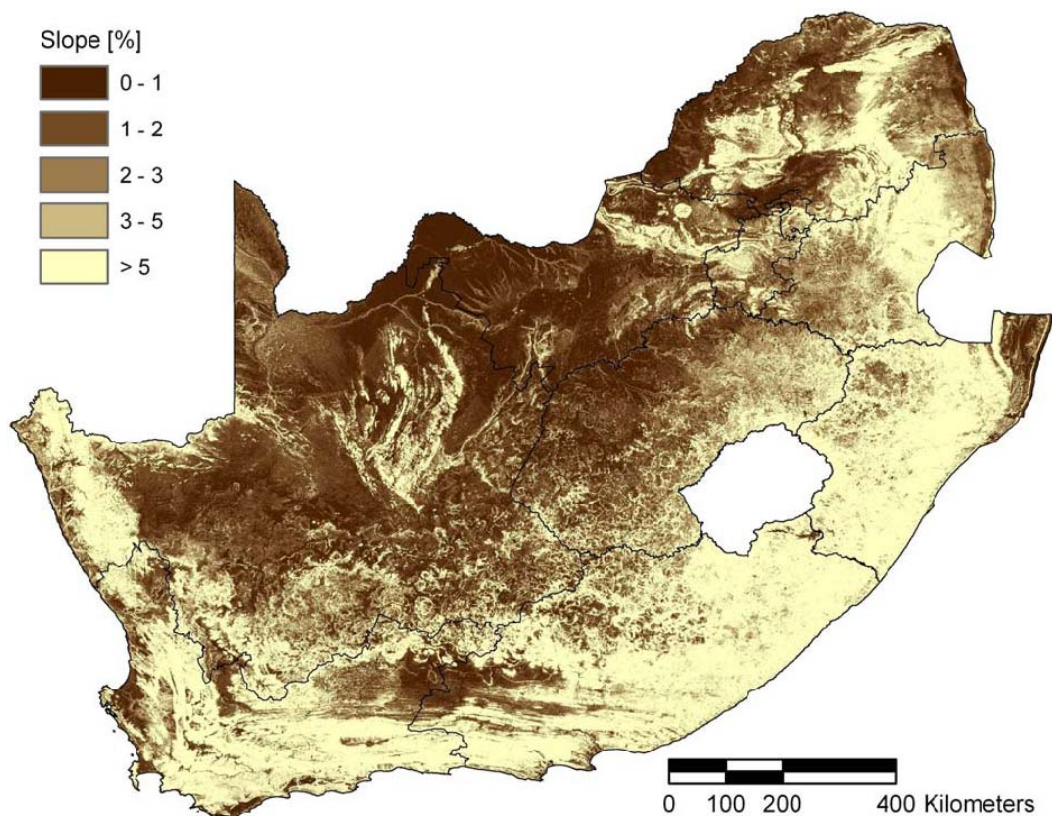


Figure 2.1: The gradient/slope within South Africa as derived from a digital terrain model (Fluri, 2009, based on data from Shuttle Radar Topography Mission). The gradient increases as the colour on the map become lighter, therefore indicating that the Northern Cape, and the area near to Kathu, is deemed suitable for the proposed site from a gradient perspective.

Threatened vegetation: The identified site has been identified as falling within a vegetation type categorised as 'least threatened' (according to Mucina and Rutherford (2004)) (refer to Figure 2.2).

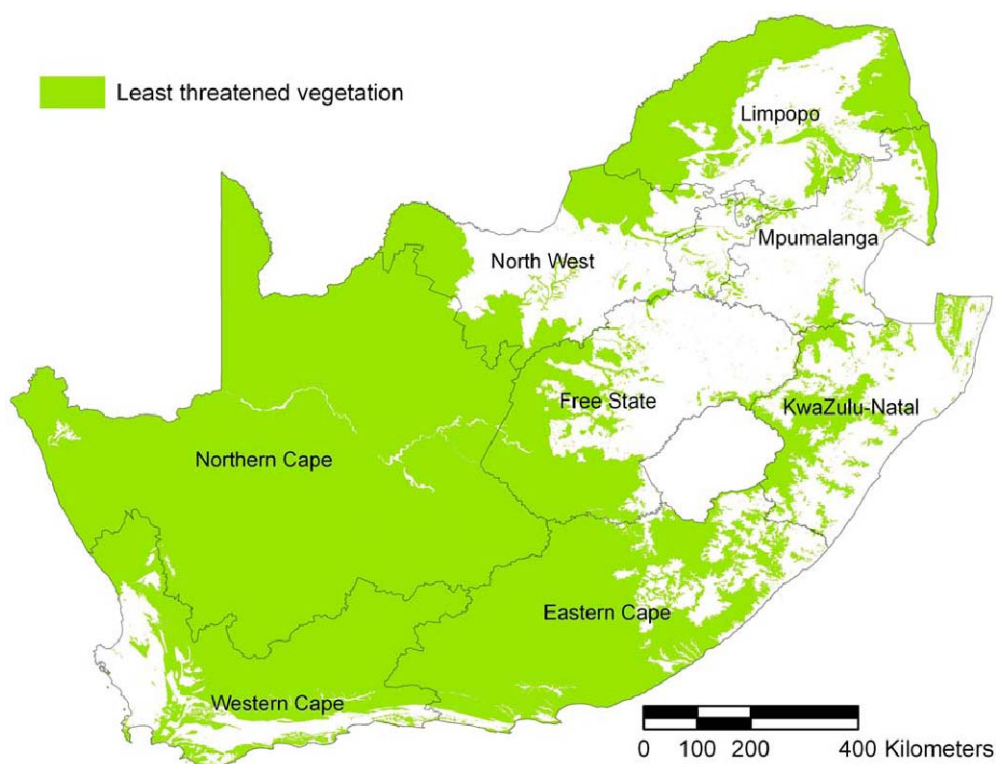


Figure 2.2: Least threatened vegetation types within South Africa (Fluri, 2009, based on data from Mucina and Rutherford (2004))

Grid connection:

Energy generated by the San Solar Energy Facility will be evacuated to the national grid via a new substation (which will be constructed on the site). At this scoping stage the most feasible alternative for the position of the substation on site is proposed. This position is within the site development footprint, and lies on the eastern side of the property, which provides the most direct access to the Eskom Ferrum-Umtu 132kV power line (thereby ensuring the shortest connection power line to the Eskom grid as possible). As the detailed site surveys are concluded within EIA Phase it may arise that there are other environmentally and technically feasible positions for the substation which are not identified at this stage.

The on-site substation is proposed to be connected to the grid via a loop-in loop-out connection to the Ferrum-Umtu 132kV power line which is currently under construction by Eskom. This power line lies immediately east of the proposed site. A separate application for environmental authorisation has been submitted to the DEA for the proposed development of a 132kV power line that would connect the Kathu, Sishen and San Solar Energy facilities to the Ferrum-Umtu 132kV power line (refer to Appendix D, Map 2 which depicts the servitude proposed for the new connection between the Kathu, Sishen and San Solar Energy facilities and the Ferrum-Umtu 132kV power line³). The on-site substation would be connected to this 132kV power line via a short new power line on the San Solar site.

2.2.2. *Layout Design Alternatives*

The proposed facility is expected to have a development footprint which is smaller than the identified site. Therefore the facility and its associated infrastructure (i.e. power lines and internal roads, etc.) can be appropriately located and avoid identified sensitive areas (e.g. wetland and water bodies) within the broader site. Therefore, the extent of the site allows for the identification of layout design and site-specific alternatives.

The Scoping Phase aims to identify potentially environmentally sensitive areas which should be avoided by the proposed development as far as possible. These areas will need to be considered in detail during the EIA Phase through site-specific specialist studies. The information from these studies will be used to inform layout alternatives for the proposed development site and inform recommendations regarding a preferred alternative. Specific design alternatives will include *inter alia* the layout of the PV panels and the access roads. The aim of this planning process is to avoid environmentally sensitive areas as far as possible. Feasible design alternatives will be assessed within the EIA phase of the process.

During this scoping study, an ecologist outlined the sensitive areas where no development is advised. Taking sensitive areas into consideration a preliminary layout was developed.

2.2.3. *Alternative Foundations*

The PV cells will be arranged in arrays. Depending on the ground conditions, different methods of mounting the foundation structure onto the ground may be

³ The 132kV power line for connection to the Eskom grid has now been authorised by DEA.

used such as using concrete plinths, excavating foundations, or either rammed steel piles or piles with pre-manufactured concrete footings to support the PV panels. The type of foundation to be used will be confirmed in the EIA phase following an assessment of potential impacts on soils, as well as a detailed geotechnical investigation.

2.2.4. Technology Alternatives

Very few technological options exist in as far as PV technologies are concerned; those that are available are usually differentiated by weather and temperature conditions that prevail – so that optimality is obtained by the final choice. The impacts of any of the PV technology choices are the same. Therefore, the choice of technology does not affect the environmental impact of the proposed development. The construction, operation and decommissioning of the facility will also be the same irrespective of the technology chosen. Therefore, no alternatives were assessed in this regard.

2.3. The 'Do-Nothing' Alternative

The 'do-nothing' alternative is the option of not constructing the proposed San Solar Energy Facility. Should this alternative be selected then there will be impacts at a local and a broader scale. From a local perspective, the identified site, which is zoned for agricultural purposes, would not be impacted on from an environmental perspective, and could be utilised for future agricultural activities. However, at a broader scale, the benefits of this renewable energy facility would not be realised. The generation of electricity from renewable energy resources offers a range of potential socio-economic and environmental benefits for South Africa. These benefits 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.

- » **Resource saving:** Conventional coal fired plants are major consumers of water during their requisite cooling processes. It is estimated that the achievement of the targets in the Renewable Energy White Paper will result in water savings of approximately 16.5 million kilolitres, when compared with wet cooled conventional power stations. This translates into revenue savings of R26.6 million. As an already water-stressed nation, it is critical that South

Africa engages in a variety of water conservation measures, particularly due to the detrimental effects of climate change on water availability.

- » ***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. The use of solar radiation for power generation is considered a non-consumptive use of a natural resource which produces zero greenhouse gas emissions.
- » ***Climate friendly development:*** The uptake of renewable energy offers the opportunity to address energy needs in an environmentally responsible manner and thereby allows South Africa to contribute towards mitigating climate change through the reduction of greenhouse gas (GHG) emissions. South Africa is estimated to be responsible for approximately 1% of global GHG emissions and is currently ranked 9th worldwide in terms of per capita carbon dioxide emissions.
- » ***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 and climate friendly development.
- » ***Support to a new industry sector:*** The development of renewable energy offers the opportunity to establish a new industry within the South African economy.

The do nothing alternative will be assessed within the EIA phase of the process.

2.4. Solar Energy as a Power Generation Option

Solar energy facilities convert solar energy to a useful form, such as electricity. Solar energy facilities produce an insignificant quantity of greenhouse gases over its lifecycle as compared to conventional coal-fired power stations. The operational phase of a solar facility does not produce carbon dioxide, sulphur dioxide, mercury, particulates, or any other type of air pollution, as do fossil fuel power generation technologies.

2.4.1. How do Grid Connected PV Facilities Function

Globally, the solar PV market grew by 110% in 2008. Although South Africa has high levels of irradiation and could achieve between 4.5 kWh/m² and 6.55 kWh/m² from a solar PV panel, the installed capacity country-wide is currently only 12 MW.

Solar energy facilities, such as those using PV technology use the energy from the sun to generate electricity through a process known as the Photovoltaic Effect. This is achieved using the following components:

- » **Photovoltaic Cells:** An individual photovoltaic cell is made of silicone which acts as a semiconductor (refer to Figure 2.3). The cell absorbs solar radiation which energises the electrons inside the cells and produces electricity. Individual PV cells are linked and placed behind a protective glass sheet to form a photovoltaic panel. A single cell is sufficient to power a small device such as an emergency telephone, however to produce 75 MW of power, the proposed facility will require numerous cells arranged in multiples/arrays which will be fixed to a support structure (refer to Figure 2.3).



Figure 2.3: Figures showing a typical PV cell and an array of PV panels, where each panel is generally up to 2 m high.

- » **Support Structure:** The PV panels will be fixed to a support structure which will allow for them to be set at an angle so to receive the maximum amount

of solar radiation. The angle of the panels is dependent on the latitude of the proposed facility and may be adjusted to optimise for summer or winter solar radiation characteristics. The height of the PV arrays is expected to be up to 2 m.

2.5. Overview of the Construction Phase

In order to construct the proposed solar energy facility and associated infrastructure, a series of activities will need to be undertaken. The construction process is discussed in more detail below.

2.5.1. Conduct Surveys

Prior to initiating construction, a number of surveys will be required including, but not limited to, a geotechnical survey, a site survey and confirmation of the micro-siting footprint, survey of substation site and survey of power line and road servitudes.

2.5.2. Establishment of Access Roads to the Site

The R380 provincial route runs parallel to the site. Access to the site will be from this road. Within the site itself, access will be required from this existing provincial road to the individual facility components for construction purposes (and later limited access for maintenance). Access track construction would normally comprise of compacted rock-fill with a layer of higher quality surfacing stone on top. The strength and durability properties of the rock strata at the proposed site are not known at this stage; this will need to be assessed via a geotechnical study to be conducted by the project proponent. Depending on the results of these studies, it may be possible, in some areas, to strip off the existing vegetation and ground surface and level the exposed formation to form an access track surface. The final layout of the access roads will be determined following the identification of site related sensitivities.

2.5.3. Undertake Site Preparation

Site preparation activities will include clearance of vegetation at the footprint of each project component. These activities will require the stripping of topsoil which will need to be stockpiled, backfilled and/or spread on site.

2.5.4. Transport of Components and Equipment to Site

The components and equipment required for the construction of the proposed facility will be brought to site in sections by means of national and provincial roads and then proposed internal access road. Some of the components (i.e. generator transformer) may be defined as abnormal loads in terms of the Road Traffic Act (Act No. 29 of 1989)⁴ by virtue of the dimensional limitations (i.e.

⁴ A permit will be required for the transportation of these abnormal loads on public roads.

length and weight). During the construction phase the existing road infrastructure may require alterations (e.g. widening on corners), accommodation of street furniture (e.g. street lighting, traffic signals, telephone lines etc) and protection of road-related structures (i.e. bridges, culverts, portal culverts, retaining walls etc) as a result of abnormal loading.

Typical civil engineering construction equipment will need to be brought to the site (e.g. excavators, trucks, graders, compaction equipment, cement trucks, etc.) as well as components required for the establishment of the substation and power lines.

2.5.5. Establishment of Laydown Areas on Site

Laydown and storage areas will be required for the typical construction equipment which will be required on site.

2.5.6. Construct Substation

A single substation) will be required to facilitate the connection between the solar energy facility and the Eskom electricity grid. The position of the substation within the footprint of the broader site will be informed by the final positioning of the PV components.

The construction of the substation would require:

- a survey of the site
- site clearing and levelling
- construction of access road/s (where required)
- construction of a level terrace and foundations, assembly, erection, installation and connection of equipment, and rehabilitation of any disturbed areas and protection of erosion sensitive areas.

2.5.7. Establishment of Ancillary Infrastructure

Ancillary infrastructure for the proposed development includes:

- » Gate house and security (6m x 6m)
- » Warehouse (30m x 15m)
- » Canteen & change rooms (20m x 10m)
- » Office & Control Centre 20m x 15m

The establishment of these facilities/buildings will require the clearing of vegetation and levelling of the development site and the excavation of

foundations prior to construction. A laydown area for building materials and equipment associated with these buildings will also be required.

2.5.8. Connect Substation to Power Grid

Energy generated by the San Solar Energy Facility will be evacuated to the national grid via a new substation (which will be constructed on the site). The substation is proposed to be connected via a loop-in loop-out connection to the Ferrum-Umtu 132kV power line which is currently under construction by Eskom. This power line lies ~5km east of the proposed site.

2.5.9. Undertake Site Rehabilitation

Once construction is completed and once all construction equipment is removed, the site must be rehabilitated where practical and reasonable. On full commissioning of the facility, any access points to the site which are not required during the operational phase must be closed and rehabilitated.

2.6. Operation Phase

The electricity that is generated from the PV panels will be stepped up through an on-site generator transformer. Thereafter the power will be evacuated from a new substation via a new overhead power line to feed into the Ferrum – Umtu 132kV power line.

It is anticipated that a full-time security, maintenance and control room staff will be required on site. Each component within the solar energy facility will be operational except under circumstances of mechanical breakdown, unfavourable weather conditions, or maintenance activities.

2.7. Decommissioning Phase

The solar energy facility is expected to have a lifespan of approximately 30 years (with maintenance) and the power plant infrastructure would only be decommissioned once it has reached the end of its economic life. If economically feasible/desirable the decommissioning activities would comprise the disassembly and replacement of the individual components with more appropriate technology/ infrastructure available at that time. However, if not deemed so, then the facility would be completely decommissioned which would include the following decommissioning activities.

2.7.1. Site Preparation

Site preparation activities will include:

- » Confirming the integrity of the site access to accommodate the required equipment (e.g. lay down areas, construction platform)
- » The mobilisation of decommissioning equipment.

2.7.2. Disassemble and Replace Existing Components

The components would be disassembled, and reused and recycled (where possible), or disposed of in accordance with regulatory requirements.

APPROACH TO UNDERTAKING THE SCOPING PHASE

CHAPTER 3

An EIA refers to the process involving the identification and assessment of direct, indirect, and cumulative environmental impacts associated with a proposed project. The EIA process comprises two Phases: a **Scoping Phase** and an **EIA Phase**. The Scoping Phase culminates in the submission of a Scoping Report to DEA as the competent authority for review and acceptance before proceeding onto the EIA Phase of the process. The EIA Phase culminates in the submission of an EIA Report, including a draft Environmental Management Programme (EMP), to the competent authority for decision-making.



Figure 3.1: The four phases of an EIA Process

The Scoping Phase for the proposed solar energy facility has been undertaken in accordance with the EIA Regulations GNR 543; GNR544; GNR545; and GNR546, in terms of Section 24(5) of NEMA. This Final Scoping Report aims to:

- » Identify and briefly describe the receiving environment and the potential environmental impacts associated with the proposed project.
- » Define the extent of the specialist studies required within the EIA Phase. This was achieved through an evaluation of the proposed project, as well as a consultation process with key stakeholders (including relevant government authorities) and I&APs.

This chapter serves to outline the process which was followed during the Scoping Phase.

3.2. Objectives of the Scoping Phase

The Scoping Phase aims to:

- » Describe the baseline/affected environment prior to development.
- » Identify potential environmental/social impacts (both positive and negative) during the construction and operation phases of the proposed development, within the broader study area through a desk-top review of existing baseline data.
- » Make recommendations regarding more detailed studies required in the EIA Phase of the process.
- » Provide the authorities with sufficient information in order to make a decision regarding the scope of issues to be addressed in the EIA process, as well as regarding the scope and extent of specialist studies that will be required as part of the EIA Phase.

Within this context, the objectives of this Scoping Phase are to:

- » Describe the scope and nature of the proposed development.
- » Describe the reasonable and feasible project-specific alternatives to be considered through the EIA process, including the 'no-go' option.
- » Identify and evaluate key environmental issues/impacts associated with the proposed project and, through a process of broad-based consultation with I&APs and stakeholders, identify those issues to be assessed in more detail in the EIA Phase of the EIA process.
- » Conduct an open, participatory, and transparent public involvement process and facilitate the inclusion of I&AP and stakeholder concerns regarding the proposed project in the decision-making process.

3.1. Regulatory and Legal Context

The regulatory hierarchy for an energy generation project of this nature consists of three tiers of authority which exercise control through both statutory and non-statutory instruments – that is National, Provincial and Local levels.

As the development of solar energy projects is multi-sectoral, encompassing economic, spatial, biophysical, and cultural dimensions, various statutory bodies are likely to be involved in the approval process for the proposed facility.

3.2.1. Regulatory Hierarchy

At the National Level, the main regulatory agencies are:

- » *Department of Energy (formerly DME)*: This department is responsible for policy relating to all energy forms, including renewable energy, and are responsible for forming and approving the IRP (Integrated Resource Plan for Electricity). Wind energy is considered under the White Paper for Renewable Energy (2003) and the Department undertakes research in this regard. It is the controlling authority in terms of the Electricity Regulation Act (Act No 4 of 2006).
- » *National Energy Regulator of South Africa (NERSA)*: This body is responsible for regulating all aspects of the electricity sector, and will ultimately issue licenses for solar energy developments to generate electricity.
- » *Department of Environmental Affairs (DEA)*: This department is responsible for environmental policy and is the controlling authority in terms of NEMA and the EIA Regulations. The DEA is the competent authority for this project, and charged with granting the relevant environmental authorisation.
- » *The South African Heritage Resources Agency (SAHRA)*: The National Heritage Resources Act (Act No 25 of 1999) and the associated provincial regulations provides legislative protection for listed or proclaimed sites, such as urban conservation areas, nature reserves and proclaimed scenic routes.
- » *National Department of Agriculture, Forestry, and Fisheries (DAFF)*: This department is responsible for activities pertaining to subdivision and rezoning of agricultural land. The forestry section is responsible for the protection of tree species under the National Forests Act (Act No 84 of 1998).
- » *South African National Roads Agency (SANRAL)*: This department is responsible for all national routes.

At the Provincial Level, the main regulatory agencies are:

- » *Provincial Government of the Northern Cape – Department of Environmental and Nature Conservation (DENC)*: This department is the commenting authority for this project.
- » *Department of Transport and Public Works*: This department is responsible for roads and the granting of exemption permits for the conveyance of abnormal loads on public roads.
- » *Provincial Department of Water Affairs*: This department is responsible for water use licensing and permits.

At the local level, the local and municipal authorities are the principal regulatory authorities responsible for planning, land use and the environment. In the Northern Cape, both the local and district municipalities play a role. The local municipality is the Gamagara Local Municipality which forms part of the Kgalagadi District Municipality. There are also numerous non-statutory bodies such as environmental non-governmental organisations (NGOs) and community based organisations (CBO) working groups that play a role in various aspects of

planning and environmental monitoring that will have some influence on proposed solar energy development in the area.

3.1.2. Legislation and Guidelines that have informed the preparation of this Scoping Report

The following legislation and guidelines have informed the scope and content of this draft Scoping Report.

- » National Environmental Management Act (Act No 107 of 1998).
- » EIA Regulations, published under Chapter 5 of the NEMA (GNR543, GNR544, GNR545, and GNR546 in Government Gazette 33306 of 18 June 2010).
- » Guidelines published in terms of the NEMA EIA Regulations, in particular:
 - * Companion to the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations of 2010 (Draft Guideline; DEA, 2010).
 - * Public Participation in the EIA Process (DEA, 2010).

Several other Acts, standards, or guidelines have also informed the project process and the scope of issues evaluated in the Scoping Report and to be addressed in the EIA Phase. A listing of relevant legislation identified at this stage in the process is provided in Table 3.1. A more detailed review of legislative requirements applicable to the proposed project will be included in the EIA Phase.

Table 3.1: Initial review of relevant policies, legislation, guidelines, and standards applicable to the San Solar Energy Facility

Legislation	Applicable Sections
<i>National Legislation</i>	
Constitution of the Republic of South Africa (Act No 108 of 1996)	<ul style="list-style-type: none"> » Bill of Rights (S2). » Environmental Rights (S24) – i.e. the right to an environment which is not harmful to health and well-being. » Rights to freedom of movement and residence (S22). » Property rights (S25). » Access to information (S32). » Right to just administrative action (S33).
National Environmental Management Act (Act No 107 of 1998)	<ul style="list-style-type: none"> » National environmental principles (S2), providing strategic environmental management goals, and objectives of the government applicable throughout the Republic to the actions of all organs of state that may significantly affect the

Legislation	Applicable Sections
	<p>environment.</p> <ul style="list-style-type: none"> » NEMA EIA Regulations (GNR GNR543, GNR544, GNR545, and GNR546) (published in terms of Chapter 5), with effect from 18 June 2010. » The requirement for potential impact on the environment of listed activities must be considered, investigated, assessed, and reported on to the competent authority (S24 – Environmental Authorisations). » Duty of Care (S28) requiring that reasonable measures are taken to prevent pollution or degradation from occurring, continuing or recurring, or, where this is not possible, to minimise and rectify pollution or degradation of the environment. » Procedures to be followed in the event of an emergency incident which may affect the environment (S30).
Environment Conservation Act (Act No 73 of 1989)	<ul style="list-style-type: none"> » National Noise Control Regulations (GN R154 dated 10 January 1992).
National Heritage Resources Act (Act No 25 of 1999)	<ul style="list-style-type: none"> » Stipulates assessment criteria and categories of heritage resources according to their significance (S7). » Provides for the protection of all archaeological and palaeontological sites, and meteorites (S35). » Provides for the conservation and care of cemeteries and graves by SAHRA where this is not the responsibility of any other authority (S36). » Lists activities which require developers any person who intends to undertake to notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development (S38). » Requires the compilation of a Conservation Management Plan as well as a permit from SAHRA for the presentation of archaeological sites as part of tourism attraction (S44).
National Environmental Management: Biodiversity Act (Act No 10 of 2004)	<ul style="list-style-type: none"> » Provides for the MEC/Minister to identify any process or activity in such a listed ecosystem as a threatening process (S53)

Legislation	Applicable Sections
	<ul style="list-style-type: none"> » A list of threatened and protected species has been published in terms of S 56(1) - Government Gazette 29657. » Three government notices have been published, i.e. GN R 150 (Commencement of Threatened and Protected Species Regulations, 2007), GN R 151 (Lists of critically endangered, vulnerable and protected species) and GN R 152 (Threatened or Protected Species Regulations). » Provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection, (G 34809, GN 1002), 9 December 2011). » This Act also regulates alien and invader species. » Under this Act, a permit would be required for any activity which is of a nature that may negatively impact on the survival of a listed protected species.
National Environmental Management: Air Quality Act (Act No 39 of 2004)	<ul style="list-style-type: none"> » Measures in respect of dust control (S32) – no regulations promulgated yet. » Measures to control noise (S34) - no regulations promulgated yet.
Conservation of Agricultural Resources Act (Act No 43 of 1983)	<ul style="list-style-type: none"> » Prohibition of the spreading of weeds (S5) » Classification of categories of weeds & invader plants (Regulation 15 of GN R1048) & restrictions in terms of where these species may occur. » Requirement & methods to implement control measures for alien and invasive

Legislation	Applicable Sections
	plant species (Regulation 15E of GN R1048).
National Water Act (Act No 36 of 1998)	<ul style="list-style-type: none"> » National Government is the public trustee of the Nation's water resources (S3). » Entitlement to use water (S4) – entitles a person to use water in or from a water resource for purposes such as reasonable domestic use, domestic gardening, animal watering, fire fighting and recreational use, as set out in Schedule 1. General Authorisation Government Gazette No. 20526 8 October 1999 is of relevance. » Duty of Care to prevent and remedy the effects of pollution to water resources (S19) » Procedures to be followed in the event of an emergency incident which may impact on a water resource (S20). » Definition of water use and requirement for water use licenses for certain activities (S21) » Requirements for registration of water use (S26 and S34). » Definition of offences in terms of the Act (S151).
National Environmental Management: Waste Act (Act No 59 of 2008)	<ul style="list-style-type: none"> » The purpose of this Act is to reform the law regulating waste management in order to protect health and the environment by providing for the licensing and control of waste management activities. » The Act provides listed activities requiring a waste license.
National Forests Act (Act No 84 of 1998)	<ul style="list-style-type: none"> » Protected trees: According to this act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. The prohibitions provide that 'no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister'. » Forests: The Act prohibits the destruction of indigenous trees in any natural forest without a licence.

Legislation	Applicable Sections
<p><u>GN727: Declaration Of Kathu Forest as a Protected Woodland Under Section 12(1)(C) of The National Forests Act, 1998 (Act No 84 Of 1998).</u></p>	<ul style="list-style-type: none"> » <u>Minister of Agriculture, Forestry and Fisheries hereby declares the Kathu forest as a Protected Woodland in terms of section 12 (1)(c) of the National Forests Act,1998 (Act No 84 of 1998).</u> » <u>In terms of section 15(1) of the National Forests Act, 1998, no person may.</u> <ul style="list-style-type: none"> a) <u>Cut, disturb, damage or destroy any protected tree; or</u> b) <u>Possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, or any forest product derived from a protected tree, except:</u> <ul style="list-style-type: none"> (i) <u>under a license granted by the Minister; or</u> (ii) <u>in terms of an exemption from the provisions of this subsection published by the Minister in the Gazette.</u>
Provincial Legislation	
<p>Northern Cape Nature Conservation Act, Act No. 9 of 2009</p>	<ul style="list-style-type: none"> » This Act provides for the sustainable utilisation of wild animals, aquatic biota and plants; provides for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora; provides for offences and penalties for contravention of the Act; provides for the appointment of nature conservators to implement the provisions of the Act; and provides for the issuing of permits and other authorisations. Amongst other regulations, the following may apply to the current project: <ul style="list-style-type: none"> * Boundary fences may not be altered in such a way as to prevent wild animals from freely moving onto or off of a property; * Aquatic habitats may not be destroyed or damaged; * The owner of land upon which an invasive species is found (plant or animal) must take the necessary steps

Legislation	Applicable Sections
	<p>to eradicate or destroy such species.</p> <p>» The Act provides lists of protected species for the Province.</p>
Guideline Documents	
<p><u>Northern Cape Provincial Spatial Development Framework / Development & Resource Management Plan</u></p>	<p>» <u>An over-arching provincial policy and strategy that:</u></p> <ol style="list-style-type: none"> <u>1. Provides direction and guidance pertaining to future land use in the province.</u> <u>2. Reconciles and provides spatial context for provincial sectoral strategies.</u> <u>3. Promotes a 'developmental state' in accordance with legislation policy.</u> <u>4. Aligns environmental management in the Northern Cape with applicable international agreements, protocols and conventions.</u> <u>5. Gives effect to the overarching intent of the Northern Cape Provincial Growth and Development Strategy (PGDS) to 'build a prosperous, sustainable and growing provincial economy to eradicate poverty and improves social development'.</u>
<p>Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads</p>	<p>» Outlines the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits.</p>
Policies and White Papers	
<p>The White Paper on the Energy Policy of the Republic of South Africa (December 1998)</p>	<p>» Investment in renewable energy initiatives, such as the proposed solar energy facility, is supported by this white Paper.</p>
<p>The White Paper on Renewable Energy (November 2003)</p>	<p>» This Paper sets out Government's vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa.</p>

One of the latest tools used to assist Planners at all levels is the Bioregional Plan⁵ (drafted for the Namakwa District). The Northern Cape Department has however prioritised the development of the Provincial Conservation Plan of which a phase

⁵ Bioregional planning and land management promotes sustainable development within a specific geographical area (i.e. the bioregion), the boundaries of which are determined in accordance with environmental, social and economic criteria.

of the first draft will be completed in 2012/2013 (DENC Annual Performance Plan 2012/2013).

3.2. Methodology for the Scoping Phase

Key tasks undertaken within the scoping Phase are illustrated in Figure 3.1 and are discussed in further detail below.

3.2.1 Authority Consultation and Application for Authorisation in terms of GN No R543 of 2010

As this is an energy generation project, National DEA is the competent authority (authorising body) for this application. As the project falls within the Northern Cape, DENC will act as the primary commenting authority for the application. Consultation with both these authorities has been undertaken throughout the Scoping process and has included the following:

- » Consultation with DEA regarding the proposed project and the Scoping/EIA process to be undertaken.
- » Submission of an application for authorisation to DEA with a copy submitted to DENC. This application was accepted and issued with the DEA reference number **14/12/16/3/3/2/273**.

A record of all authority consultation is included within Appendix B.

3.2.2. Public Participation Process

The public participation process was undertaken by Sustainable Futures ZA (the contracted public participation specialist). The aim of the public participation process is primarily to ensure that information containing all relevant facts in respect of the application is made available to potential stakeholders and I&APs. Furthermore, participation by potential I&APs is facilitated in such a manner that all potential stakeholders and I&APs are provided with a reasonable opportunity to comment on the application. And lastly, all comments received from stakeholders and I&APs are recorded which serve to further direct the specialist studies and the EIA process (refer to Figure 3.2).

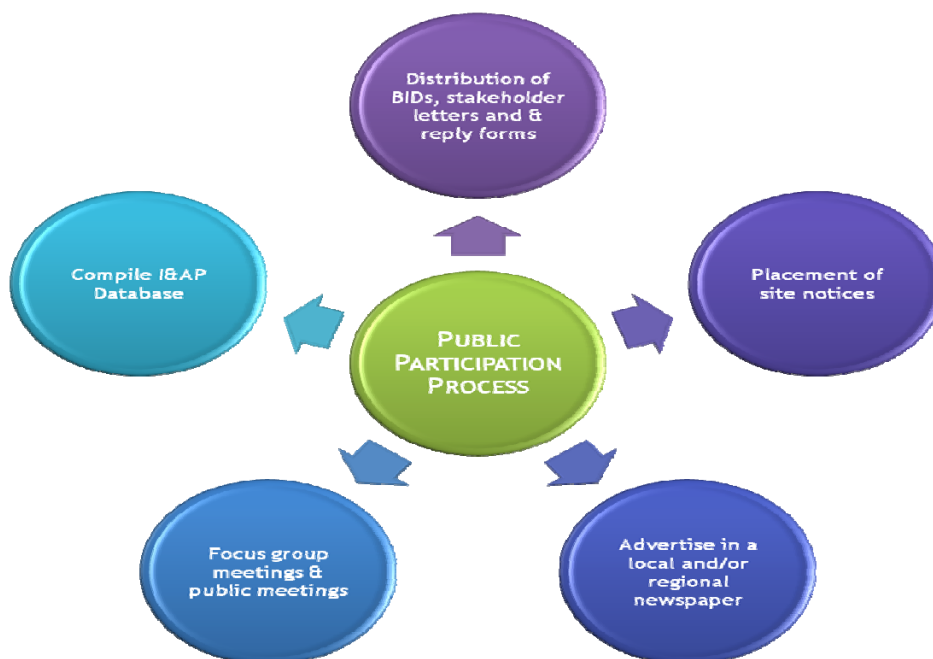


Figure 3.2 Activities included as part of the public participation process

Identification of I&APs and establishment of a Database

Identification of I&APs was undertaken through existing contacts and databases, recording responses to newspaper advertisements as well as through the process of networking. The key stakeholder groups identified include:

- » Provincial and local government departments
- » Government structures (including the provincial roads authority, municipal planning departments, etc)
- » Officials from the Gamagara Local Municipality and Kgalagadi District Municipality as well as Ward Councillors
- » Potentially affected and neighbouring landowners
- » Conservation authorities
- » Industry and business
- » CBOs and other NGOs.

Stakeholder and I&AP details were recorded within an I&AP database which will be updated on an on-going basis during the EIA process (refer to Appendix C).

Newspaper Advertisements

In order to notify and inform the public of the proposed project and invite them to register as I&APs, a media notice was placed in the Gemsbok regional newspaper on the 07 March 2012. The media notice informed the public of the EIA process,

the public meeting and the review period for the Draft Scoping Report (refer to Appendix C1).

Distribution of Background Information Documents, Stakeholder Letters, and Reply Forms

In order to provide information regarding the proposed project and the EIA process, Background Information Documents (BIDs), stakeholder letters and reply forms were compiled and distributed (refer to Appendix B2 and C2). The BIDs were distributed to identified stakeholders and I&APs, and additional copies were made available at public venues within the broader study area.

Meetings

I&APs were invited to attend a public meeting on the 02 April 2012. This meeting which was advertised in the Gemsbok newspaper on 07 March 2012 and stakeholders were invited by email/telephonically to attend the focus group meeting.

Other forms of Public Involvement

Key stakeholders were notified in writing of the commencement of the EIA process and the availability of the Draft Scoping Report which included, *inter alia*:

- » Relevant parties from the local and district municipalities which are potentially affected (directly or indirectly) by the proposed project
- » Communities and potentially affected and neighbouring landowners
- » Organs of state having jurisdiction in respect of any aspect of the activity, including:
 - * Department of Energy
 - * Department of Water Affairs
 - * Northern Cape Nature Conservation
 - * South African Heritage Resources Agency
 - * Wildlife Environment of Southern Africa
 - * Department of Transport and Public Works
 - * South African National Roads Agency
 - * Department of Land Affairs
 - * Gamagara Local Municipality
 - * Kgalagadi District Municipality.

Through consultation with key stakeholders and I&APs, issues for inclusion within the scoping study were identified and confirmed. Various opportunities will be provided for I&APs to have their issues noted following the release of the Draft Scoping Report, this would include:

- » One-on-one consultation meetings

- » Telephonic consultation sessions and written, faxed or e-mail correspondence with I&APs (i.e. consultation with various parties from the EIA project team, including the developer, the public participation consultant, and the lead EAP).

Networking with I&APs will continue throughout the duration of the Scoping and EIA Phases.

3.2.3. Identification and Recording of Issues and Concerns

Issues and comments raised by I&APs over the duration of the EIA process have been synthesised into a Comments and Response report. The Comments and Response reports include responses from members of the EIA project team and/or the project proponent. Where issues are raised that the EIA team considers beyond the scope and purpose of this EIA process, clear reasoning for this view is provided.

Following the public review period, the comments will be addressed and will be consolidated in the Comments and Response Report which will be included in this Final Scoping Report as submitted to DEA (Refer to **Appendix C5: Issues and Response Register**). The Comments and Response Report will include responses from members of the EIA project team and/or the developer to either indicate how the issues will be addressed in the EIA Phase, or to provide clarification. Where issues are raised that the EIA team considers beyond the scope and purpose of this EIA process, clear reasoning for this view will be provided.

3.2.4. Evaluation of Issues Identified through the Scoping Process

Potential direct and indirect environmental impacts that are identified within the Scoping process have been evaluated through desk-top studies. In order to evaluate issues and assign an order of priority, it was necessary to identify the characteristics of each potential issue/impact:

- » *The nature*, which includes a description of what causes the effect, what will be affected and how it will be affected.
- » *The extent*, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development) or regional.

The evaluation of the issues resulted in a statement regarding the potential significance of the identified issues, as well as recommendations regarding further studies required within the EIA phase of the process.

3.2.5. Public Review of Draft Scoping Report and Feedback Meeting

The Draft Scoping Report was made available for public review from 16 March 2012 to 17 April 2012 at the following locations:

- » www.savannahsa.com
- » Kathu Public Library, Main road, Kathu.
- » Dibeng Public Library.

In order to facilitate comments on the Draft Scoping Report, a public feedback meeting was held during the review period for the Draft Scoping Report as follows:

Date: 02 April 2012
Venue: Namakwari Lodge, 1 Frikkie Meyer Road, Kathu
Time: 18:00pm - 19:30pm

3.2.6. Final Scoping Report

This is the **final and current stage** in the Scoping Phase and entails the capturing and addressing of responses from I&APs on the Draft Scoping Report. It is this final report upon which the decision-making environmental authorities provide comment, recommendations, and acceptance to undertake the EIA Phase of the process.

Interested and Affected Parties have been invited to review the amended Final Scoping Report and submit comments directly to National DEA.

DESCRIPTION OF THE RECEIVING ENVIRONMENT

CHAPTER 4

This section of the Final Scoping Report provides a description of the environment that may be affected by the proposed San Solar Energy Facility. This information is provided in order to assist the reader in understanding the receiving environment within which the proposed facility is located. Features of the biophysical, social, and economic environment that could directly or indirectly be affected by, or could affect, the proposed development have been described. This information has been sourced from both existing information available for the area as well as collected field data, and aims to provide the context within which this EIA is being conducted.

4.1 Regional Setting: Location of the Study Area

The study site is located on the remaining extent of the Farm Wincanton 472 within the north-eastern region (Kalahari and Diamond Fields Region) of the Northern Cape. The site lies approximately 5km east of Dibeng, 16 km north-west of Kathu, 200 km north-east of Upington and 280 km north-west of Kimberley. The site lies on either side of the Dibeng-Kathu tar road, which branches off the R380 Kathu-Hotazel road.

4.2 Climatic Conditions

The arid climate of the study area is typical of the Karoo interior, characterised by low, generally summer rainfall distribution, warm to hot summers and cold to very cold winters. Very warm temperatures of above 40°C may be experienced in summer, while frost in winter is not common, but may occur occasionally. Mean annual precipitation for this region is less than 200 mm and the annual potential evaporation is in excess of 2500 mm.

4.3. Biophysical Characteristics of the Study Area

4.3.1 Topographical Profile

The average elevation for the broader area is approximately 1130 metres above sea level. The broader region has a gently westerly sloping topography towards the Ga Mogara River (a seasonally dry river bed that very occasionally flows in a south to north direction through Dibeng). A few minor ephemeral tributaries drain the proposed study area in a westerly direction towards this river.

4.3.2 Geological Profile

The bedrock geology of the broader area is covered by Quaternary red-brown wind-blown sands of the Gordonia Formation. Localised outcrops of dolomite, banded ironstone, chert, shale, quartzite, conglomerate, tillite of the Dolomite series, quartzite, shale, tillite, andesite, chert, jaspillite, limestone of the Pretoria Series, and lava, sandstone, conglomerate, sandstone, greywacke of the Waterberg System protrude through the sand cover within the broader area, but outside of the study site. Further to this, aerial photography indicates that rock outcrops are sparse in this area, and that the majority of the study area is covered in Quaternary unconsolidated sands.

4.3.3 Ecological Profile

The study area falls within the Karoo Biome with the single vegetation type occurring in the area (i.e. Kathu Bushveld) which extends in all directions from the site. This vegetation type occurs on the extensive, relatively flat plains between Kathu and the border of Botswana. It is characterised by open plains with Sheperd's Trees as the most prominent-occurring tree species, with Camel Thorn trees occurring in places. The shrub layer is generally the most important component of this vegetation type, dominated by species such as Black Thorn Acacia, Star Apple and Karee Thorn, while the grass layer is variable in cover.

Camel Thorn is relatively common in the area. Where the proposed infrastructure impacts on any individuals, a permit would need to be obtained for any protected trees that are affected, so a legal obligation remains to determine the presence of protected trees within the development footprint irrespective of the significance of the impact.

At a national scale Kathu Bushveld has been transformed by only a small amount and is therefore not considered to be a threatened vegetation type.

The site is not known to harbour alien plants in significant numbers. Mesquite is a potential problem in this region and can easily invade disturbed sites, after which it becomes difficult to eradicate and spreads into surrounding vegetation. There is therefore a potential for alien species to spread or become established within the servitude following disturbance on site.

Red Data Species

There are two species on the Red Data List⁶, both listed as Declining, which have a high probability of occurring on the study site, namely Camel Thorn and Wild Ghaap (*Hoodia gordonii*).

There are five mammal species of conservation concern that could occur in available habitats in the study area. This includes three species classified as near threatened (NT), i.e. the Honey Badger, the Southern African Hedgehog and Schreiber's Long-fingered Bat, and two species classified as data deficient (DD).

There are three threatened bird species, which are classified as Vulnerable (VU), that have a medium chance of utilising available habitats in the study area, either for foraging or breeding. The species most likely to use parts of the site for breeding is the Kori Bustard.

No frog or reptile species of conservation concern previously recorded in the grids in which the study area is located are likely to occur on site.

Protected Trees

Tree species protected under the National Forest Act that have a geographical distribution that includes the study area are Camel Thorn, Grey Camel Thorn and Shepard's Tree.

Camel Thorn occurs in dry woodland areas along watercourses in arid areas where underground water is present as well as on deep Kalahari sands. Grey Camel Thorn occurs on deep Kalahari sand between dunes or along dry watercourses. Shepherd's Tree occurs in semi-desert areas and bushveld, often on termitaria, but is common on sandy to loamy soils and calcrete soils (mostly Bushmanland Arid Grassland). Both Camel Thorn and Shepard's Tree are relatively common in the study area.

4.3.4 Existing Land Cover

The majority of the proposed site is covered in thicket. In addition to thicket the site includes:

⁶ These are lists of species whose continued existence is threatened. Red Data Book species are classified into different categories of perceived risk. The threatened species categories now used in Red Data Books and Red Lists have been in place, with some modification, for almost 30 years. Since their introduction these categories have become widely recognised internationally, and they are now used in a whole range of publications and listings, produced by IUCN as well as by numerous governmental and non-governmental organisations.

- » A quarry ~150m² in size is located ~500m from the southern boundary of the site.
- » A reservoir located centrally on the proposed site.
- » Wet zones located towards the south and south west of the proposed site.
- » A Woodland area located north east of the proposed site.

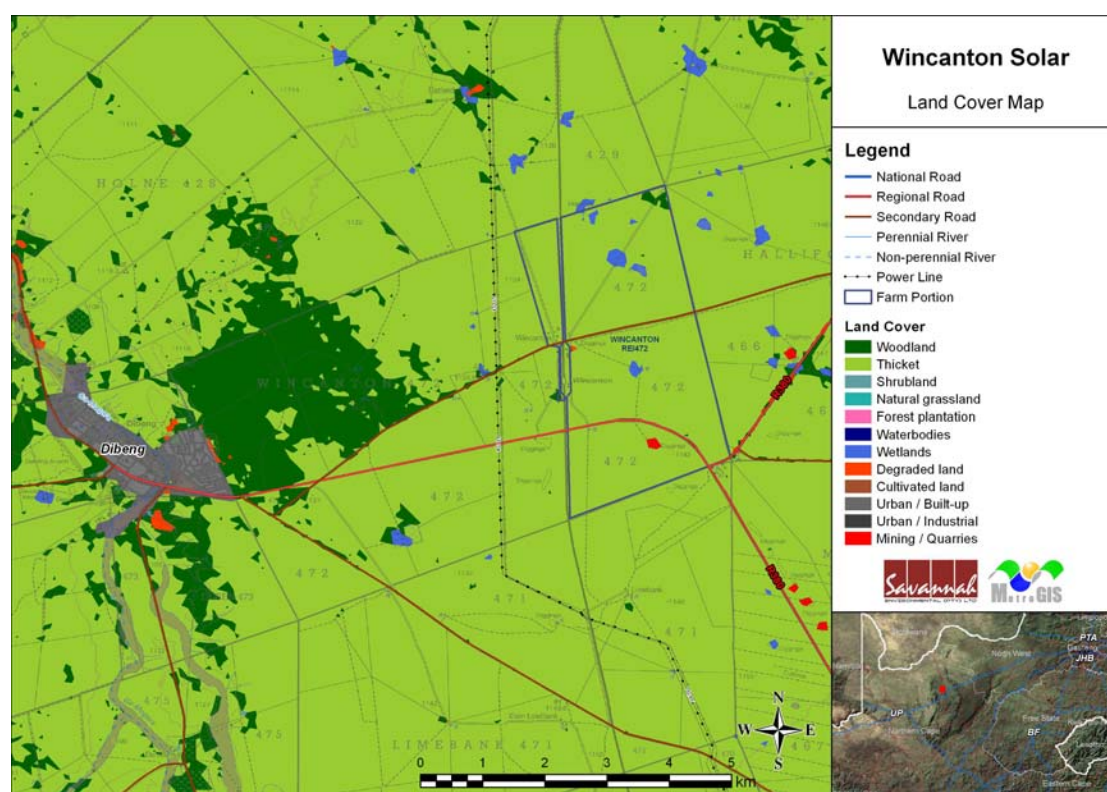


Figure 4.1: Land Cover for the proposed San Solar facility site, as well as the broader study area

4.3.5 Agricultural Potential

Much of the area comprises either shallow to very shallow (<300 mm deep) soils. The low rainfall in the area means that the only means of cultivation would be by irrigation, and no signs of agricultural infrastructure and/or irrigation have been identified from aerial photography, however this will be confirmed during the EIA Phase. Due to the climatic restrictions, this part of the Northern Cape is suited at best for low density grazing practices at around 40 - 50 ha/large stock unit.

4.4. Social Characteristics of the Study Area and Surrounds

The broader study area is characterised by an abundance of mineral resources (i.e. tungsten and iron) and therefore mining comprises a prominent land-use in the broader area. Since the mid-nineties, the Northern Cape has experienced an

influx of people from the rural areas to the towns in search of improved quality of life and employment opportunities. The area has experienced some population growth due to the expansion of the Kumba Sishen Iron Ore Mine and the establishment of the new Khomani Mine in Kathu. This created some social challenges, especially in terms of crime prevention, providing the necessary infrastructure and limiting the growth of informal settlements without basic services. As the majority of the total population in the area are South Africans, one could conclude that there is some population stability in the study area with no socio-economic challenges created by an inflow of immigrants.

The farm Wincanton 472 falls within Ward 1 of the Gamagara Local Municipality, which serves the communities of Kathu, Sesheng, Sishen, Dibeng and Olifantshoek. The town of Kathu was established in 1974 and represents the Northern Cape's iron ore centre. The railway line from Sishen to Saldanha Bay is mainly used to transport iron ore to its export market.

One of the main socio-economic challenges relates to the prevention of the spread of HIV/Aids and TB. Different programmes have been implemented by the Kgalagadi District Municipality, as well as the Gamagara Local Municipality to combat the spread of the diseases. There is a significant backlog in the provision of housing and shelter to informal dwellers, especially amongst the residents of Dibeng and Olifantshoek, and this remains a socio-economic challenge for the municipality.

4.4.1 Demographic Profile

The age structure of the District and Local Municipalities in the study area indicates a predominantly young population with a small percentage of the population in the 60+ age category. This young population indicates a definite need for social activities, services, youth development, training opportunities and job creation in the region.

Approximately 2 282 people in the Gamagara Local Municipal area do not have any form of schooling, with only 2 852 individuals having completed Grade 12 or a similar level of education and just over 300 people have a higher form of education. One can assume that a large part of the population in the municipal area would have the necessary level of education and/or skills to undertake semi-skilled work, but not necessarily those living in Ward 1. The low percentages of individuals with higher forms of education could be attributed to the lack of tertiary educational facilities in the region.

4.4.2 Economic Profile

The Northern Cape has the smallest economy of the nine provinces. The Gross Geographic Product (GGP) represents approximately 1.8% of South Africa's Gross Domestic Profit (GDP). The trade sector, transport and finance industries also comprise a share in the provincial economy and promising industries include tourism, fishing and mariculture.

Income distribution is an important indicator of an area's welfare, as it determines the ability to meet basic needs and it provides information on the poverty levels in the area. The majority of the people living in the Kgalagadi District Municipality have no income or earn below R800.00 per month. These figures correlate with the high unemployment rates and also show high levels of dependency and poverty due to the fact that the majority of the economically active population has an income of below R800.00 per month. Out of the population of 185 297 people in the Kgalagadi District Municipality, only 21 584 are employed, 17 511 are unemployed and 66 645 people are economically inactive. In the Gamagara Local Municipality, 5 896 people are employed, while 2 410 were unemployed. In Ward 1, 560 people are employed, but 893 are unemployed. According to the Kgalagadi District Municipality's Strategic Environmental Assessment and Integrated Environmental Management Programme, Ward 1 is the ward with the poorest statistics with regards to their social, infrastructural and economic status quo.

Due to the above high unemployment rate and the lack of service provision as well as economic and educational opportunities, the area has been earmarked as a presidential rural node under the Integrated Sustainable Rural Development Programmes (ISRDPs).

4.4.3 Heritage

The archaeological record of this region reflects the long span of human history from Earlier Stone Age through the Middle Stone Age to the Later Stone Age. The last 2 000 years was a period of increasing social complexity with the appearance of farming activities (herding and agriculture) alongside foraging and ceramic/metallurgical (Iron Age) technologies alongside an older trajectory of stone tool making.

At a local level, there is evidence of early mining of specularite, a sparkling mineral that was used in cosmetic and ritual contexts in from early times. Rock art is also evident in the form of rock engravings.

At a regional level, the sites of Wonderwerk Cave (east side of the Kuruman Hills) and the Kathu complex of sites provide important sequences against which to assess the age and significance of finds that may be made on the identified site for the proposed facility.

SCOPING OF ISSUES

CHAPTER 5

The potential impacts of the predominant phases of the proposed development (i.e. construction and operation) are identified, described, and evaluated in this chapter. The majority of the environmental impacts are expected to occur during the construction phase for a facility of this nature.

5.1 Methodology for Impact Assessment during the Scoping Phase

The following methodology was used to determine the main issues and potential impacts of the proposed project during these phases:

- » Identify sensitive environments and receptors that may be impacted on by the proposed facility and the types of impacts (i.e. direct, indirect, and cumulative⁷) that are most likely to occur.
- » Determine the nature and extent of potential impacts during the construction and operational phases.
- » Identify 'No-Go' areas, if applicable.
- » Summarise the potential impacts that will be considered further in the EIA Phase through specialist assessments. Table 5.1 and 5.2 summarise the findings of the Scoping Phase undertaken for the construction and operation phases of the proposed development (the pre-construction and decommissioning phases will be discussed in further detail in the EIA Phase).
- » Develop a scoping matrix to identify which activities may potentially affect the surrounding environment/receptors. This provides a snapshot of the potential impacts associated with these phases and the recommendations for studies required within the EIA Phase).

5.2. Sensitive Environments and Receptors

The proposed facility has the potential to have an impact on the following environmental receptors (prior to the implementation of mitigation measures):

- » **Ecology, fauna, and flora:** the disturbance associated with activities during the construction phase may affect flora and fauna populations through disturbance or destruction of potential habitat. During the operational phase, regular maintenance activities may affect fauna due to disturbance.

⁷ The cumulative impacts are expected to be associated with the scale of the project and any existing impacts affecting the study area. Cumulative effects can only be assessed once the detailed layouts are known. They will then be considered in the detailed specialist studies to be undertaken in the EIA Phase.

- » **Agricultural potential:** construction activities such as excavations and the presence of construction equipment on site may lead to soil pollution which could affect the agricultural potential and land capability of the area. Furthermore the utilisation of the development footprint would indicate that the area could not be utilised for agricultural purposes during the operational phase.
- » **Erosion potential:** excavation activities during the construction phase and water run-off during the operational phase has the potential to affect the soil conditions and erosion potential of the site.
- » **Heritage sites and fossils:** disturbance to or destruction of heritage sites and fossils may result during the construction phase.
- » **Visual quality and aesthetics:** The construction and operation of the PV facility, and particularly the associated infrastructure (i.e. power lines) has the potential to impact on the visual quality of the landscape.
- » **Social characteristics:** The construction and operational phases of the proposed facility may result in both temporary and/or longer term employment opportunities, most likely to be of a basic and semi-skilled nature. The influx of construction workers and/or potential job seekers could impact on existing infrastructure and social behaviour such as crime and the spread of diseases within local communities.

5.3. Cumulative impacts

The cumulative impacts associated with the proposed PV plant are expected to be associated with the extent of the proposed San Solar Energy Facility development, as well as other PV facility developments in the immediate area (two of which have already received Environmental Authorisation). At this stage, the number of facilities that would actually be established is unclear as this is dependent on each project being selected by the Department of Energy through a tendering process. Developers who have been awarded status as a preferred bidder through this process are only likely to have facilities that may be developed. Prior to construction these facilities are still required to obtain a number of licences and approvals in terms of South African Legislation. In terms of the proposed San Solar Energy Facility, the Kathu Solar Energy Facility and the Sishen Solar Energy Facility are on adjacent properties. Both of these projects have been awarded preferred bidder status by the Department of Energy. The development of the all three projects in this area will result in a solar energy hub for the Northern Cape and will concentrate solar projects in single area.

The potential direct cumulative impacts associated with the project are expected to be associated predominantly with the potential visual impact on the surrounding area as well as impacts on vegetation (and the protected Camel

Thorn tree). As required in terms of the EIA Regulations, cumulative effects will be considered in the detailed specialist studies to be undertaken in the EIA phase.

5.4. Assumptions made during the evaluation of Potential Impacts

While evaluating potential impacts associated with the proposed project, it was assumed that the development footprint (the area that will be affected during the operational phase) will include the footprints for the solar components (i.e. PV panels), the substation (i.e. the on-site substation), and associated infrastructure (i.e. internal access roads and overhead power line). However, during the construction phase, the entire extent of the broader site required for the proposed facility could suffer some level of disturbance. This is referred to as the construction footprint.

Table 5.1: Evaluation of potential impacts associated with the **construction phase**

Impacts on fauna, flora and ecology		
<p>The study area falls within the Karoo Biome with a single vegetation type occurring in the area (i.e. Kathu Bushveld) which extends in all directions from the site. At a national scale Kathu Bushveld has been transformed by only a small amount and is therefore not considered to be a threatened vegetation type.</p> <p>There are two species on the Red Data List, both listed as Declining, which have a high probability of occurring on the study site, namely Camel Thorn and Wild Ghaap. There are five mammal species of conservation concern that could occur in available habitats in the study area. This includes three species classified as near threatened (NT), i.e. the Honey Badger, the Southern African Hedgehog and Schreiber's Long-fingered Bat, and two species classified as data deficient (DD). There are three threatened bird species, which are classified as Vulnerable (VU), that have a medium chance of utilising available habitats in the study area, either for foraging or breeding. The species most likely to use parts of the site for breeding is the Kori Bustard. No frog or reptile species of conservation concern previously recorded in the grids in which the study area is located are likely to occur on site.</p> <p>Tree species protected under the National Forest Act that have a geographical distribution that includes the study area are Camel Thorn, Grey Camel Thorn, and Shepard's Tree.</p> <p><u>There is the potential for cumulative impacts with the development of numerous facilities in the area.</u></p>		
Issue	Nature of Impact	Extent of Impact
Impacts on indigenous natural vegetation	Construction of the PV panels and the associated infrastructure will lead to direct loss of vegetation which, in turn, will lead to localised or more extensive reduction in the overall extent of the vegetation type. Although the Kathu Bushveld is considered as Least Threatened, where this vegetation has already been stressed (i.e. through degradation and transformation at a regional level), the loss of indigenous natural vegetation may lead to increased vulnerability (susceptibility to future damage) of the habitat and a change in the conservation status.	Local – Regional
Impacts on threatened plants	Flora is affected by overall loss of habitat but is especially vulnerable to infrastructure development as species cannot move out of the path of the construction activities. In the case of threatened plant species a loss of a population or individuals could lead to a direct change in the conservation status of the species. This may arise if the proposed	Local

	infrastructure is located where it will affect such individuals or populations.	
Impacts on protected tree species	According to the National Forests Act no person may cut, disturb, damage or destroy any listed protected tree species. The protected tree species that have a geographic distribution that includes the study site would also merit this protection. Any of these protected species could occur in any part of the study area, depending on local conditions. It is, however, most likely that they would occur in drainage areas or at the base of mobile dunes.	Local
Impacts on threatened animal species	Threatened species include those classified as critically endangered, endangered, or vulnerable. In the case of threatened animal species, loss of a population or individuals could lead to a direct change in the conservation status of the species. This may arise if the proposed infrastructure is located where it will affect such individuals or populations or the habitat that they depend on. They could be indirectly affected, primarily by the overall loss of habitat, since direct construction impacts can often be avoided due to movement of individuals from the path of construction.	Local - Regional
Impacts on pans	The site is in a very arid area and therefore there are unlikely to be any wetlands occurring on the site. However, there are a number of small pans located on the site and construction activities may lead to some direct or indirect loss of or damage to some of these areas or changes to their relative catchments. This may lead to loss of habitat for species that depend on this habitat type. Pans may possibly be important habitat for a number of species in the study area, including those with a restricted distribution.	Local
Change in runoff and drainage patterns	The development of construction sites and roads can cause local hydrological and erosion effects resulting in major peak-flow and sediment impacts. This may occur where the infiltration rates of the landscape are changed due to an impermeable surface being constructed. The associated increase in runoff may increase the rates and extent of erosion, reduce percolation and aquifer recharge rates, alter channel morphology and increase stream discharge rates. There are no steep slopes or drainage lines occurring on the site and the rainfall in this area is very low. Therefore the potential effect on the hydrology of the landscape is relatively small.	Local - Regional

<p>Establishment and spread of declared weeds and alien invader plants</p>	<p>A major factor contributing to invasion by alien invader plants includes the high disturbance related to construction activities of such a facility). Consequences of this may include:</p> <ul style="list-style-type: none"> » Loss of indigenous vegetation » Change in vegetation structure leading to change in various habitat characteristics » Change in plant species composition » Change in soil chemical properties » Loss of sensitive habitats » Loss or disturbance to individuals of rare, endangered, endemic and/or protected species » Fragmentation of sensitive habitats » Change in flammability of vegetation, depending on alien species » Hydrological impacts due to increased transpiration and runoff » Impairment of wetland function. <p>It is not known to what extent the site currently contains alien plants. This will be confirmed through field surveys during the EIA Phase. Potential weeds with a distribution centred on arid regions of the country include Russian Thistle, Sponge-Fruit Salt Bush, Sweet Prickly Pear, Prickly Pear, Honey Mesquite, Velvet Mesquite, Old Man Saltbush, and Wild Tobacco.</p>	<p>Local - Regional</p>
<p>Gaps in knowledge & recommendations for further study</p> <p>The quantity and quality of floristic data for the study area is poor as this an extremely under collected area floristically speaking and the local flora is not well documented. There may therefore be species that have not been previously collected in this area.</p> <p>The following activities will be undertaken as part of the ecological specialist study during the EIA Phase which are relevant to the construction phase:</p> <ul style="list-style-type: none"> » Conduct a site visit in order to assess the general vegetation condition of the site and to identify areas that are in good condition versus those areas in poor condition. This will provide the context for assessing impacts on natural vegetation. » The presence and distribution of wetlands (i.e. such as the pans) on site will be confirmed. This will be done primarily using aerial photograph interpretation, but will be confirmed in the field. This will provide a "red flag" with respect to whether such features occur on 		

- site or not and their approximate location, if they occur. The wetland areas will have an ~ 50m buffer from any construction activity. The need for Wetland delineation will be confirmed in the EIA Phase of this study. Note there is preliminary indication of wet areas present to the north west of the site.
- » The presence of species of concern will be evaluated. For plant species this will be done by searching for populations that could occur in the study area based on habitat requirements and historical collection records. For animal species this will be done by assessing habitat suitability for those species that have been assessed as potentially occurring in the area. Particular attention will be paid to those species classified as threatened, including the three mammal species classified as near threatened (the Honey Badger, Schreiber's Long-fingered Bat and the Southern African Hedgehog) and the three bird species, of which one potentially has a medium likelihood of using the site for breeding (Kori Bustard) and another two (Martial Eagle and African Whitebacked Vulture) may use the site for foraging, but it is unknown until the site is evaluated for habitat suitability.
 - » Assess the potential impacts using a weighting system that assigns a value to the categories (extent, duration, magnitude, probability) and arrives at a total which depicts the significance of the particular impact.
 - » Prepare a specialist report detailing the environmental issues and potential ecological impacts.
 - » Provide mitigating measures to input into the EMP.

Impacts on agricultural potential

Much of the study area comprises either shallow to very shallow soils onto rock. Furthermore the low rainfall in the area means that the only means of cultivation would be by irrigation. Aerial imagery of the area shows no signs of any agricultural infrastructure and none of irrigation on the proposed site. The climatic restrictions indicate that this part of the Northern Cape is suited at best for low density grazing activities at around 40 - 50 ha/large stock unit.

There is the potential for cumulative impacts with the development of numerous facilities in the area.

Issue	Nature of Impact	Extent of Impact
Loss of arable land due	The major impact on the agricultural potential of the study area would be the loss of arable land due to the construction of the various types of infrastructure. However, at the end of the project life, it is anticipated that removal of the structures would enable the land to be returned to more or less a natural state, with little impact, especially given the low prevailing agricultural potential.	Local

Gaps in knowledge & recommendations for further study
 Due mainly to the low agricultural potential of the soils and the prevailing climatic limitations for agriculture, it is extremely unlikely that a detailed soil investigation including sampling will be necessary during the EIA Phase.

Impacts on soils, erosion potential and geomorphology
 The bedrock geology of the broader area is covered by Quaternary red-brown wind-blown sands of the Gordonia Formation.

Issue	Nature of Impact	Extent of Impact
Soil degradation due to excavation	Damage of soil and associated ecosystems due to excavations arising from construction activity.	Local
Soil degradation due to wetting and compaction	Damage of soil and associated ecosystems due to wetting and compaction of soil along roads and around footprints.	Local
Soil degradation due to pollution	Damage of soil and associated ecosystems due to spillage of hazardous chemicals such as fuel on construction sites.	Local
Soil degradation due to accelerated erosion (water or wind)	Loss of soil and damage to associated ecosystems due to erosion of soil in areas of activity.	
Soil degradation due to siltation downstream/downwind	Damage of soil and associated ecosystems due to siltation arising from accelerated erosion associated with construction activities.	Regional

Gaps in knowledge & recommendations for further study
 The following activities will be undertaken as part of the Soils and Erosion Potential Specialist Study during the EIA Phase:

- » Conduct a site visit to confirm the physical and geological information collated during the Scoping Phase and to collect visual information pertaining to the soil types and their geotechnical engineering properties.
- » Assess the present state of erosion, identify critical areas in terms of erosion and produce a map identifying these areas.
- » Prepare a specialist report detailing the environmental issues and potential impacts pertaining to soil degradation and erosion.
- » Assess the potential impacts using a weighting system that assigns a value to the categories (extent, duration, magnitude, probability) and arrives at a total which depicts the significance of the particular impact.
- » Provide mitigating measures to input into the EMP.

Impacts on heritage resources and palaeontology

Heritage resources including archaeological sites are in each instance unique and non-renewable resources. Area and linear developments such as those envisaged can have a permanent destructive impact on these resources. The destructive impacts that are possible in terms of heritage resources would tend to be direct, once-off events occurring during the initial construction period. In the long term, the proximity of operations in a given area could result in secondary indirect impacts resulting from the movement of people or vehicles in the immediate or surrounding vicinity.

There is the potential for cumulative impacts with the development of numerous facilities in the area.

Issue	Nature of Impact	Extent of Impact
Land clearing	Area impacts are possible in the case of proposed substation site and development footprints for the establishment of the PV panels.	Local
Establishment of borrow pits and/or spoil areas	Potentially associated with roads are borrow pits (if deemed necessary) which could have a major impact if heritage resources are present.	Local

Gaps in knowledge & recommendations for further study

The following activities will be undertaken as part of the heritage specialist study during the EIA Phase:

- » Conduct a site visit whereby anticipated locations for both area and linear infrastructure should be examined on foot.
- » Any identified heritage sites would be assessed (i.e. in terms of the classification of the landforms and visible archaeological traces, site attributes and value assessment) relative to the known heritage of the region, providing a quantifiable measure for defining significance as a basis for recommendations to be made.
- » Assess any nineteenth- and twentieth-century cultural history and intangible heritage values.
- » With regard to fossils, a preliminary assessment of the likelihood of their occurring here should be obtained from a palaeontologist.
- » Prepare a specialist report detailing the environmental issues and potential ecological impacts.
- » Assess the potential impacts using a weighting system that assigns a value to the categories (extent, duration, magnitude, probability) and arrives at a total which depicts the significance of the particular impact.

<p>Visual impacts</p> <p>Construction related activities which could affect the overall visual aesthetics of the study site include construction of access roads and foundations, and establishment of the power line.</p> <p>Potential impacts associated with these activities include:</p> <ul style="list-style-type: none"> » Impacts on observers travelling along the main or major secondary roads (i.e. R380 & the N14) in close proximity of the proposed facility. » Impacts on potentially sensitive receptors including, among others, residents of Dibeng and individual/isolated landowners/homesteads located within areas of potential visual exposure. » The potential visual impact of the construction of ancillary infrastructure (i.e. the power line, substation, and internal access roads) on observers in close proximity of the facility. » The potential visual impact of operational, safety and security lighting of the facility at night on observers residing in close proximity of the facility. » The visual absorption capacity of the natural vegetation and the influence it has on the visual exposure of the proposed facility (i.e. potentially reducing the visual exposure and mitigating the visual impact). » Potential visual impacts associated with the construction phase. » The potential to mitigate visual impacts. 		
Issue	Nature of Impact	Extent of Impact
Visual impacts	The potential visual impact of the construction of ancillary infrastructure (i.e. the substation; associated power line and internal access roads) on observers residing in close proximity of the facility.	Local
<p>Gaps in knowledge:</p> <p>The following activities will be undertaken as part of the visual specialist study during the EIA Phase:</p> <ul style="list-style-type: none"> » Additional spatial analyses (with respect to visual distance/observer proximity, viewer incidence/viewer perception) should be undertaken in order to create a visual impact index that will further aid in determining potential areas of visual impact. This exercise should be undertaken for the core facility as well as for ancillary infrastructure, as these structures (e.g. the power line and substation) are envisaged to have varying levels of visual impact at a localised scale. Site-specific issues (which are mentioned above), and potential sensitive visual receptors should be measured against this visual impact index and be addressed individually in terms of nature, extent, duration, probability, severity and significance of visual impact. 		

Impacts on the social environment		
<p>The predominant social challenges experienced in this region include:</p> <ul style="list-style-type: none"> » Training opportunities and job creation as the reduction of poverty therefore remains the most critical challenge faced. » A definite need for social activities, services, and youth development. » Education. » Provision of basic social services including sanitation. <p>During the construction phase the potential exists for job creation and some skills development (positive impacts). However, there is also the potential for impacts on the social dynamics of the study area (negative impacts through crime and temporary intrusion of job seekers). <u>There is the potential for cumulative impacts with the development of numerous facilities in the area.</u></p>		
Issue	Nature of Impact	Extent of Impact
Employment opportunities	Employment opportunities could be created which could have some short-term positive impacts, especially if local labour would be used. At this stage it is foreseen that it would be possible to make use of local labour (e.g. from Dibeng and even Kathu) for a large section of the lower skilled construction activities which would enhance the social benefits associated with the project.	Local - Regional
Influx of people into the study areas including members of the construction crews and job seekers.	An increase in people movement could increase the security risk and fire risk in the area. Furthermore, the influx of job seekers to the construction site could lead to some negative impacts (i.e. conflict between individuals seeking work). An inflow of workers and the associated construction activities (vehicle movement, noise, dust) could result in temporary intrusion impacts.	Local
Skills development	Skills development and training during the construction phase would result in long-term benefits for those involved. If proper enhancement measures are implemented the positive impacts in this regard could be increased.	Local - Regional
Security issues	Even though no construction workers are expected to be accommodated on site, an inflow of workers could, as a worst case scenario also pose some security risks. The negative impacts associated with the inflow of workers could, however, be limited should a local labour force be used.	Local
Disturbance of	Temporary disruptions in the daily living and movement patterns of neighbouring private	Local

surrounding landowners	property owners could be foreseen, although it is anticipated that the negative impacts associated with this aspect would be minimal and could be successfully mitigated;	
<p>Gaps in knowledge & recommendations for further study</p> <p>The following activities will be undertaken as part of the social specialist study during the EIA Phase:</p> <ul style="list-style-type: none"> » A comprehensive literature review and analysis would be undertaken in order to acquire further demographic and socio-economic information concerning the receiving environment and to build on the initial profiling of the local population's socio-economic characteristics. » A site visit would be undertaken in order to gather additional primary data by means of consultation with the stakeholders and affected parties. » If available, the social impact assessment team will study and analyse the information gathered by the biophysical studies (e.g. information related to technical, environmental, economic and demographic aspects and land-use changes, impact on other facilities, services, and so forth) done in parallel with the public participation process and social studies. This would assist the social team to assess the impact of the proposed development on the direct (surrounding communities) and indirect (regional) environment. » The following variables would also be assessed: <ul style="list-style-type: none"> o Population impacts; o Community/institutional arrangements; o Conflicts between local residents and newcomers; o Individual and Family level impacts; o Community infrastructure needs; and o Intrusion impacts. » Prepare a specialist report detailing the potential social impacts. » Assess these potential impacts using a weighting system that assigns a value to the categories (extent, duration, magnitude, probability) and arrives at a total which depicts the significance of the particular impact. 		

Table 5.2: Evaluation of potential impacts associated with the **Operational Phase**

Issue	Nature of Impact	Extent of Impact
Impacts on threatened animal species	<p>Threatened species include those classified as critically endangered, endangered or vulnerable. In the case of threatened animal species, loss of a population or individuals could lead to a direct change in the conservation status of the species. This may arise if the proposed infrastructure is located where it will impact on such individuals or populations or the habitat that they depend on.</p> <p>Consequences may include:</p> <ul style="list-style-type: none"> » Fragmentation of populations of affected species » Reduction in area of occupancy of affected species » Loss of genetic variation within affected species. 	Local - Regional

	<p>These may all lead to a negative change in conservation status of the affected species, which implies a reduction in the chances of the species overall survival chances.</p>	
<p>Change in runoff and drainage patterns</p>	<p>The presence of impermeable surfaces (i.e. roads) can cause local hydrological and erosion effects resulting in major peak-flow and sediment impacts. This may occur where the infiltration rates of the landscape are changed due to an impermeable surface being constructed. The associated increase in runoff may increase the rates and extent of erosion, reduce percolation and aquifer recharge rates, alter channel morphology and increase stream discharge rates. Consequences of this may include:</p> <ul style="list-style-type: none"> » Increased loss of soil » Loss of or disturbance to indigenous vegetation, especially in wetlands/pans » Loss of sensitive habitats, especially in wetlands/pans » Loss or disturbance to individuals of rare, endangered, endemic and/or protected species » Fragmentation of sensitive habitats. <p>There are no steep slopes and few drainage lines on site and the rainfall on site is very low. Therefore the potential effect on the hydrology of the landscape is considered to be small.</p>	<p>Local - Regional</p>
<p>Gaps in knowledge & recommendations for further study</p> <p>The following activities will be undertaken as part of the ecological specialist study during the EIA Phase:</p> <ul style="list-style-type: none"> » The presence of species of concern will be evaluated. For animal species this will be done by assessing habitat suitability for those species that have been assessed as potentially occurring in the area. Particular attention will be paid to those species classified as threatened, including the three bird species, of which one potentially has a medium likelihood of using the site for breeding (Kori Bustard) and another two (Martial Eagle and African Whitebacked Vulture) may use the site for foraging, but it is unknown until the site is evaluated for habitat suitability. » Assess the potential impacts using a weighting system that assigns a value to the categories (extent, duration, magnitude, probability) and arrives at a total which depicts the significance of the particular impact. 		

- » Prepare a specialist report detailing the environmental issues and potential ecological impacts.
- » Provide mitigating measures to input into the EMP.

Impacts on agricultural potential

Much of the study area comprises either shallow to very shallow soils onto rock. Furthermore the low rainfall in the area means that the only means of cultivation would be by irrigation and aerial imagery of the area shows no signs of any agricultural infrastructure and none of irrigation. The climatic restrictions mean that this part of the Northern Cape is suited at best for low density grazing activities at around 40 - 50 ha/large stock unit.

There is the potential for cumulative impacts with the development of numerous facilities in the area.

Issue	Issue	Extent
Loss of arable land due	Loss of arable land due to presence of infrastructure. However, at the end of the project life, it is anticipated that removal of the structures would enable the land to be returned to more or less a natural state, with little impact, especially given the low prevailing agricultural potential.	Local

Gaps in knowledge & recommendations for further study

Due mainly to the low agricultural potential of the soils and the prevailing climatic limitations for agriculture, it is extremely unlikely that a detailed soil investigation including sampling will be necessary during the EIA Phase.

Impacts on Soils, Erosion Potential and Geomorphology

The most important issues are the direct impacts of degradation and specifically accelerated erosion of soil from the area of activity. Wind erosion in disturbed areas where soil is loosened will probably be the more common form of erosion due to the low precipitation in this region. This would affect the ecosystems operating in the soil and the plant and animal species that depend on it for growth and survival.

Issue	Nature of Impact	Extent of Impact
Soil erosion	Accelerated loss of sediment cover through rainfall or artificially concentrated run-off may occur.	Local
<p>Gaps in knowledge & recommendations for further study</p> <p>The following activities will be undertaken as part of the soils and erosion potential specialist study during the EIA Phase:</p> <ul style="list-style-type: none"> » Conduct a site visit to confirm the physical and geological information collated during the Scoping Phase and to collect visual information pertaining to the soil types and their geotechnical engineering properties. » Assess the present state of erosion, identify critical areas in terms of erosion and produce a map identifying these areas. » Prepare a specialist report detailing the environmental issues and potential impacts pertaining to soil degradation and erosion. » Assess the potential impacts using a weighting system that assigns a value to the categories (extent, duration, magnitude, probability) and arrives at a total which depicts the significance of the particular impact. » Provide mitigating measures to input into the EMP. 		

Impacts on heritage resources		
<p>Indirect impacts during the operation phase would include the proximity of operations in a given area could result in secondary indirect impacts resulting from the movement of people or vehicles in the immediate or surrounding vicinity. Disturbance and/or destruction of unique and non-renewable heritage resources. In the event of archaeological materials being present such activities would alter or destroy their context (even if the artefacts themselves are not destroyed). Without context, archaeological traces are of much reduced significance. It is the contexts as much as the individual items that are protected by the heritage legislation.</p> <p><u>There is the potential for cumulative impacts with the development of numerous facilities in the area.</u></p>		
Issue	Nature of Impact	Extent of Impact
Indirect impacts	Indirect impacts during the operation phase would include the proximity of operations in a given area could result in secondary indirect impacts resulting from the movement of people or vehicles in	Local

	the immediate or surrounding vicinity.	
<p>Gaps in knowledge & recommendations for further study</p> <p>The following activities will be undertaken as part of the heritage specialist study during the EIA Phase:</p> <ul style="list-style-type: none"> » Conduct a site visit whereby anticipated locations for both area and linear infrastructure should be examined on foot. » Any identified heritage sites would be assessed (i.e. in terms of the classification of the landforms and visible archaeological traces, site attributes and value assessment) relative to the known heritage of the region, providing a quantifiable measure for defining significance as a basis for recommendations to be made. » Nineteenth- and twentieth-century cultural history and intangible heritage values attached to places would need to be assessed during EIA fieldwork. » With regard to fossils, a preliminary assessment of the likelihood of their occurring here should be obtained from a palaeontologist. » Prepare a specialist report detailing the environmental issues and potential ecological impacts. » Assess the potential impacts using a weighting system that assigns a value to the categories (extent, duration, magnitude, probability) and arrives at a total which depicts the significance of the particular impact. 		

<p>Visual Impacts</p> <p>Operation related activities which could affect the overall visual aesthetics of the study site include the presence of access roads, the substation, and the associated power line. The relatively undersized structure dimensions (with respect to height) associated with the proposed PV technology compared to solar thermal technologies or wind energy technologies is expected to be much less visually intrusive.</p> <p><u>There is the potential for cumulative impacts with the development of numerous facilities in the area.</u></p>		
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Issue	Nature of Impact	Extent of Impact
Visual impacts – PV panels	<p>Potential impacts associated on local sensitive receptors which include:</p> <ul style="list-style-type: none"> » <u>Observers travelling along the main or major secondary roads (i.e. R380 & the N14) in close proximity of the proposed facility.</u> » <u>Residents of Dibeng and individual/isolated landowners/homesteads located within areas of potential visual exposure.</u> 	Local

Visual impacts – ancillary infrastructure	The potential visual impact of the presence of ancillary infrastructure (i.e. the substation; associated power line and internal access roads) on observers residing in close proximity of the facility.	Local
<p>Gaps in knowledge & recommendations for further study:</p> <p>The following activities will be undertaken as part of the visual specialist study during the EIA Phase:</p> <ul style="list-style-type: none"> » Spatial analyses (with respect to visual distance/observer proximity, viewer incidence/viewer perception) should be undertaken in order to create a visual impact index that will further aid in determining potential areas of visual impact. This exercise should be undertaken for the core facility as well as for ancillary infrastructure, as these structures (e.g. the power line and substation) are envisaged to have varying levels of visual impact at a localised scale. Site-specific issues (which are mentioned above), and potential sensitive visual receptors should be measured against this visual impact index and be addressed individually in terms of nature, extent, duration, probability, severity and significance of visual impact. 		

<p>Impacts on the social environment</p> <p>The predominant social challenges experienced in this region include:</p> <ul style="list-style-type: none"> » Training opportunities and job creation as the reduction of poverty therefore remains the most critical challenge faced. » A definite need for social activities, services, and youth development. » Education. » Provision of basic social services including sanitation. <p><u>There is the potential for cumulative impacts with the development of numerous facilities in the area.</u></p>		
Issue	Nature of Impact	Extent of Impact
Employment opportunities	A project of this nature is expected to create some direct job opportunities for locals. Additional secondary employment opportunities for locals could materialise such as security and maintenance services. Based on the high unemployment rate in Ward 1 it is anticipated that the benefits that could accrue to the residents of Dibeng would have major positive impacts on some individuals' socio-economic well-being. The	Local - Regional

		<p>positive impact associated with the creation of employment (even limited) in an area where job opportunities are scarce and where the unemployment rates are high and possibly growing, as well as the possible economic spin-offs are rated as of a moderate significance. The development would thus not reduce the unemployment rate of the area, but it would still serve as a “lifesaver” for some households in the area.</p> <p>Some local procurement of goods, materials and services could occur which would result in positive economic spin-offs. Further economic spin-offs and socio-economic benefits could accrue to the local communities should the project proponent become involved in social development projects.</p>	
Transportation of workers	of	<p>Transportation of workers would be fairly easy if residents of Dibeng could be employed and no negative impacts are thus foreseen in this regard. Due to the short distance that would need to be travelled, it is expected that the project would have the minimum negative impact on the workers’ daily living and movement patterns. Once operational, the impact on the daily living and movement patterns of neighbouring residents is expected to be minimal and intermittent (e.g. the increase in traffic to and from site).</p>	Local
Skills development		<p>Through training and skills development, the proposed project would provide employees from the local community with transferable skills and could thus result in the overall improvement of the quality of life of those involved.</p>	Local
Social services & environmental awareness		<p>The proposed project is expected to put some additional pressure on the local emergency and fire fighting services. This impact, however, could easily respond to the implementation of mitigation measures. The proposed project could assist to create some environmental awareness among the youth and learners of the Dibeng area.</p>	Local

Tourism industry	The proposed facility could contribute to the local tourism industry with subsequent positive economic impacts on the local communities. The benefits associated with this aspect could be enhanced through proactive planning by the community, the project proponent and the Gamagara Local Municipality.	Local – Regional
Contribution of clean energy	On a global scale the project is anticipated to have positive social and health related impacts through the “greener” technology that will be used (no noise / no emissions and so forth).	National
<p>Gaps in knowledge & recommendations for further study</p> <p>The following activities will be undertaken as part of the social specialist study during the EIA Phase:</p> <ul style="list-style-type: none"> » A comprehensive literature review and analysis would be undertaken in order to acquire further demographic and socio-economic information concerning the receiving environment and to build on the initial profiling of the local population’s socio-economic characteristics. » A site visit would be undertaken in order to gather additional primary data by means of consultation with the stakeholders and affected parties. » The social impact assessment team will study and analyse the information gathered by the biophysical studies (e.g. information related to technical, environmental, economic and demographic aspects and land-use changes, impact on other facilities, services, and so forth) done in parallel with the public participation process and social studies. This would assist the social team to assess the impact of the proposed development on the direct (surrounding communities) and indirect (regional) environment. » The following variables would also be assessed: <ul style="list-style-type: none"> o Population impacts; o Community/institutional arrangements; o Conflicts between local residents and newcomers; o Individual and Family level impacts; o Community infrastructure needs; and o Intrusion impacts. » Assess these potential impacts using a weighting system that assigns a value to the categories (extent, duration, magnitude, probability) and arrive at a total which depicts the significance of the particular impact. 		

Table 5.3: Scoping Matrix for the Proposed San Solar Energy Facility

PROJECT PHASES & ACTIVITIES	Homesteads/Residences	Recreational Users	Traffic / Roads	Visual Receptors	Geology	Geomorphology	Agricultural Potential	Plant Species	Animal Species	Heritage	Social
<i>Site surveys</i>			X		X	X	X	X	X	X	
<i>Site preparation</i>	X		X	X	X	X	X	X	X	X	X
<i>Transportation of equipment to site</i>	X	X	X	X							X
<i>Establishment of construction camps</i>							X	X	X	X	
<i>Establishment of concrete foundations</i>	X	X			X	X	X	X	X	X	
<i>Construction of the substation</i>					X		X	X	X	X	
<i>Erection of the PV panels</i>					X		X	X	X		
<i>Erection of the substation</i>					X		X	X	X		
<i>Establishment of ancillary infrastructure (i.e. power line & access roads)</i>	X	X	X	X	X	X	X	X	X	X	
<i>Connection of the substation</i>									X		
<i>Undertake site rehabilitation</i>					X	X	X	X		X	
<i>Management & Activities of Construction Crew</i>			X		X			X	X		X
<i>PV panels</i>	X	X		X					X		X
<i>Substation</i>				X							
<i>Power line</i>	X	X		X	X				X		
<i>Internal access roads</i>				X		X					
<i>External access roads</i>		X	X								X
<i>Site Maintenance</i>	X							X	X		X
<i>Management & Activities of Operational Crew</i>	X	X	X					X	X		X

CONCLUSIONS

CHAPTER 6

San Solar Energy Facility (Pty) Ltd proposes to establish a solar energy facility with a generating capacity of 75 MW (91 MW installed capacity) located approximately 16 km northwest of Kathu in the Northern Cape (refer to Figure 1.1). The facility will entail the installation of PV solar panels and associated infrastructure which would comprise of the following aspects:

- » An array of solar panels with a generation capacity of up to 75 MW (91 MW installed capacity)
- » An on-site generator transformer and a single substation to facilitate the connection between the solar energy facility and the Eskom electricity grid.
- » An overhead power line.
- » Internal access roads.
- » Gate house and security.
- » Warehouse.
- » Canteen and change rooms.
- » Office and Control centre.

This Final Scoping Report aimed to:

- » Identify the broad issues detailing the nature and extent of the proposed facility.
- » Identify the potential issues associated with the proposed project.
- » Define the specific studies required within the EIA.

The afore-mentioned aims were achieved through an evaluation of the proposed project involving the project proponent, and a consultation process with key stakeholders that included both relevant government authorities and I&APs. In accordance with the requirements of the EIA Regulations, feasible project-specific alternatives (including the 'do nothing' option) have been identified for consideration within the EIA process.

The conclusions and recommendations of this Draft Scoping Report are the result of desk-top evaluations of impacts identified by the EAP, and the parallel process of public participation. Representatives of several stakeholder groupings in the study area and the Northern Cape during the public consultation process have been consulted as can be seen in the I&AP database.

A summary of the conclusions of the evaluation of the proposed facility is provided below. Recommendations regarding investigations required to be

undertaken within the EIA are provided within the Plan of Study for EIA (refer to Chapter 7).

6.1. Conclusions drawn from the evaluation of the Proposed Site for Development of a Solar Energy Facility

The site that has been identified for the proposed facility covers an area of approximately 8 km² which is larger than the proposed development footprint of the solar energy facility. Therefore, the facility and the associated infrastructure (i.e. substation and internal access roads) can be appropriately placed within the larger site taking into account identified environmental constraints. This scoping study has identified areas of higher sensitivity on the larger site to assist in focusing the location of the development footprint to minimise the potential for environmental impact.

Issues identified through this scoping study as being potentially associated with the proposed facility include impacts on ecology, flora and fauna; agricultural potential; erosion potential; heritage sites and fossils; visual quality and aesthetics and the social environment. The majority of potential impacts identified to be associated with the construction and operation of the proposed facility are anticipated to be localised and restricted to the proposed site. No environmental fatal flaws were identified to be associated with the site, and no absolute 'no-go' areas were identified for the larger site, although areas of high ecological sensitivity were identified in terms of the small saline pans which should be largely avoided or impacts on such sites should be minimised to reduce impacts to acceptable levels.

The potentially significant issues related to the **construction** of the proposed facility include:

- » Impacts on flora, fauna, and ecology resulting from activities such as site clearance and levelling for installation of the facility components and associated infrastructure. This is attributed to parts of the study area having high ecological sensitivity (i.e. pans), including potentially sensitive plant and animal species of conservation concern that may be present on the site. Soil erosion, loss or degradation through site clearance and levelling for installation of the facility components and associated infrastructure (including the internal access roads and the power line).
- » Impact on heritage sites through construction activities.
- » Visual impacts on the landscape related to the construction site and the construction of internal access roads and the power line.

- » Socio-economic impacts, both positive (job creation and skills development) and negative (impacts associated with construction workers in the area and an influx of job seekers into the area).
- » The potential for cumulative impacts on the environment (positive and negative) associated with the construction of numerous facilities in the area. These potential impacts relate to loss of vegetation, impacts on agricultural potential/soils and impacts on the social environment (in terms of job creation, skills development, etc.).

The potentially significant issues related to the **operation** of the proposed facility include:

- » Impacts on flora, fauna and ecology – including impacts on threatened bird species (i.e. through interactions with the power line), impacts on run-off and drainage patterns (i.e. this may occur where the infiltration rates of the landscape has been changed due to the presence of an impermeable surface such as the access roads).
- » Soil erosion and loss - Wind erosion in disturbed areas where soil is loosened will probably be the more common form of erosion due to the low precipitation in this region. This would affect the ecosystems operating in the soil and the plant and animal species that depend on it for growth and survival. Furthermore, accelerated loss of sediment cover through or artificially concentrated run-off may occur (i.e. through the presence of impermeable surfaces such as the roads).
- » Visual impacts and impacts on 'sense of place' where the facility and/or associated infrastructure is viewed as visually obtrusive by potentially sensitive receptors.
- » Positive socio-economic impacts through job creation, skills development and through the development of clean, renewable energy projects.
- » The potential for cumulative impacts on the environment (positive and negative) associated with the presence of numerous facilities in the area. These potential impacts relate mainly to visual impacts and impacts on the social environment (in terms of job creation, local economic upliftment, etc.).

6.2. Conclusions drawn from the Evaluation of the Potential Issues associated with the proposed Power line

Energy generated by the San Solar Energy Facility will be evacuated to the national grid via a new substation (which will be constructed on the site). The substation is proposed to be connected via a loop-in loop-out connection to the Ferrum-Umtu 132kV power line which is currently under construction by Eskom. This power line lies ~5km east of the proposed site.

Potential issues identified to be associated with the proposed power line include impacts on flora, fauna, and ecological processes (through potential habitat destruction and disturbance), impacts on avifauna (i.e. because of interactions such as collisions and electrocutions), impacts on heritage sites (during excavation activities) and visual impacts (predominately during the operation phase). The alignment of the power line adjacent/parallel to existing linear infrastructure may partially mitigate the potential for negative impacts. The potential for cumulative impacts on the environment associated with the presence of numerous power lines in the area has been identified.

6.3. Sensitivity Analysis for the Study Site

The **potentially sensitive areas** which have been identified through the environmental scoping study are listed below. In order to reduce the potential for on-site environmental impacts, these areas should be avoided as far as reasonably possible. This 'funnel-down approach' in the consideration of the larger site focuses the detailed specialist studies in the EIA Phase to the portion of the site with reduced environmental sensitivities. These potentially sensitive areas already identified through the scoping study include:

- » *Small saline pans:* Construction activities may lead to some direct or indirect loss of or damage to some of these areas or changes to the catchment of these areas. This may lead to loss of habitat for species that depend on this habitat type. Pans may possibly be important habitat for a number of species in the study area, including those with a restricted distribution. They also provide a habitat for plants, insects, batrachians and birds. These areas must be protected. Wet zones have been identified to the north west of the site through desktop investigation. These areas will have to be confirmed and delineated in the Impact Assessment phase of this EIA. A 50m buffer from these zones must be established.

- » *Potential occurrence of populations of Red List organisms and Protected Tree Species:* This includes flora (including protected tree species) and fauna (including avifauna) that have been evaluated as having a chance of occurring within the study area. It has been evaluated that there are five mammal species, four bird species and one reptile species of conservation concern that could occur in available habitats in the proposed study area. This includes three species classified as Vulnerable, the Kori Bustard, African White-backed Vulture and Martial Eagle and three species classified as Near Threatened, the Honey Badger, Schreiber's Long-fingered Bat, and the Southern African Hedgehog. However, none of these has been assessed as having a high probability of occurring on site. Tree species protected under the National

Forest Act that have a geographical distribution that includes the study area are Camel Thorn, Grey Camel Thorn, and Shepard's Tree.

With an understanding of which area/s of the site would be least impacted by the development of such a facility, San Solar Energy Facility (Pty) Ltd have now prepared a preliminary layout for consideration within the EIA Phase. The preliminary layout indicating the location of the proposed activity on the site as well as identified sensitive areas in included as Figure 6.1.

The location and position of infrastructure, as well as any alternative infrastructure layouts to avoid potentially sensitive areas will be considered within the EIA Phase. During this phase more detailed studies will be conducted, and sensitive areas will be confirmed. Should there be additional sensitive areas, they will be identified and demarcated with more detail and accuracy than in this Scoping Report.

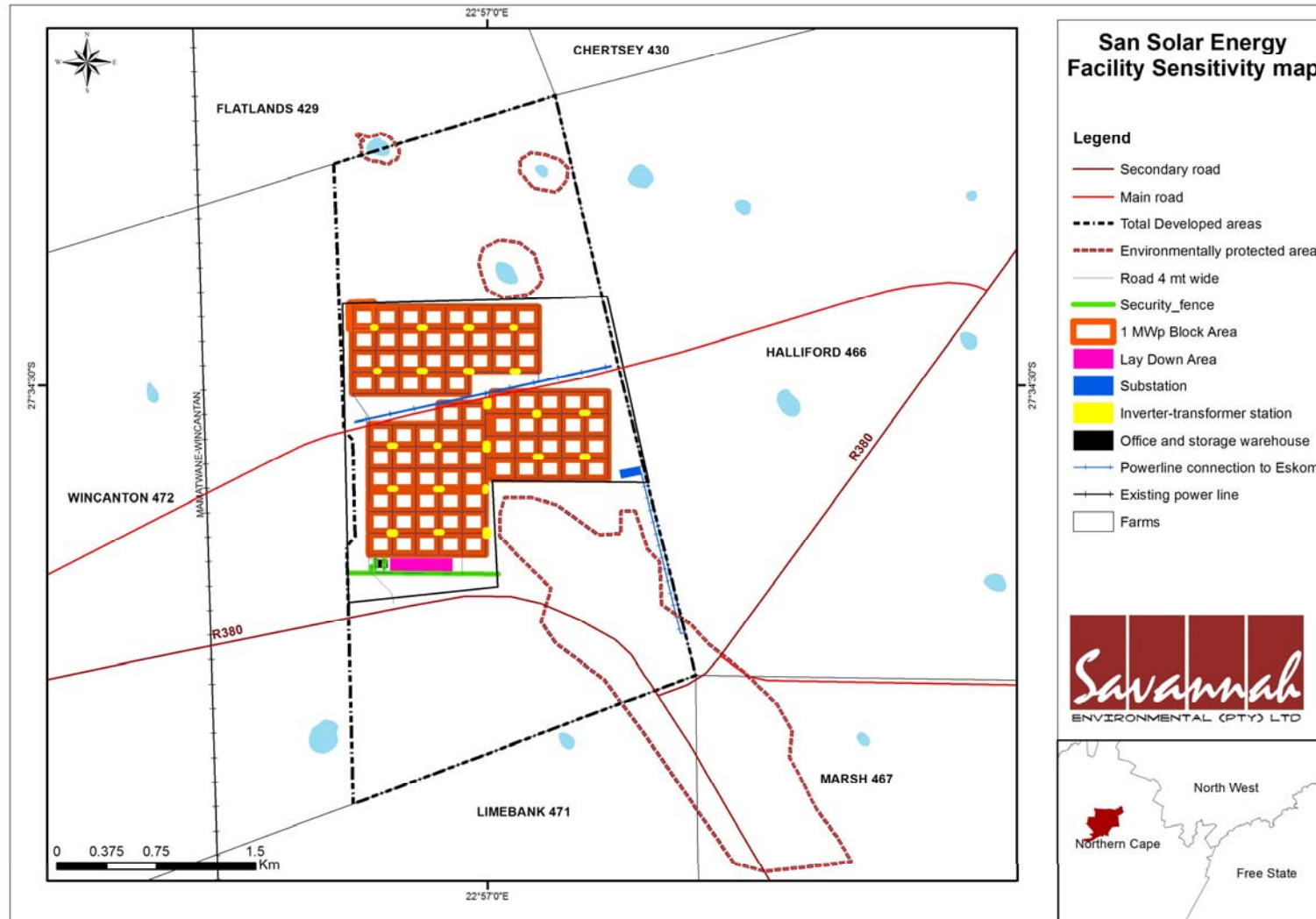


Figure 6.1: Preliminary layout of the San Solar Facility indicating the location of the proposed activity on the site as well as identified sensitive areas

PLAN OF STUDY FOR THE EIA PHASE

CHAPTER 7

This Draft Scoping Report includes a detailed description of the nature and extent of the proposed San Solar Energy Facility with details regarding the Scoping Phase, as well as the issues identified and evaluated to date. This chapter provides the context for a Plan of Study for the EIA. This plan describes how the EIA Phase will proceed and includes detailed specialist studies for those potential impacts recorded to be of significance. The key findings of the Scoping Phase includes inputs from authorities, the public, the proponent and the EIA team and are used to inform the Plan of Study for EIA together with the requirements of the NEMA EIA Regulations and applicable guidelines.

7.1. Aims of the EIA Phase

The EIA Phase will aim to achieve the following:

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

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

7.2. Authority Consultation

Consultation with the regulating authorities (i.e. DEA and DENC) has been undertaken and will continue throughout the EIA process. On-going consultation and input from DEA and DENC will include the following:

- » Submission of a Final Scoping Report following a 30-day public review period of this draft scoping report (and consideration of comments received).

- » Submission of a Final EIA Report following a 30-day public review period of the draft EIA Report.
- » A consultation meeting with DEA and DENC in order to discuss the findings and conclusions of the EIA Report.

7.3. Consideration of Alternatives

The following project alternatives will be investigated in the EIA Phase:

- » **The 'do nothing' alternative:** San Solar Energy Facility does not establish the proposed San Solar Energy Facility.
- » **Layout/design alternatives:** in terms of the design of the facility, particularly the layout of the PV and corridors/servitudes for associated infrastructure such as the access roads and power line.

7.4. Assessment of Potential Impacts and Recommendations regarding Mitigation Measures

A summary of the issues which require further investigation within the EIA phase, as well as the proposed activities to be undertaken in order to assess the significance of these potential impacts is provided within Table 7.1. The specialists involved in the EIA Phase are also reflected in Table 7.1. These specialist studies will consider the site proposed for the development of the solar energy facility and all associated infrastructure. Direct, indirect and cumulative impacts will be assessed as required in terms of the EIA Regulations.

Table 7.1: Issues requiring further investigation during the EIA Phase and activities to be undertaken in order to assess the significance of these potential impacts

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
Ecology studies	<p>The following assessments will be done during the EIA phase in order to properly assess potential impacts on the ecological receiving environment by the proposed facility:</p> <ul style="list-style-type: none"> » The presence and distribution of pans and drainage lines on site will be confirmed. This will be done primarily using aerial photograph interpretation, but will be confirmed in the field using topographic and floristic indicators. » Searches will be undertaken in the thicket in the drainage lines to determine whether any protected trees occur on site or not. » The presence of species of concern will be evaluated during the EIA phase. This will be done by assessing habitat suitability for those species that have been identified as potentially occurring in the area. 	Marianne Strohbach of Savannah Environmental
Heritage studies	<p>Areas where infrastructure is proposed will be surveyed and recorded in detail. All sites will be evaluated in terms of:</p> <ul style="list-style-type: none"> » Type of site - e.g. shell midden, shell scatter, stone feature etc. » Location and environmental surrounds - e.g. dune, grassland, etc. » Site category - e.g. Later Stone Age, Middle Stone Age etc. » Context and condition - e.g. disturbed, primary or secondary, etc. » Estimated size and depth of deposits » Cultural affinities - e.g. hunter-gatherer, pastoralist, etc. » Record site content - e.g. food waste, cultural material, etc. » Record basic information of finds -e.g. types of bone, shellfish species, raw material used for stone tools, type of stone tools, ceramics, describe stone features etc. » Estimate relative age of sites from cultural material and other information. » Record and describe any graves or burial sites. » Make statement on the importance/significance of site, feature etc. » Rate sites - e.g. national, provincial, local etc. <p>A report will be compiled with recommendations for mitigation. It will include an</p>	McGregor Museum

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	assessment of the potential impact of development on the sites and proposals for mitigation and/or protection - towards a Phase 2 and possible Phase 3 investigation.	
<u>Palaeontology Assessment</u>	<p><u>The assessment will include:</u></p> <ul style="list-style-type: none"> » <u>The assessment of the probability of palaeontological materials (fossils) being uncovered in the subsurface and being disturbed or destroyed in the process of making excavations (bulk earth works). The main purposes are to:</u> <ul style="list-style-type: none"> * <u>Outline the nature of possible palaeontological heritage resources in the subsurface of the affected area.</u> * <u>Suggest the mitigatory actions to be taken with respect to the occurrence of fossils during the construction phase.</u> 	<u>Jennifer Botha-Brink of Karoo Palaeontology National Museum</u>
Soils and agricultural potential	<p>A detailed site visit will have to be conducted as part of the EIA level investigation and the following parameters should be investigated:</p> <ul style="list-style-type: none"> » Soil distribution (classification) on the site; » Current status of irrigation infrastructure, soils and production potential for the irrigation areas; » Extent of degradation due to current land use; » Erosion status and erodibility of the soils on the site; and » Mitigation measures to arrest current impacts and manage future impacts associated with the development. 	Iain Paton of Outeniqua Geotechnical Services
Social studies	<p>The approach will include:</p> <ul style="list-style-type: none"> » Review of existing project information, including the Planning and Scoping Documents; » Collection and review of reports and baseline socio-economic data on the area (IDPs, Spatial Development Frameworks etc.); » Site visit and interviews with key stakeholders in the area including local land owners and authorities, local community leaders and councillors, local resident associations and residents, local businesses, community workers etc; » Identification and assessment of the key social issues and opportunities; » Preparation of a Social Impact Assessment report, including identification of mitigation/optimization and management measures to be implemented. 	Tony Barbour

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	<p>Based on review of information relating to solar energy facilities and experience with SIAs undertaken for other similar facilities, the most important issues that are likely to be raised and will need to be assessed during the EIA include:</p> <ul style="list-style-type: none"> » Impact on land use; » Influx of job seekers into the area during the construction phase. » Creation of employment and business opportunities during the construction phase; » Creation of employment and business creation opportunities during the operational phase; » Creation of potential training and skills development opportunities for local communities and businesses; » Potential up and down-stream economic opportunities for the local, regional and national economy; and » Provision of clean, renewable energy source for the national grid. <p>In terms of potential impacts on local farmers in the area the following issues will need to be assessed:</p> <ul style="list-style-type: none"> » Potential threat to farm safety due to increased number of people in the area and construction workers; » Potential damage to water and other farm infrastructure (during the construction and operational phase); <p>Potential impact on farming operations and loss of productive land (during the construction and operational phase), and overall impact on sustainability of farming practices as a result of the proposed development.</p>	

7.5. Methodology for the Assessment of Potential Impacts

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

- » The **nature**, which shall include a description of what causes the effect, what will be affected, and how it will be affected.
- » The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional:
 - * Local extending only as far as the development site area – assigned a score of 1;
 - * Limited to the site and its immediate surroundings (up to 10 km) – assigned a score of 2;
 - * Will have an impact on the region – assigned a score of 3;
 - * Will have an impact on a national scale – assigned a score of 4; or
 - * Will have an impact across international borders – assigned a score of 5.
- » The **duration**, wherein it will be indicated whether:
 - * The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
 - * The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
 - * Medium-term (5–15 years) – assigned a score of 3;
 - * Long term (> 15 years) - assigned a score of 4; or
 - * Permanent - assigned a score of 5.
- » The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
 - * 0 is small and will have no effect on the environment;
 - * 2 is minor and will not result in an impact on processes;
 - * 4 is low and will cause a slight impact on processes;
 - * 6 is moderate and will result in processes continuing but in a modified way;
 - * 8 is high (processes are altered to the extent that they temporarily cease); and
 - * 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- » The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale, and a score assigned:
 - * Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
 - * Assigned a score of 2 is improbable (some possibility, but low likelihood);
 - * Assigned a score of 3 is probable (distinct possibility);
 - * Assigned a score of 4 is highly probable (most likely); and

- * Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- » The **significance**, which shall be determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
- » The **status**, which will be described as *either positive, negative or neutral*.
- » The degree to which the impact can be *reversed*.
- » The degree to which the impact may cause *irreplaceable loss of resources*.
- » The degree to which the impact can be *mitigated*.

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

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

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

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

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

As San Solar Energy Facility (Pty) Ltd has the responsibility to avoid and/or minimise impacts as well as plan for their management (in terms of the EIA Regulations), the mitigation of significant impacts will be discussed. Assessment of mitigated impacts will demonstrate the effectiveness of the proposed mitigation measures.

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

- » **Detailed description** of the proposed activity
- » A description of the property(ies) on which the activity is to be undertaken and the location of the activity on the property(ies)

- » A description of the **environment that may be affected by the activity** and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity
- » Details of the **public participation process** conducted, including:
 - * Steps undertaken in accordance with the plan of study for EIA;
 - * A list of persons, organisations and Organs of State that were registered as interested and affected parties;
 - * A summary of comments received from, and a summary of issues raised by registered interested and affected parties, the date of receipt of these comments and the response to those comments; and
 - * Copies of any representations, objections and comments received from registered interested and affected parties
- » A description of the **need and desirability** of the proposed project and identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity
- » An indication of the methodology used in determining the **significance** of potential environmental impacts
- » A description and comparative **assessment of all alternatives** identified during the environmental impact assessment process
- » A summary of the findings and recommendations of **specialist reports**
- » A description of all environmental issues that were identified during the environmental impact assessment process, an assessment of the significance of each issue and an indication of the extent to which the issue could be addressed by the adoption of mitigation measures
- » An assessment of each identified potentially significant impact
- » A description of any assumptions, uncertainties and gaps in knowledge
- » an environmental **impact statement** which contains:
 - * A summary of the key findings of the environmental impact assessment; and
 - * A comparative assessment of the positive and negative implications of the proposed activity and identified alternatives
- » A draft **environmental management plan**
- » Copies of specialist reports

The Draft EIA Report will be released for a 30-day public review period. The comments received from I&APs will be captured within a Comments and Response Report, which will be included within the Final EIA Report, for submission to the authorities for decision-making.

7.6. Public Participation Process

A public participation process will be undertaken by **Sustainable Futures ZA** in conjunction with Savannah Environmental. Consultation with key stakeholders and I&APs will be on-going throughout the EIA Phase. Through this consultation process, stakeholders and I&APs will be encouraged to identify additional issues of concern or highlight positive aspects of the project, and to comment on the findings of the EIA Phase. In order to accommodate the varying needs of stakeholders and I&APs within the study area, as well as capture their inputs regarding the project, various opportunities will be provided for stakeholders and I&APs to be involved in the EIA Phase of the process, as follows:

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

The Draft EIA Report will be made available for public review for a 30-day period prior to finalisation and submission to the DEA for review and decision-making. In order to provide an overview of the findings of the EIA process and facilitate comments, a public meeting and key stakeholder workshop will be held during this public review period.

7.7. Key Milestones of the Programme for the EIA

The envisaged key milestones of the programme for the EIA Phase are outlined in the following table.

Key Milestone Activities	Proposed timeframe
Public review period for Draft Scoping Report	16 March to 17 April 2012
Finalisation of Scoping Report & submission to DEA	April 2012
Submission of Amended Final Scoping Report to DEA	July 2012
Undertake specialist studies and public participation process	May to August 2012
Make Draft EIA Report and Draft EMP available to the public, stakeholders and authorities	August 2012
Finalisation of EIA Report for submission to DEA for review and decision-making	September 2012