ENVIRONMENTAL IMPACT ASSESSMENT PROCESS
DRAFT SCOPING REPORT

PROPOSED PRIESKA SOLAR ENERGY FACILITY & ASSOCIATED INFRASTRUCTURE, NORTHERN CAPE

DEA Ref. No: 14/12/16/3/3/2/313

DRAFT SCOPING REPORT FOR PUBLIC REVIEW

3 September 2012 – 3 October 2012

Prepared for:

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PROJECT DETAILS

DEA Reference No.	:	14/12/16/3/3/2/313
Title	:	Environmental Impact Assessment Process Draft Scoping Report: Proposed Prieska Solar Energy Facility & Associated Infrastructure, Northern Cape
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Client	:	Jouren Solar (Pty) Ltd
Report Status	:	Draft Scoping Report for Public Review
Review Period	:	3 September 2012 – 3 October 2012

When used as a reference this report should be cited as: Savannah Environmental (2012) Draft Scoping Report: Proposed Prieska Solar Energy Facility & Associated Infrastructure, Northern Cape.

PURPOSE OF THE SCOPING REPORT

Jouren Solar (Pty) Ltd is proposing the establishment of a commercial solar electricity generating facility and associated infrastructure on Portion 3 of the Farm Holsloot 47 in the Siyathemba Local Municipality in the Northern Cape (refer to Figure 1.1). The solar energy facility is proposed to accommodate several arrays of tracking or static **photovoltaic (PV) panels** and associated infrastructure on a portion of the proposed site.

Jouren Solar (Pty) Ltd has appointed Savannah Environmental as the independent environmental consultant to undertake the Environmental Impact Assessment (EIA) for the proposed facility. The EIA process is being undertaken in accordance with the requirements of the EIA Regulations of June 2010 (of GNR543) promulgated in terms of the National Environmental Management Act (NEMA; Act No. 107 of 1998).

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

» **Chapter 1** provides background to the proposed solar energy facility and the environmental impact assessment process.
» **Chapter 2** describes the components of the proposed project.
» **Chapter 3** outlines the process which was followed during the Scoping Phase of the EIA process.
» **Chapter 4** describes the existing biophysical and socio-economic environment affected by the proposed project.
» **Chapter 5** provides a desktop assessment of the potential environmental and social impacts associated with the two development phases of the proposed project.
» **Chapter 6** presents the conclusions of the scoping evaluation.
» **Chapter 7** describes the Plan of Study for EIA.
» **Chapter 8** provides references used in the compilation of this Scoping Report.

INVITATION TO COMMENT ON THE DRAFT SCOPING REPORT

This **Draft Scoping Report** has been made available for public review at the following places, which lie in the vicinity of the proposed project area from **3 September 2012 – 3 October 2012 at:**

» Prieska Public Library

The report is also available for download on:

» www.savannahsa.com

Please submit your comments to
Gabriele of **Savannah Environmental** PO Box 148, Sunninghill, 2157 Tel: 011 234 6621 Fax: 086 684 0547 Email: gabriele@savannahsa.com
The due date for comments on the Draft Scoping Report is **3 October 2012**

Comments can be made as written submission via fax, post or e-mail.

EXECUTIVE SUMMARY

Background

Jouren Solar (Pty) Ltd is proposing the establishment of commercial solar electricity generating facility and associated infrastructure on Portion 3 of the Farm Holsloot 47 in the Siyathemba Local Municipality in the Northern Cape. The project is referred to as the **Prieska Solar Energy Facility.**

Based on a pre-feasibility analysis and site identification process undertaken by Jouren Solar (Pty) Ltd, a favourable area has been identified for consideration and evaluation through an environmental impact assessment process.

The Prieska solar energy facility is proposed to accommodate several arrays of tracking or static **photovoltaic (PV) panels** and associated infrastructure on a portion of the proposed site. From a regional perspective, this area is considered favourable for the development of commercial solar electricity generating facilities by virtue of the **climatic conditions** (primarily as the economic viability of a solar energy facility is directly dependent on the annual direct solar irradiation values for a particular area), orographic conditions, relief and aspect, the extent of the site, and the availability of a direct **grid connection** (i.e. the point of connection to the National grid).

An EIA process and public participation process is being undertaken for the proposed project. 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 Draft Scoping Report.

Project Location

The Prieska Solar Energy facility is proposed to be established on Portion 3 of the Farm Holsloot 47, which lies approximately 30km north-east of Prieska within the Siyathemba Local Municipality of the Northern Cape.

Project Components

The facility is proposed to accommodate several arrays of Photovoltaic (PV) solar panels with a generating capacity of 75 MW and includes the following associated infrastructure:

» Solar panels.
» An on-site inverter to step up the power and a substation to facilitate the connection between the solar energy facility and the Eskom electricity grid.
» Two alternatives are being considered to evacuate the electricity from the facility.
  a) Alternative 1 a loop-in and loop out power line to connect

into the existing Burchell-Mooidraai 1 132kV power line which traverses the site;

b) Alternative 2 to connect directly into the existing Eskom Mooidraai Substation located on the site.

» Internal access roads.
» Workshop area for maintenance and storage.

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; this will serve to inform the design of the facility.

Evaluation of the Proposed Project

The main issues identified through this scoping study associated with the proposed solar energy facility are summarised in Table 1 below.

The extent of the broader site (3100 hectares) is larger than the space required for the facility's development footprint (permanent footprint of 200 hectares plus associated infrastructure). Therefore, the facility can be appropriately placed within the boundary of the larger site taking any identified environmental and other constraints into account.

As can be seen from the table above, the majority of potential impacts identified to be associated with the construction of the Prieska Solar Energy Facility are anticipated to be localised and restricted to the proposed site itself (apart from social impacts – job creation which could have more of a regional positive impact; and visual impacts which would extend beyond the site boundaries), while operational phase impacts range from local to regional and national (being the positive impact of contribution of clean energy as part of the energy mix in South Africa; and visual impacts which would extend beyond the site boundaries).

Table 1: Summary of significance of the potential impacts associated with the proposed Prieska solar energy facility development

Construction / Decommissioning Impacts	**Extent**
Disturbance or loss of indigenous natural vegetation	L
Disturbance or loss of habitat for threatened / protected plants	L
Loss of protected trees	L
Impacts on watercourses and drainage areas	L
Establishment and spread of declared weeds and alien invader plants	L
Temporary disturbance to grazing land-use of the farm during construction	L
Soil loss/ erosion / degradation	L
Loss of heritage resources	L
Temporary visual intrusions / disturbances to people	L
Job creation and skills development of local people during construction (positive impact)	L-R
Economic spin-offs to local community.	L
Safety and security risks to site and surrounds	L
Temporary disruptions in the daily living and movement patterns to neighbouring landowners	L
Operational Impacts	**Extent**
Loss of protected plant and animal species due to habitat transformation on the site.	L
Loss of low agricultural potential land on the site itself	L
Soil erosion	L
Visual impacts (intrusion, negative viewer perceptions and visibility of the facility)	R
Employment opportunities	L-R
Safety and security impacts on the site and neighbouring land.	L
Contribution of clean energy	N

L **Local** R **Regional** N **National** I **International**

The potential ecological sensitivity areas (as shown in Figure 1) that have been identified for further study include:

» **Ecologically sensitive areas (terrestrial) that occur on the site:**
Protected and red-data plant and/ animal species could potentially occur on the site. However, it is unlikely that the development, once the final layout has been designed in accordance to findings of a field investigation, will compromise the survival of any of the species of conservation concern. There are also low rocky ridges that could be remotely identified. These habitats are sensitive because of their ecosystem functions – providing specialised niches for fauna and flora, creating corridors in the landscape, catching sedimentation and concentrating water runoff. A detailed ecological survey and sensitivity assessment will be undertaken during the EIA.

» **Drainage lines within the site:**
The site is in a very arid area. There are a number of dry stream beds and drainage areas. Drainage lines (water resources) represent particularly vital natural corridors as they function both as wildlife habitat, providing resources needed for survival, reproduction and movement, and as biological corridors, providing for movement between habitat patches. The drainage lines shown in the desktop sensitivity map have been mapped as linear features only. The actual extent will be identified during field work on the next phase of the assessment.

» **Potential visual receptors/ homesteads around the site:**
The study area is sparsely populated (approximately 1.4 persons per km^2), with the highest concentration of people living in towns such as Prieska. However, there are homesteads and settlements present within the study area that could experience visual impacts from the solar panels and/or disturbances during construction of the facility. These homesteads include: Rooisloot, Taaibos, Ratelpan, Annexdraai, Diepfontein, Diepfontein 2, Rooidam, Johnsonspan and Herbou, which all occur within a 16km radius of the proposed facility[1]. The town of Prieska lies 30km from the proposed site, and will not be visually exposed to the proposed facility.

The level of sensitivity on the proposed site still needs to be

[1] It is uncertain whether all of the potentially affected farmsteads are inhabited or not. It stands to reason that farmsteads that are not currently inhabited will not be visually impacted upon at present. These farmsteads do, however retain the potential to be affected visually should they ever become inhabited again in the future. For this reason, the VIA report operates under the assumption that all the homesteads are inhabited. This will be verified during the EIA phase.

determined. However, it can be assumed that within the area shown in the sensitivity map, the drainage lines could potentially be a no go area. The area of high ecological sensitivity occupies an area of ~2083 ha. The broader farm portion is 3100 ha. Should the area of high ecological sensitivity be avoided, this still leaves ~1017 ha available for the development of the facility and associated infrastructure. Note that ~200 ha will be required for the solar panels. Through the EIA phase more detailed studies will be conducted, and any sensitive areas will be marked, more accurately and in more detail than in this Draft Scoping Report.

Evaluation of the Potential Issues with Associated Infrastructure - Invertors, and Internal Access Roads

In order to connect the solar energy facility to the power grid, invertors will be used and a substation will be built on the site, to connect to the existing power line which is located on the site. The final point of connection will be dependent on the requirements of and agreements with Eskom.

Potential issues identified to be associated with the substation, internal access roads and invertors include impacts on flora, fauna and ecological processes, and potential impacts on heritage sites and visual impacts. The potential impacts with regard to associated infrastructure will be considered in detail within the EIA phase. Recommendations regarding a preferred location for this infrastructure and appropriate mitigation measures (if required) will be made. Other infrastructure such as the internal substation location/s (if required), access roads and the maintenance facility will also be considered in the EIA phase based on the preliminary layout to be provided by Jouren Solar (Pty) Ltd.

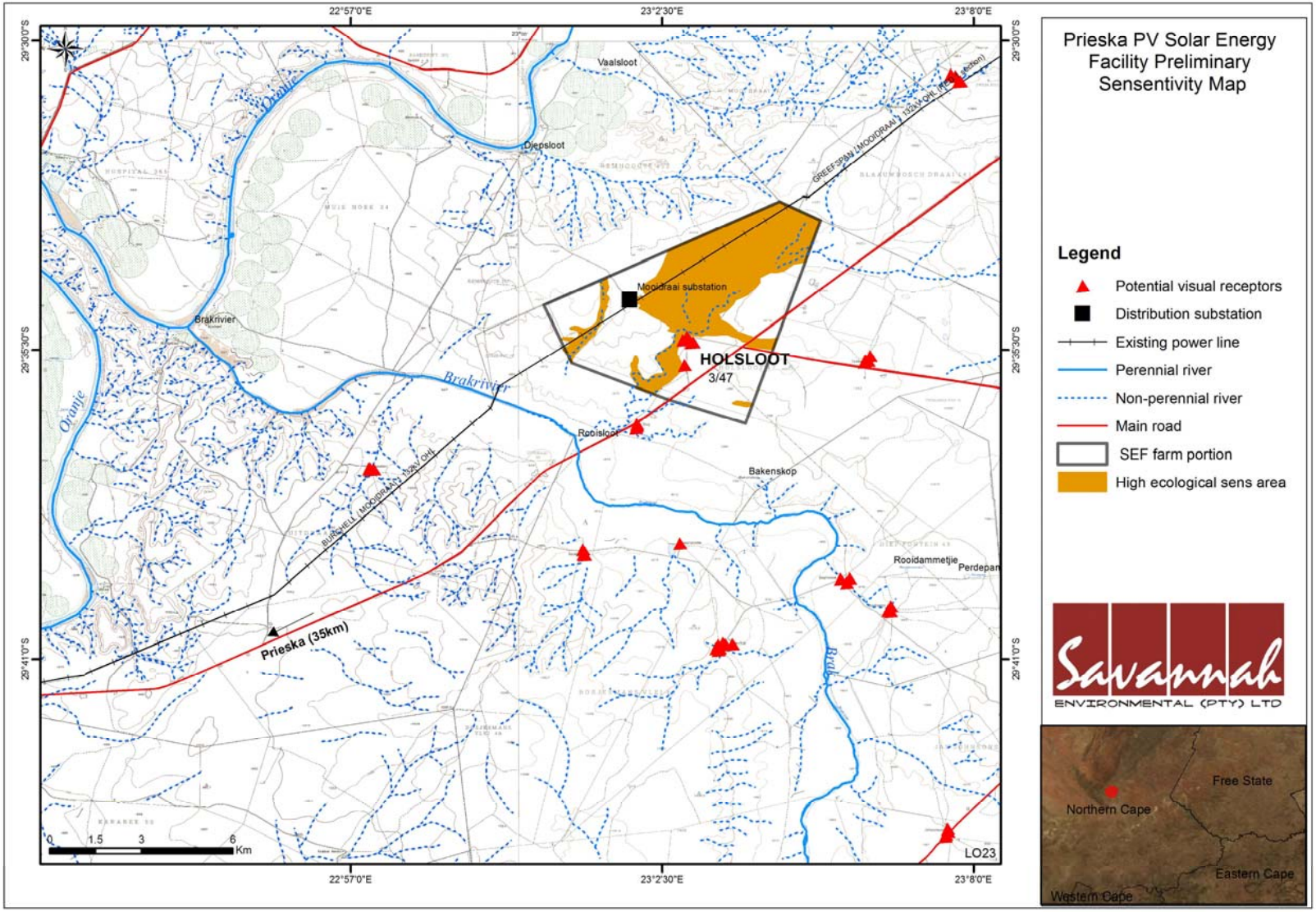

Figure 1: Preliminary environmental sensitivity map for the proposed Prieska Solar Energy Facility

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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.

Archaeological material: Remains resulting from human activities which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures.

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/)

Calcrete: A soft sandy calcium carbonate rock related to limestone which often forms in arid areas.

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.

Demand-side Management Programme (DSM): A joint initiative between the DME, the National Electricity Regulator (NER) and Eskom which aims to provide lower cost alternatives to generation system expansion by focusing on the usage of electricity. Consumers are incentivised to use electricity more efficiently and at times of the day outside of Eskom's peak periods.

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

Disturbing noise: A noise level that exceeds the ambient sound level measured continuously at the same measuring point by 7 dB or more.

'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.

Early Stone Age: A very early period of human development dating between 300 000 and 2.6 million years ago.

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

Fossil: Mineralised bones of animals, shellfish, plants and marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.

Heritage: That which is inherited and forms part of the National Estate (Historical places, objects, fossils as defined by the National Heritage Resources Act of 2000).

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.

Late Stone Age (LSA): In South Africa this time period represents fully modern people who were the ancestors of southern African KhoeKhoen and San groups (40 000 – 300 years ago).

Middle Stone Age (MSA): An early period in human history characterised by the development of early human forms into modern humans capable of abstract though process and cognition 300 000 – 40 000 years ago.

Midden: A pile of debris or dump (shellfish, stone artefacts and bone fragments) left by people after they have occupied a place.

Miocene: A geological time period (of 23 million - 5 million years ago).

National Integrated Resource Plan (NIRP): Commissioned by NERSA in response to the National Energy Policy's objective relating to affordable energy services, in order to provide a long-term, cost-effective resource plan for meeting electricity

demand, which is consistent with reliable electricity supply and environmental, social and economic policies.

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/)

Palaeontological: Any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

Pleistocene: A geological time period (of 3 million – 20 000 years ago).

Pliocene: A geological time period (of 5 million – 3 million years ago).

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).

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/).

Structure (historic): Any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith. Protected structures are those which are over 60 years old.

ABBREVIATIONS AND ACRONYMS

BID	Background Information Document
CBOs	Community Based Organisations
CDM	Clean Development Mechanism
CO_2	Carbon dioxide
DEA	National Department of Environmental Affairs
DMR	Department of Mineral Resources
DOT	Department of Transport
DWA	Department of Water Affairs
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
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
kV	Kilovolt
LUPO	Rezoning and Subdivision in terms of Land Use Planning Ordinance, Ordinance 15 of 1985
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
LDEDECT	Limpopo Department of Economic Development, Environment, Conservation and Tourism
NWA	National Water Act (Act No 36 of 1998)
PGWC	Provincial Government of the Western Cape
SAHRA	South African Heritage Resources Agency
SANRAL	South African National Roads Agency Limited
SDF	Spatial Development Framework
SIA	Social Impact Assessment
ZVI	Zone of visual influence

INTRODUCTION CHAPTER 1

Jouren Solar (Pty) Ltd is proposing the establishment of a commercial solar electricity generating facility and associated infrastructure on Portion 3 of the Farm Holsloot 47 which is located within the Siyathemba Local Municipality in the Northern Cape (refer to Figure 1.1).

The solar energy facility is proposed to accommodate several arrays of tracking or static **photovoltaic (PV) panels** and associated infrastructure on a portion of the proposed site. From a regional perspective, this area is considered favourable for the development of commercial solar electricity generating facilities by virtue of the **climatic conditions** (primarily as the economic viability of a solar energy facility is directly dependent on the annual direct solar irradiation values for a particular area), orographic conditions, relief and aspect, the extent of the site, and the availability of a direct **grid connection** (i.e. the point of connection to the National grid). The identified site is available for development, and has direct road access via the R357 and R369 regional routes which bisect the eastern corner of the proposed site.

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 Draft Scoping Report.

1.1. Summary of the Proposed Development

The Prieska Solar Energy facility is proposed to be established on Portion 3 of the Farm Holsloot 47, which lies approximately 30km north-east of Prieska within the Siyathemba Local Municipality of the Northern Cape. The site has direct road access via the R357 and R369 regional routes which bisects the proposed site.

The extent of the broader site is larger than the area required for the facility's development footprint. A proposed development footprint inclusive of associated infrastructure of <200ha can be appropriately placed within the boundaries of the broader site while aiming to avoid any environmental sensitivities identified through the EIA process. The facility can therefore be appropriately placed within the larger site taking any identified environmental constraints into consideration.

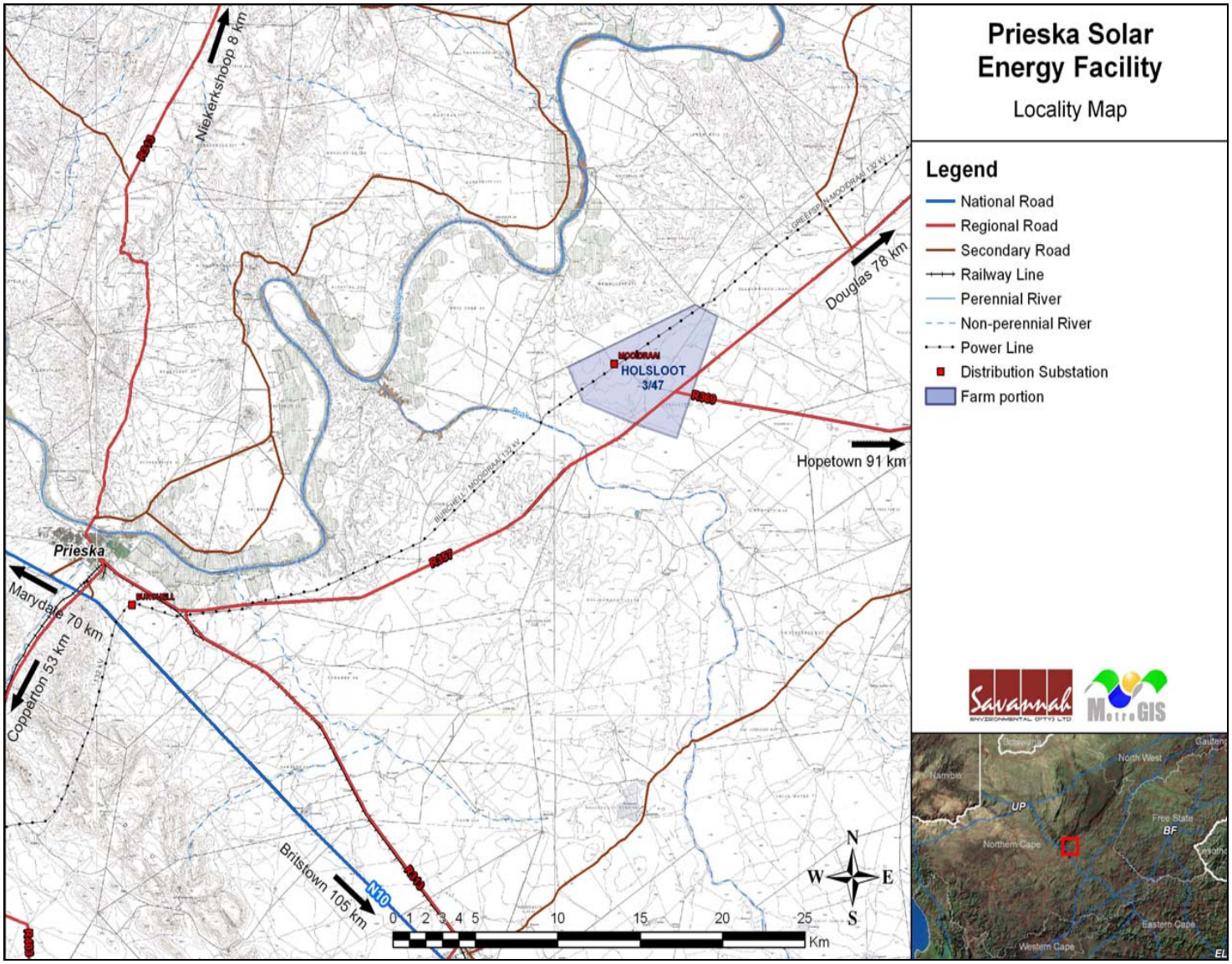


Figure 1.1: Locality map for the Prieska Solar Energy Facility

The facility is proposed to accommodate several arrays of Photovoltaic (PV) solar panels with a generating capacity of 75 MW and includes the following associated infrastructure:

» Solar panels (single or double axis).
» An on-site inverter to step up the power and a substation to facilitate the connection between the solar energy facility and the Eskom electricity grid.
» Two alternatives are being considered to evacuate the electricity from the facility.
  a) Alternative 1 a loop-in and loop out power line to connect into the existing Burchell-Mooidraai 1 132kV power line which traverses the site;
  b) Alternative 2 to connect directly into the existing Eskom Mooidraai Substation located on the site.
» Internal access roads.
» Workshop area for maintenance and storage.

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; this will serve to inform the design of the facility.

The scope of the proposed Prieska 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.

1.2. Rationale for the proposed Prieska Solar Energy Facility

The primary rationale for the proposed facility is to add new generation capacity from renewable energy to the national electricity mix and to aid in achieving the goal of a 42% share of all new installed generating capacity (new build) being derived from renewable energy forms, as targeted by the Department of Energy (DoE) (Integrated Resource Plan 2010 – 2030). In terms of the Integrated Resource Plan (IRP), approximately 8.4% of the renewable energy mix is planned to be generated from PV technologies over the next thirty years.

The South African Government has recognised the country's high level of renewable energy potential and presently has in place targets of 10 000 GWh of renewable energy by 2013 (to be produced mainly from biomass, wind, solar and small-scale hydro). This amounts to ~4% (1 667 MW) of the total estimated electricity demand (41 539 MW) by 2013. The draft Integrated Energy Resources Plan for South Africa for the period 2010 – 2030 states that the total renewable

capacity added from 2019 to 2030 should be 7 200MW (DoE, 2010), of which 600MW should come from solar energy by 2019. Large scale PV (ground based) technology is one of the qualifying renewable energy technologies included in the mix for South Africa (NERSA, 2011).

In the event of the project being developed, it will contribute to the local electricity supply and increase the security of supply to consumers. In addition, the implementation of the proposed project will provide both economic stimulus to the local economy through the construction process and long term employment in site management and operation and maintenance of the facility.

1.3. Requirement for an Environmental Impact Assessment Process

An EIA is 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 fore-warned 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).

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 **14/12/16/3/3/2/313**.

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. 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.

Jouren Solar (Pty) Ltd has appointed Savannah Environmental as the independent Environmental Assessment Practitioner (EAP) to conduct the EIA process for the proposed project.

In terms of sections 24 and 24D of NEMA, as read with EIA Regulations of GNR 543; GNR 544; GRR 545 and GNR 546, the following 'listed activities' are triggered by the proposed PV facility:

Relevant Notice	Activity No	Description of listed activity
GN 544, 18 June 2010	10	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 275 kV **The proposed facility will be required to evacuate electricity into the national grid using a distribution line of less than 275kV**
GN 544, 18 June 2010	11	The construction of: 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 **Canals, channels, or buildings exceeding 50m^2 may be required to be built within 32m of a watercourse. The relevance for any of the abovementioned items (excluding the items that have been deleted) will be confirmed during the process and by the facility layout.**
GN 544, 18 June 2010	18	The infilling or deposition of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shell, shell grit, pebbles or rock or more than 5 cubic metres from: i. A watercourse; **The development of the facility may require the excavation, removal or moving of soil from a watercourse.**
GN 545, 18 June 2010	1	The construction of facilities or infrastructure, for the generation of electricity where the output is 20 megawatts or more. **The proposed facility will have a generation**

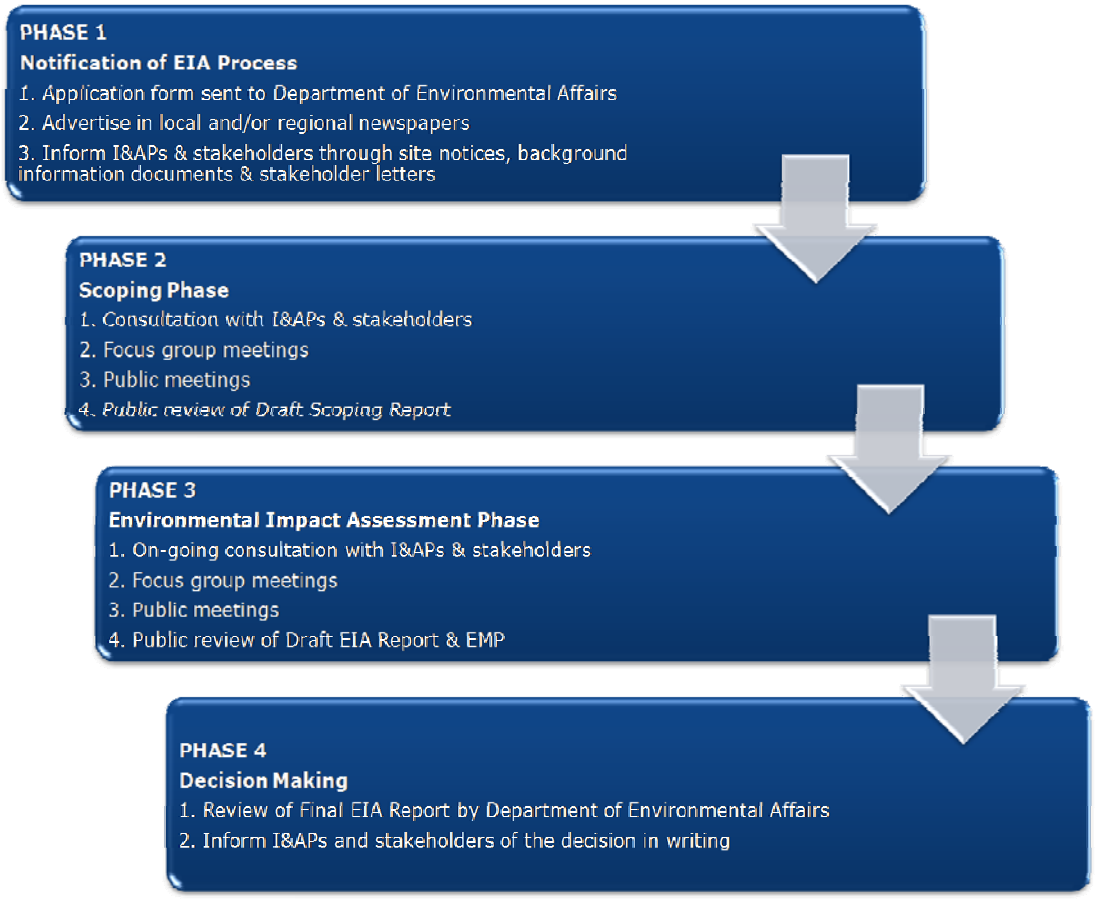
		capacity of 75MW
GN 545, 18 June 2010	15	Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; except where such physical alteration takes place for: (i) linear development activities; or (ii).agricultural or afforestation where activity 16 in this Schedule will apply. **The total area to be transformed will be more than 20 ha.**
GN 546, 18 June 2010	10(ii)	The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. **Hazardous substances to be used during construction will need to be stored on-site**.
GN 546, 18 June 2010	16(iii)& (iv)	(a) In Northern Cape: The construction of: (iii) buildings with a footprint exceeding 10 square metres in size or (iv) infrastructure covering 10 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line. **Building larger than 10 m^2 within 32 m of a watercourse may be required to be built. The relevance of this activity will be determined in the process.**

This Draft Scoping Report documents the evaluation of the potential environmental impacts of the proposed solar facility and forms part of the EIA process. Therefore, a scoping and an EIA phase are essential for the undertaking of the project and will include as follows:

» Scoping Phase - the identification of potential issues associated with the proposed project through a desktop study. Areas of sensitivity within the broader site are to be identified and delineated in order to define any environmentally sensitive or no go areas. Consultation with affected parties and key stakeholders regarding the project. Following a public review period of the draft report, this phase culminates in the submission of a Final Scoping Report and Plan for EIA to the DEA.

» EIA Phase - a detailed study of the potentially significant impacts identified in the Scoping Phase. Specialist studies will be undertaken in order to determine the nature and significance of the potential impacts. These specialist studies will be informed by existing information, field observations and input from the public participation process. Practical and achievable mitigation measures will be recommended in order to minimise potentially significant impacts identified. These recommendations will be included within an Environmental Management Programme.

An EIA is an effective planning and decision-making tool for the project developer as it provides the opportunity for the developer to be forewarned of potential environmental issues 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 Regulation to provide the competent authority with sufficient information in order to make an informed decision.



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

Savannah Environmental was contracted by Jouren Solar (Pty) Ltd as the independent EAP to undertake both Scoping and EIA processes for the proposed project. Neither Savannah Environmental nor any of its specialist sub-consultants on this project are subsidiaries of or are affiliated to Jouren Solar (Pty) Ltd. 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. Karen Jodas is a registered Professional Natural Scientist and holds Master of Science degree. She has 15 years experience consulting in the environmental field. She has successfully managed numerous EIA processes throughout South Africa, including several renewable energy projects. Ravisha Ajodhapersadh, the principle author of this report holds an Honours Bachelor of Science degree in Environmental Management and has 5 years' experience in environmental management. She is currently the responsible EAP for several renewable energy projects across the country. Curricula vitae for the Savannah Environmental project team consultants are included in Appendix A.

In order to adequately identify and assess potential environmental impacts associated with the proposed project, Savannah Environmental has appointed several specialist sub-consultants to conduct specialist impact assessments (refer to Appendix A for the curricula vitae for the specialist sub-consultants).

OVERVIEW OF THE PROPOSED PROJECT CHAPTER 2

The following chapter provides an overview of the proposed Prieska Solar Facility and details of 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 proposed is to be established on Portion 3 of the Farm Holsloot 47, which falls within the Siyathemba Local Municipality and lies approximately 30km north east of Prieska in the Northern Cape.

The proposed development inclusive of associated infrastructure can be appropriately located on the identified site, which covers a total area of approximately 31 km^2. The extent of the broader site is larger than the area required for the facility's development footprint. Therefore, the PV panels and the associated infrastructure can be appropriately placed within the boundaries of the broader site while aiming to avoid any environmental sensitivity identified through the EIA process.

The facility is proposed to include several arrays of photovoltaic (PV) solar panels with a generating capacity of approximately 75 MW of electricity and includes the following associated infrastructure:

» Solar panels.
» An on-site inverter to step up the power and a substation to facilitate the connection between the solar energy facility and the Eskom electricity grid.
» Two alternatives are being considered to evacuate the electricity from the facility. Alternative 1 would be a loop-in and loop out power line to connect into the existing Burchell - Mooidraai 1 132kV power line which traverses the site. Alternative 2 will be to connect directly into the existing Eskom Mooidraai substation within the site.
» Internal access roads
» Workshop area for maintenance and storage

2.1 Project Alternatives

In accordance with the requirements of the EIA Regulations, project alternatives have been considered within the EIA process and are detailed below.

2.1.1 Site Alternatives

No site alternatives are proposed for this project as the placement of a solar facility is strongly dependent on several factors including climatic conditions (primarily as the economic viability of a solar energy facility is directly dependant on the annual direct solar irradiation values for a particular area), orography, relief and aspect, and the availability of a grid connection (i.e. the point of connection to the National grid). The proposed site has been identified by Jouren Solar (Pty) Ltd as being highly desirable for a solar energy facility in terms of the following characteristics:

Site Extent

The proposed development inclusive of associated infrastructure can be appropriately located on the identified site, which covers a total area of approximately 31 km^2.

Site access

The site can be easily accessed via the R357 and R369 which bisect the eastern corner of the proposed site.

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. The climate of the Prieska area is categorised as arid. The site falls within an area with a Mean Annual Precipation (MAP) of approximately 242 mm of rain per year, with most of it occurring during autumn. Single, rare, heavy showers can account for as much as the normal annual precipitation. Prieska experiences hot days and cold nights with the average summer temperatures of approximately 33 °C and the average winter night time temperatures of approximately 1 °C in June and July.

Gradient

A level surface area (i.e. with a minimal gradient in the region of 1%) is preferred for the installation of PV panels. The slope of the proposed site is considered to be acceptable from a development perspective, which reduces the need for extensive earthworks and associated levelling activities, thereby minimising environmental impacts.

2.1.2. Grid Connection

The existing Eskom Burchell - Mooidraai 1 132 kV power line traverses the proposed site. In addition, the Mooidraai Distribution Substation is located on the

proposed site. Two alternatives are being considered to evacuate the electricity from the facility:

» Alternative 1: a loop-in and loop out power line configuration to connect the on-site substation to the existing Burchell-Mooidraai 1 132kV power line which traverses the site.
» Alternative 2: connect the on-site substation directly into the existing Eskom Mooidraai Substation located within the site boundaries.

The facility would, via either alternative, have a direct point of connection to the Eskom grid. These alternatives will be assessed further within the EIA phase.

2.1.3. Layout Design Alternatives

The proposed facility is expected to have a development footprint of <200 ha. Therefore the facility and its associated infrastructure (i.e. power lines and internal roads, etc) can be appropriately positioned within the broader site to avoid areas of sensitivity. 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 greater 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 alternative routes for the power line corridor and the access roads. The aim of this planning process is to avoid environmentally sensitive areas as far as possible.

Preferred alternatives will be assessed further within the EIA phase.

2.1.4. The 'Do-Nothing' Alternative

The 'Do-Nothing' alternative is the option of not constructing the proposed Prieska Solar Energy Facility. This alternative would result in no environmental impacts on the site or surrounding area. From a local perspective, the identified site, which is zoned agricultural and utilised for grazing livestock, would not be impacted on, from an environmental perspective, and could be utilised for future agricultural activities. However, should this alternative be selected then the socio-economic and environmental benefits of this renewable energy facility will not be realised. These benefits are explored in further detail in the South Africa REFIT Regulatory Guideline published by NERSA (March 2009), and 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.
- **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 ~1% of global GHG emissions and is currently ranked 9th worldwide in terms of per capita CO_2 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.
- **Protecting the natural foundations of life for future generations:** Actions to reduce our disproportionate carbon footprint can play an important part in ensuring our role in preventing dangerous anthropogenic climate change; thereby securing the natural foundations of life for generations to come.

This alternative will be assessed further within the EIA phase.

2.2 Solar Energy as a Power Generation Option

The use of solar radiation for power generation is considered a non-consumptive use of a natural resource which produces zero greenhouse gas emissions. The generation of renewable energy will contribute to South Africa's electricity market which has, to date, been heavily dominated by coal-based power generation. The advancement of renewable energy is a priority for South Africa as the government has set a 10-year target of 10 000 GWh (Gigawatt Hour) of electricity by 2013, as part of its White Paper on Renewable Energy. Furthermore, recent policy highlights the desirability of clean; green energy and solar generated energy will play a significant role in reaching these quotas.

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 refers to photons of light knocking electrons into a higher state of energy to create electricity.

Solar PV facilities comprise of the following components:

The Photovoltaic cell
A PV cell is made of silicone which acts as a semiconductor used to produce the photovoltaic effect. 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 placed behind a protective glass sheet and fixed to a support structure. Each PV cell is positively charged on one side and negatively charged on the other side, with electrical conductors attached to either side to form a circuit. This circuit captures the released electrons in the form of an electric current (direct current).

The Inverter
An inverter (located in an inverter cabin) is required to convert the direct current (DC) into alternating current (AC). The transformer installed inside the substation steps up the power prior to the evacuation into the power line.

The support structure
The PV panels will be fixed to a support structure set at an angle so to receive the maximum amount of solar radiation. Single or double axis trackers will be used. The angle of the panel is dependent on the latitude of the proposed facility and the angles may be adjusted to optimise for summer or winter solar radiation characteristics. The PV panels are designed to operate continuously for more than 20 years and with relatively low maintenance.

2.3. 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.

2.3.1. Conduct Surveys

Prior to initiating construction, a number of surveys will be required including, but not limited to:

» Geotechnical survey - the geology and topography of the development footprint will be surveyed. The geotechnical study will focus on flood potential, foundation conditions, potential for excavations, and the availability of natural construction materials. The geotechnical examination will include surface and subsurface exploration, soil sampling and laboratory analysis.
» Site survey - will be done for the finalisation of the design layout of the solar arrays, and the other associated infrastructure. The micro-siting footprint will consider any environmental sensitivity identified during the EIA Phase investigations and will need to be confirmed in line with the Environmental Authorisation issued for the facility.

2.3.2. Establishment of Access Roads to the Site

The provincial routes i.e. R357 and R369 bisect the eastern corner of the site. Access to the site will be via these two existing tarred roads. Within the site itself, access will be required from this existing road to the facility for construction purposes (and limited access for maintenance during operation). 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 outcome 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.

2.3.3. 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.

2.3.4. 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)[2] by virtue of the dimensional limitations (i.e. 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 line.

2.3.5 Establishment of Laydown Areas on Site

Laydown and storage areas will be required for the typical construction equipment which will be required on site. Once the required equipment has been transported to site, a dedicated equipment construction camp and laydown area will need to be established adjacent to the workshop area. The equipment construction camp serves to confine activities and storage of equipment to one designated area to limit the potential ecological impacts associated with this phase of the project. The laydown area will be used for the assembly of the PV panels and the general placement/storage of construction equipment.

2.3.6 Construct Substation

A dedicated substation would be constructed on the site to facilitate the connection between the PV facility and the Eskom grid. The construction will include site clearance and levelling and construction of access road to substation site; construction of terrace and substation foundation; assembly and installation of equipment and connection of conductors to equipment; and rehabilitation of disturbed areas and protection of erosion sensitive areas.

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

2.3.7 Establishment of Ancillary Infrastructure

Ancillary infrastructure includes a 132kV overhead power line feeding into the Eskom electricity, workshop, storage areas as well as a contractor's equipment camp.

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.

2.3.8 Connect Substation to Power Grid

Two alternatives are considered to evacuate the electricity from the facility. Alternative 1 would be a loop-in and loop out power line to connect into the existing Burchell - Mooidraai 1 132kV power line which traverses the site. Alternative 2 will be to connect directly into the existing Eskom Mooidraai Substation located on the project development site. The servitude cleared for the power line will be used for erecting the power line towers and the stringing of the power line.

2.3.9 Undertake Site Remediation

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. Where relevant; disturbed areas must be rehabilitated/re-vegetated with appropriate natural vegetation and/or seed mix. Re-vegetated areas may have to be protected from wind erosion and maintained until an acceptable plant cover has been achieved. All temporary facilities, equipment and waste materials will be removed from site. Erosion control measures (i.e. drainage works and anti-drainage lines), to minimise loss of topsoil and control erosion.

2.5. Operation Phase

The electricity that is generated from the PV panels will be stepped up through the on-site generator transformer. The power will be evacuated from the facility directly to the Eskom grid via a power line to a) loop-in and loop out of the existing Burchell-Mooidraai 1 132kV power line which traverses the site; of b) to connect directly into the existing Eskom Mooidraai Substation located on the site.

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.

Maintenance is mainly mechanical and electrical. Cleaning would be undertaken using a vehicle based compressor and a wash down with water once or twice annually, as required. Water usage is minimal.

2.6. Decommissioning Phase

The solar energy facility is expected to have a lifespan of approximately 20 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.

2.6.1. Site Preparation

Site preparation activities will include confirming the integrity of the access to the site to accommodate the required equipment (e.g. lay down areas, construction platform) and the mobilisation of decommissioning equipment.

2.6.2. 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 Environmental Impact Assessment (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 generally forms part of the feasibility study for a proposed project, the outcomes of which inform the final design of a development.

The EIA process comprises two Phases i.e. **Scoping Phase** and an **EIA Phase**. The Scoping Phase culminates in the submission of a Scoping Report to the Department of Environmental Affairs 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.

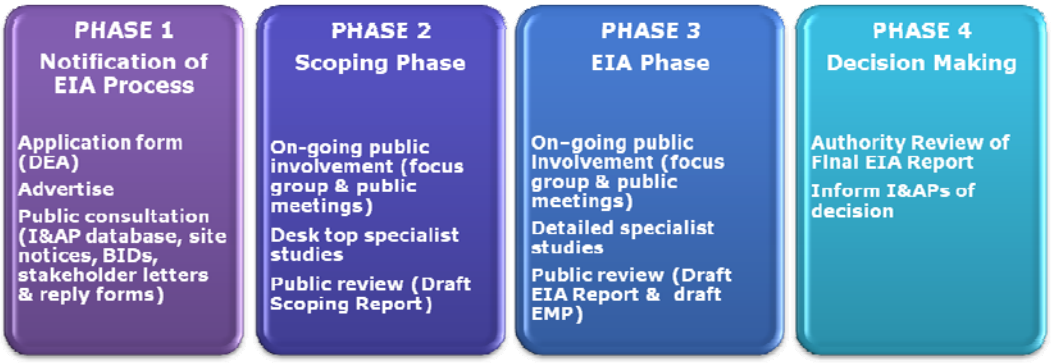


Figure 3.1: The four phases of an EIA Process

The Scoping Phase for the proposed Prieska Solar Energy Facility has been undertaken in accordance with the EIA Regulations published in GN 33306 (18 June 2010), as amended, in terms of Section 24(5) of NEMA. This Draft Scoping Report aimed to identify and briefly describe the receiving environment and the potential environmental impacts associated with the proposed project and to define the extent of the specialist studies required within the EIA Phase. 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 developer (Jouren Solar Pty Ltd), 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.

3.1. Objectives of the Scoping Phase

The Scoping Phase aimed to:

» Define 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 and specialist studies.
» 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 and desk-top specialist studies, 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.

3.2. 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 (DOE):* 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). Solar energy projects are 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.
» *South African Civil Aviation Authority (SACAA):* This Department is responsible for aircraft movements and radar, which are aspects that influence project's location and planning.
» *Department of Agriculture, Forestry and Fisheries (DAFF):* This Department is the custodian of South Africa's agriculture, fisheries and forestry resources and is primarily responsible for the formulation and implementation of policies governing the Agriculture, Forestry and Fisheries Sector. This Department has published a guideline for the development of wind /solar projects on agricultural land.
» *Department of Mineral Resources:* Approval from the Department of Mineral Resources (DMR) may be required to use land surface contrary to the objects of the Act in terms of section 53 of the Mineral and Petroleum Resources Development Act (Act No 28 of 2002). In terms of the Act approval from the Minister of Mineral Resources is required to ensure that proposed activities do not sterilise a mineral resources that might occur on site.
» *South African National Roads Agency (SANRAL):* This agency of the Department of Transport is responsible for all National road routes.

At the Provincial Level, the main regulatory agencies are:

» *Northern Cape Department of Environment and Nature Conservation (DENC):* This Department is the commenting authority for the application of environmental authorisation for this project.
» *Department of Roads and Public Works (Northern Cape).* This Department is responsible for roads and the granting of exemption permits for the conveyance of abnormal loads on public roads.
» *The Department of Agriculture:* This Department is responsible for all matters which affects agricultural land.
» *Department of Water Affairs:* This Department is responsible for evaluating and issuing licenses pertaining to water use.

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 Siyathemba Local 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.

3.2.2 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 (GN R543, GN R544 and GN R546 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) (EIA) Regulations of 2010 (Draft Guideline; DEAT,2010)
  * Public Participation in the EIA Process (DEA,2010)
» International guidelines – the Equator Principles and the International Finance Corporation (IFC) and World Bank Environmental, Health, and Safety Guidelines for Wind Energy (2007).

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 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 Prieska Solar Energy Facility

Legislation	Applicable Sections
National Legislation	
Constitution of the Republic of South Africa (Act No 108 of 1996)	» 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)

Legislation	Applicable Sections
	» Sufficient water (s27.1.b) » Access to information (S32) » Right to just administrative action (S33) » Recognition of international agreements (S231)
National Environmental Management Act (Act No 107 of 1998)	» 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 environment » NEMA EIA Regulations (GN R543 of 18 June 2010) published in terms of Chapter 5 of the NEMA » Public Participation (S2) » 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 impact on the environment (S30) » Appeals against decisions made by authorities (S43)
Environment Conservation Act (Act No 73 of 1989)	» National Noise Control Regulations (GN R154 dated 10 January 1992)
National Heritage Resources Act (Act No 25 of 1999)	» 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)

Legislation	Applicable Sections
	» 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)	» Provides for the MEC/Minister to list ecosystems which are threatened and in need of protection (S52) – none have as yet been published » Provides for the MEC/Minister to identify any process or activity in such a listed ecosystem as a threatening process (S53) - none have as yet been published » A list of threatened & 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). » 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)	» National, provincial and local ambient air quality standards (S9 - 10 & S11) » Listed Activities (S21) » Atmospheric Emissions Licenses (S22) » Measures in respect of dust control (S32) – no regulations promulgated as yet » Measures to control noise (S34) - no regulations promulgated as yet
Conservation of Agricultural Resources Act (Act No 43 of 1983)	» Prohibition of the spreading of weeds (S5) » Classification of categories of weeds & invader plants (Regulation 15 of GN R1048) and restrictions in terms of where these species may occur » Requirement and methods to implement control measures for alien and invasive plant species (Regulation 15E of GN R1048) » Soil protection/conservation, and erosion control
National Water Act (Act No 36 of 1998)	» 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

Legislation	Applicable Sections
	purposes such as reasonable domestic use, domestic gardening, animal watering, fire fighting and recreational use, as set out in Schedule 1 » 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 (S21) » Requirements for registration of water use (S26 and S34) » Definition of offences in terms of the Act (S151)
Water Services Act (Act No 108 of 1997)	» No person may dispose of industrial effluent except in a manner approved by the water services provider.
Aviation Act (Act No 74 of 1962)	» 13th amendment of the Civil Aviation Regulations (CARs) 1997 » The Minister of Transport has under section 22(1) of the Aviation Act, 1962 made the regulations in the Schedule hereto. » Obstacle limitations and marking outside aerodrome or heliport - CAR Part 139.01.33
National Environmental Management Waste Act (Act No 59 of 2008)	» Waste management measures » Regulations and schedules (Schedule A & B) » Listed activities requiring waste licenses » Waste disposal practices (S20) » Contamination
National Forests Act (Act No 84 of 1998)	» Protected trees » Conservation of forests
National Roads Act (Act No 7 of 1998)	» Policy concerning use and management of national roads.
Guideline Documents	
South African National Standard (SANS) 10328, Methods for environmental noise impact assessments in terms of NEMA No. 107 of 1998	» Prediction of impact that noise emanating from a proposed development would have on occupants of surrounding land by determining the rating level. » Noise limits are based on the acceptable rating levels of ambient noise contained in SANS 10103
Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads	» 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
The White Paper on Renewable Energy (2003)	» National targets for renewable energy generation
Khai-Ma Local Municipality Local	» To provide the overarching strategic framework

Legislation	Applicable Sections
Municipality 2010/2011	for the sustainable long-term management of the relevant municipality
Draft Guidelines for the Evaluation and Review of Applications Pertaining to Wind and solar Farming on Agricultural Land (Sept 2010).	» This document provides an outline of the type of agricultural / soil study required for wind and solar energy facilities and for submission to DAFF.
Equator Principles (2006) (as updated) and IFC performance standards.	» The Equator Principles are a set of standards for determining, assessing and managing social and environmental risk in project financing. Lenders who seek finance from foreign banks will have to comply with the Equator Principles.
World Bank Standards (IFC Guidelines) (2007). Environmental, Health, and Safety Guidelines for Wind Energy	» The EHS Guidelines for wind energy include information relevant to environmental, health, and safety aspects of onshore and offshore wind energy facilities.

3.3. Methodology for the Scoping Phase

The Scoping Phase has been undertaken in accordance with the EIA Regulations published in Government Notice 33306 of 18 June 2010, in terms of NEMA. Key tasks undertaken within the scoping Phase are illustrated in Figure 3.1 and are discussed in further detail below.

3.3.1 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 **14/12/16/3/3/2/313**.

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

3.3.2 Public Participation Process

The public participation process will be undertaken by Savannah Environmental. The aim of the public participation process would be 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 will be 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).

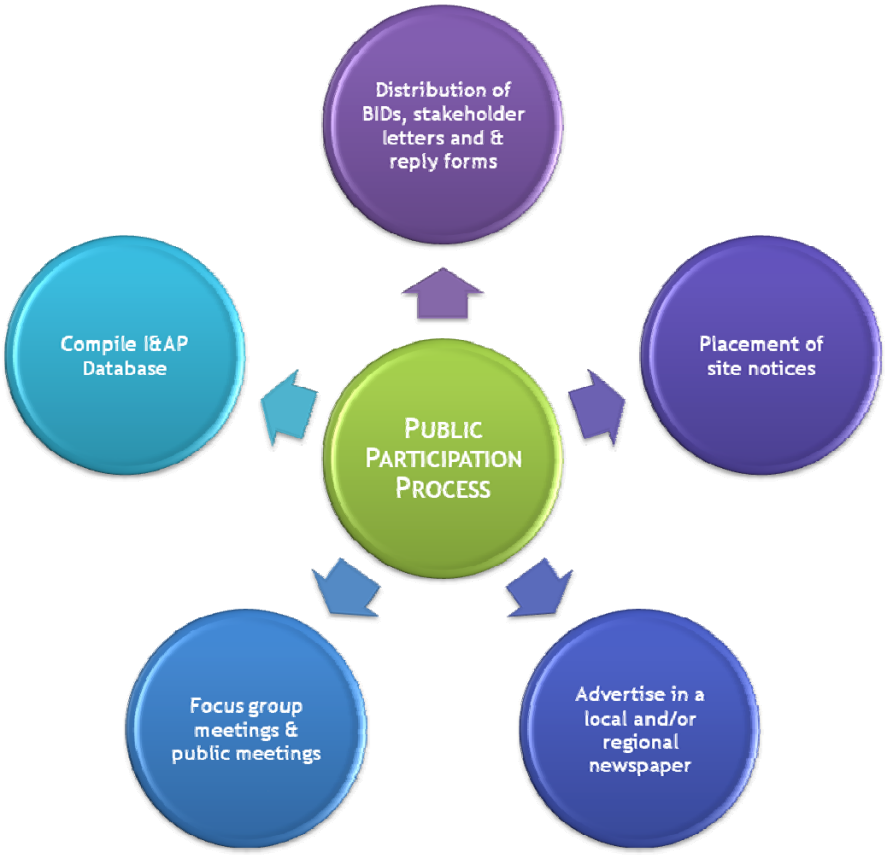


Figure 3.2 Activities included as part of the public participation process

Identification of IAPs and establishment of a Database

The first step in the public involvement process would be to initiate the identification of relevant stakeholders and interested and affected parties (I&APs). Identification of I&APs will be undertaken through existing contacts and databases, recording responses to site notices and 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)
» Siyathemba Local Municipality
» Potentially affected and neighbouring landowners
» Conservation authorities
» Industry and business
» CBOs and other NGOs.

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

3.3.3 Identification and Recording of Issues and Concerns

When the public review period has lapsed, comments from different stakeholders will be addressed and consolidated in the Final Comments and Response Report, which will be included in the Final Scoping Report submitted to DEA. 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.

3.3.4 Evaluation of Issues Identified through the Scoping Process

Potential direct and indirect environmental impacts that may arise within the Scoping process will be evaluated through desk-top studies

3.3.5 Public Review of Draft Scoping Report and Feedback Meeting

This is the **current stage** of the Scoping Phase. The Draft Scoping Report has been made available for public review from 03 September 2012 – 03 October 2012 at the following locations:

» Prieska Public Library
» www.savannahsa.com

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

Date: 12 September 2012
Venue: Omega Community Hall, Prieska
Time: 17h00

3.3.6 Final Scoping Report

The final stage in the Scoping Phase will entail the addressing capturing of responses from I&APs on the Draft Scoping Report in order to refine this 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.

DESCRIPTION OF THE RECEIVING ENVIRONMENT CHAPTER 4

This section of the Draft Scoping Report provides a description of the environment that may be affected by the proposed Prieska Energy Facility project. This information is provided in order to assist the reader in understanding the receiving environment within which the proposed facility is situated. 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. A more detailed description of each aspect of the affected environment is included within the specialist scoping reports contained within Appendices F – J.

4.1 Regional Setting: Location of the Study Area

The site identified for the proposed Prieska Solar Energy Facility and associated infrastructure is situated on Portion 3 of the Farm Holsloot 47 which is located within the Siyathemba Local Municipality (SLM) in the Northern Cape Province. The town of Prieska, which functions as the administrative seat of the SLM, is located ~ 30 km south-west of the site. The Siyathemba Local Municipality is one of eight local municipalities that make up the Pixley Ka Seme District Municipality (PKSDM).

The main settlements in the Siyathemba Local Municipality are the towns of Prieska, Marydale, Niekerkshoop, Draghoender and Copperton. The town of Prieska is located on the southern bank of the Orange (Gariep) River, approximately 30 km south-west of the proposed Solar Energy Facility site. Prieska is the largest town in the Siyathemba Local Municipality.

4.2 Climatic Conditions

The climate of the area is typical of the desert and is categorised as arid. The area normally receives about 132 mm of rain per year. From May to December rainfall is minimal, with most rainfall occurring from January to April, peaking in autumn - March. Temperatures in summer peak during December and January at a daily average of 32.7˚C, with an average of 17.9˚C for June. During July night temperatures are on average 1.3˚C, with an average of 37 frost days per annum.

4.3. Land-Use

Livestock farming accounts for ~98.7% of agricultural land use and ~75% of the Siyathemba Local Municipality's agricultural GDP. At least 12 major crop types are cultivated in the Gariep Valley (mainly east of Prieska), the most important of which are maize and wheat, peanuts, lucerne (alfalfa) and table grapes. Stock farming operations are mainly based on small stock (sheep, goats) on spatially extensive commercial farms. Both wool and carcasses are produced. Game farming (hunting) is emerging as a key diversification strategy. The main land uses in the study area are linked to extensive agriculture (stock farming), mining and game farming. Due to climatic conditions of the study area it is therefore greatly devoid of any rain fed agriculture or cultivation. Sheep, goat and game farming occur throughout the region at a less intensive scale.

The site for the proposed solar energy facility falls within the land capability class *Non-Arable With Low Potential Grazing Land*. The ''best use'' for the area is for grazing with sheep and goats. The grazing capacity of the region varies between 26 ha/LSU and 40 ha/LSU. The calculated carrying capacity of the site is at best 122 LSU's. There are no cultivated lands visible on the Google Earth Image of the site, a fact that will have to be verified during the EIA process.

There are no agricultural important infrastructure (i.e. silos, irrigation lines, pivot points, channels and feeding structures, etc.) or any conservation works (i.e. contour banks, waterways, etc.), that will be interfered with by the solar energy facility, visible on the 1:50,000 topographical maps or Google Earth images of the site. There are no formally protected or conservation areas present within the study area.

4.4. Land Cover of the Study Area

As indicated on Figure 4.1, land cover consists primarily of *thicket* (concentrated in the north and east), interspersed with *shrubland* (concentrated in the west and south). The area along the Orange River is dominated by *cultivated land*, and some very small patches of *woodland* are dotted throughout the study area, as well as on the proposed site. A *plantation* is indicated as being present to the west of the site.

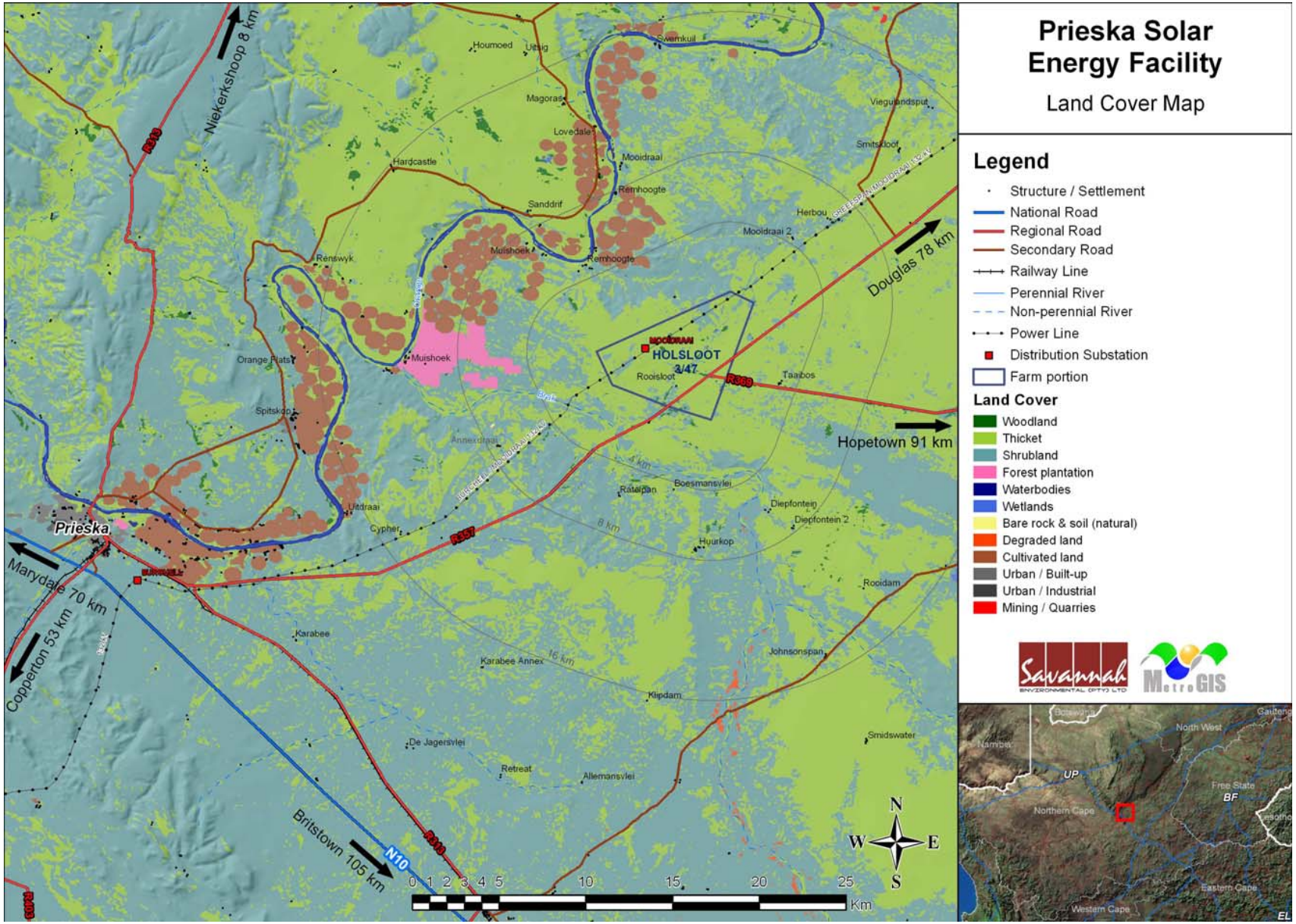


Figure 4.1: Broad land cover and land use patterns of the study area

4.5. Infrastructure, Access and Transport Routes in the Study Area

The site is located adjacent to the intersection between the R357 and the R369. These roads are regional connectors leading to Douglas and Hopetown respectively. Other connectors include the R313 in the west of the study area leading to Niekerkshoop in the north and Britstown in the south. The R369 provides access to Hopetown. The infrastructure includes the Burchell-Mooidraai 1 132kV power line, which traverses the site from the south west to the north east, and two substations. The Moodraai Substation is located on the proposed site.

4.6. Biophysical Characteristics of the Study Area

4.6.1. Topography

The study area is situated on land that has an elevation that varies from 950m above sea level along the Orange River to about 1400m in the mountains in the north west and south west. The topography of the study site is relatively flat and located on the plains. The *Plains* are situated in the central and eastern part of the study area, and the *Hills* in the north west and south west. These hills form part of the *Asberge* and the *Doringberge* respectively. There are no obvious topographical features on site nor are there any obvious drainage lines and/or wetland features (refer to Figure 4.2 below).

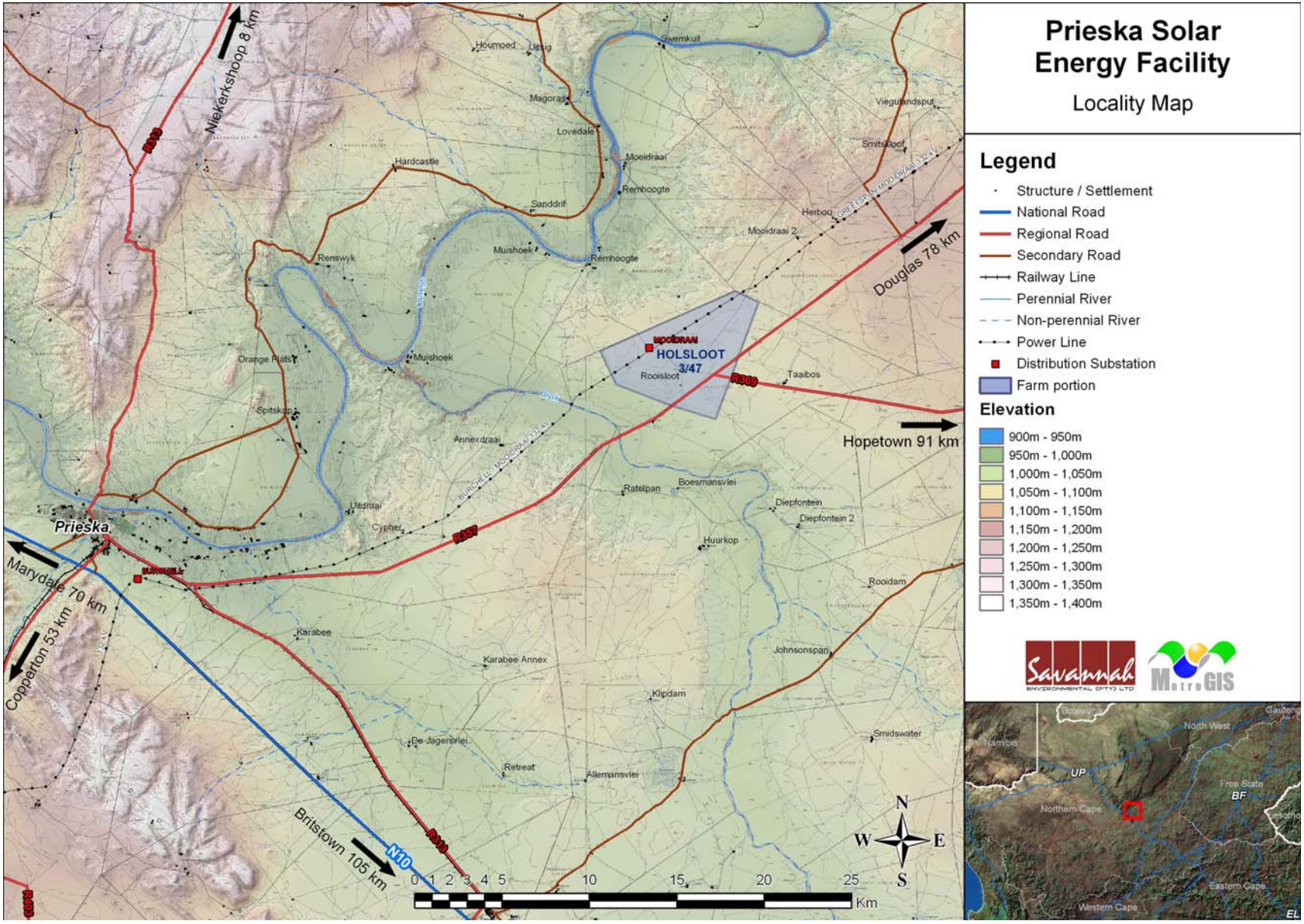


Figure 4.2: Location of the proposed facility indicating shaded relief (topography and elevation above sea level) of the study area

4.6.2. Land Types (Soils) & Agricultural Potential

The study site falls into the **Ag, Ae**, and **Fc** land types (Land Type Survey Staff, 1987). Table 4.1 summarises the land types applicable and their coverage in percentage on site.

Table 4.1: Land types and their coverage expressed as a percentage on site.

Land Types	Coverage in Percentage (%)
Ag136	70
Ae301	20
Fc567	5
Fc568	5

Figure 4.3 provides the land type map of the site. It can be seen from the map that most of the site falls within the Ag136 land type and that only a small portion of the Prieska Solar Energy Facility falls within the Fc567 and 568 land types. A brief description of the land types Ag136, Ae301, Fc567 and Fc568 in terms of soils, land capability, land use and agricultural potential is provided below:

Land Type Ag136

Soils: Ag land types denote areas where there are red-yellow apedal soils which are freely drained. This type of soil has a high base status with an effective depth of less than 300mm deep on average.

Land capability and land use: The site lies in an area that is non-arable with low potential grazing land.

Agricultural potential: There is low agricultural potential due to soil conditions on site hence it is expected to be generally ''not suited'' for cultivation

Land Type Ae301

Soils: Ae land types denote an area that has red-yellow apedal soils that is freely drained with a high base status and with an effective depth of more than 300mm deep on average.

Land capability and land use: The site lies in an area that is non-arable with low potential grazing land.

Agricultural potential: There is low agricultural potential due to soil conditions on site hence it is expected to be generally ''not suited'' for cultivation.

Land Type Fc567

Soils: The Fc group of land types has Glenrosa and/or Mispah soil forms (other soils may occur), with an effective depth of less than 300mm deep on average.

Land capability and land use: The site lies in an area that is non-arable with low potential grazing land.

Agricultural potential: There is low agricultural potential due to soil conditions on site hence it is expected to be generally ''not suited'' for cultivation.

Land Type Fc568

Soils: The Fc group of land types has Glenrosa and/or Mispah soil forms (other soils may occur), with an effective depth of less than 300mm deep on average.
Land capability and land use: The site lies in an area that is non-arable with low potential grazing land.
Agricultural potential: There is low potential due to soil-conditions on site hence it is expected to be generally ''not suited'' for cultivation.

According to the classification of the AGIS Website of the Department of Agriculture, Fisheries & Forestry – www.agis.agric.za - and Department of Agricultural Development (1991) the site falls within an area with (i) soils with minimum development, usually shallow, on hard or weathering rock, with or without intermittent diverse soils, and where lime is generally present in the landscape and (ii) red soils with a high base status. The following soil forms are to be expected to be present on the site, i.e. Hutton, Oakleaf, Mispah, Glenrosa, Clovelly, Valsrivier and Swartland.

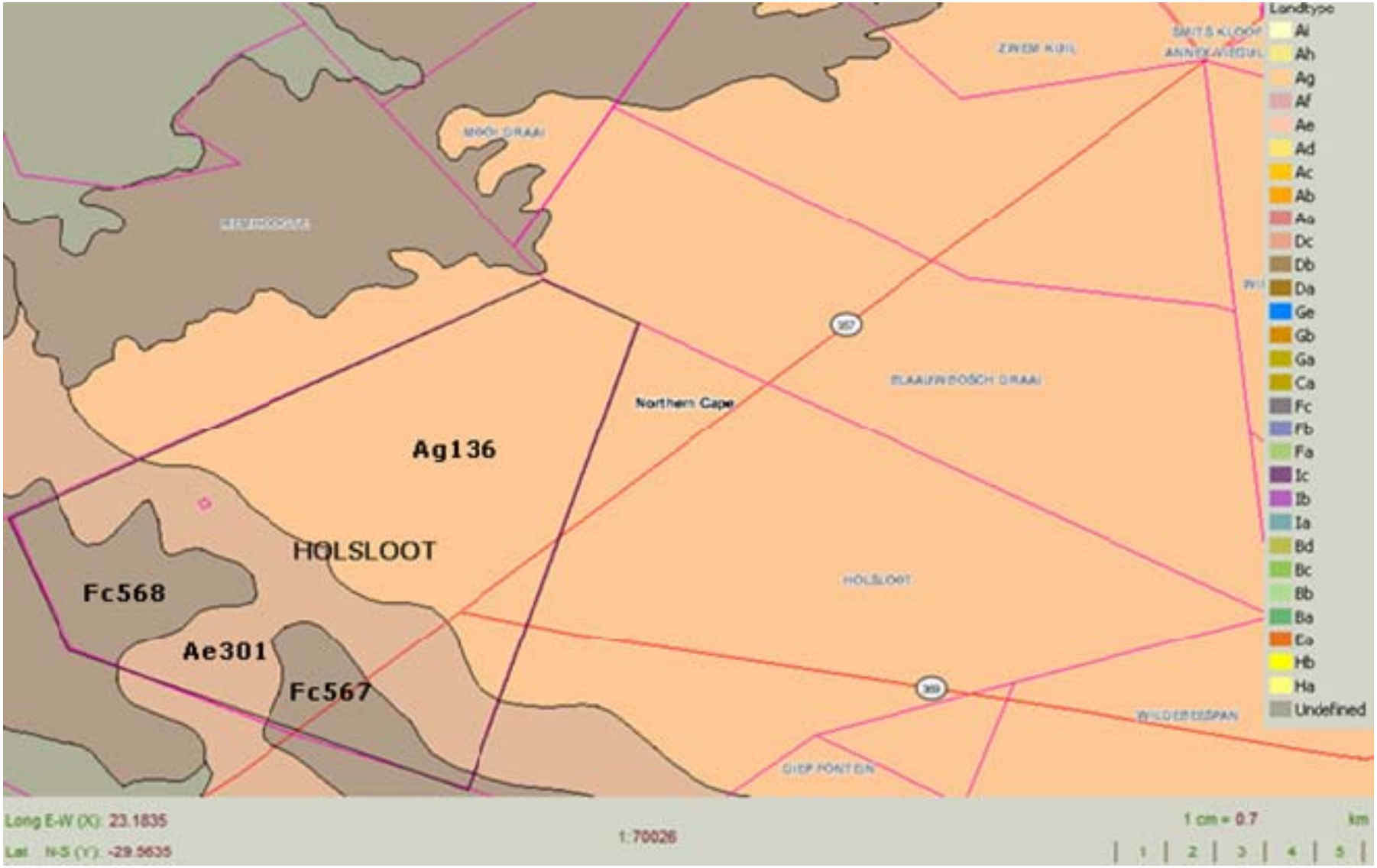


Figure 4.3: Land types map of the Prieska Solar Energy Facility and surrounding area

4.7. Ecological Profile

4.7.1. Vegetation

A map showing the vegetation of the study area and site is shown in Figure 4.4. The study area is part of the Northern Upper Karoo with expected outliers of the Upper Gariep Alluvial Vegetation as defined by Mucina and Rutherford (2006), considered as least threatened. Surrounding the study area are larger tracts of Upper Gariep Alluvial Vegetation. The Northern Upper Karoo is described as a shrubland dominated by dwarf karoo shrubs and grasses. On deeper soils, higher shrubs of *Acacia mellifera* subsp. *detinens* and *Rhigozum trichotomum* can become invasive, forming dense stands where the grass and low shrub layer has been significantly weakened. Other prominent taller shrubs and trees include Boscia albitrunca (nationally protected) ad several *Lycium* species. The dwarf shrub layer is mostly dominated by *Chrysocoma ciliata*, *Pentzia* species, *Eriocephalus* species, *Salsola* species, and *Zygophyllum* species. Prominent grasses are of the genera *Aristida, Eragrostis, Enneapogon,* and *Stipagrostis* (Mucina and Rutherford 2006).

This vegetation type is regarded as least threatened, even though none of it is officially protected, with only about 4% transformed by cultivation or infrastructure. Erosion throughout the range of this vegetation type ranges from very low to moderate (Mucina and Rutherford 2006). Several areas of this vegetation type are infested with alien *Prosopis* species, especially along drainage lines.

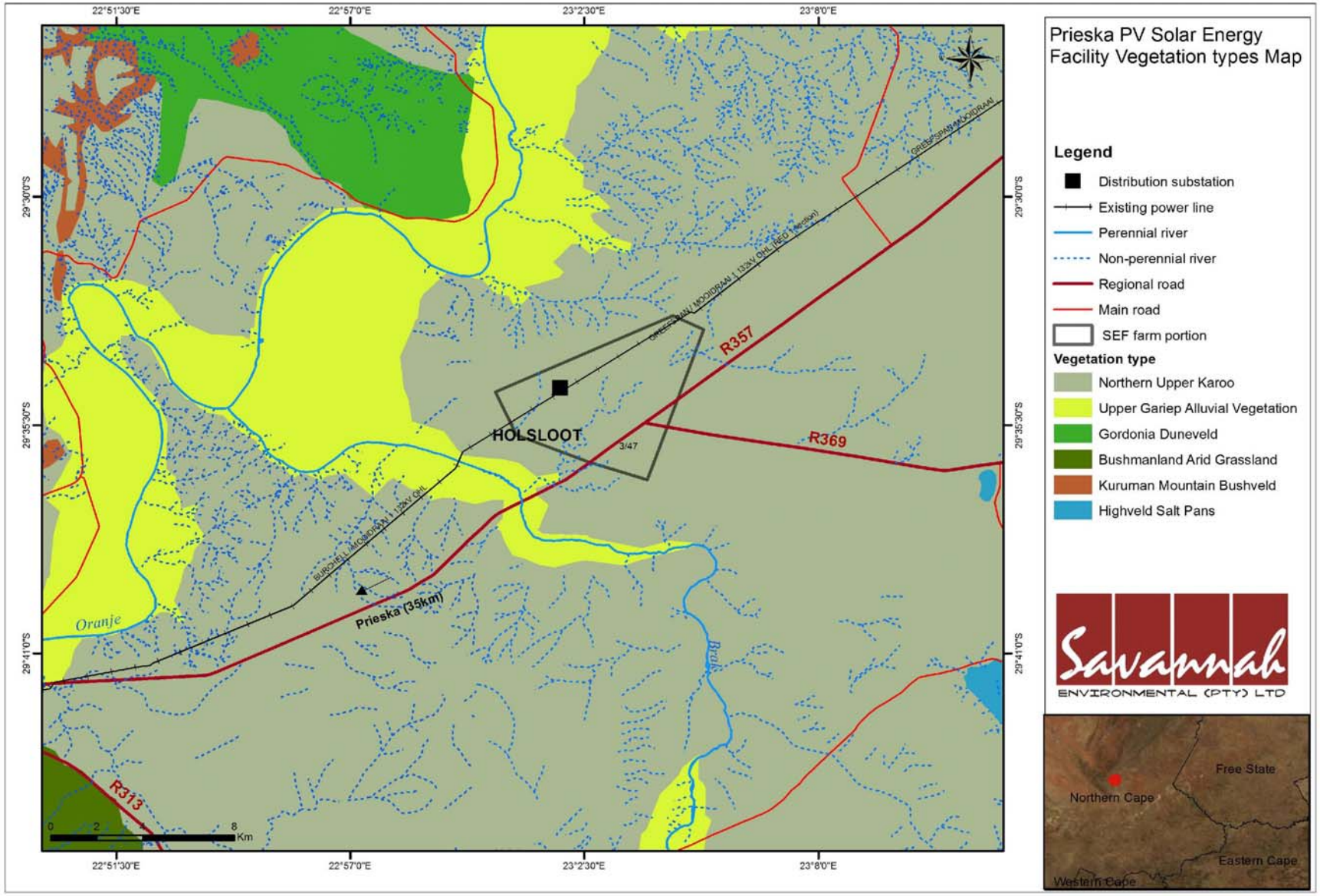


Figure 4.4: Vegetation map types for the study area

4.7.2. Red List Plant Species

A list of plant species that has been recorded to date in the representative grid has been obtained from the POSA SANBI website. POSA generated species lists also contain updated Red Data species status according to the Red List of South African Plants 2009 published by SANBI in *Strelitzia* 25 (Raimondo *et al.* 2009). This list has been evaluated against the SANBI Species Status database and provincial legislation to obtain a list of species that are protected and/or in any way threatened, that may occur in the study area and that could be affected by the proposed development. The presence of such species on or traversing the study area will have to be verified during field observations. The potential red data plant species that may occur on the site include:

» Succulents - *Hoodia gordonii* and *Lithops lesliei subsp. burchellii*
» Geophytes - *Crinum bulbispermum* and *Disa draconis*
» Low Shrub - *Erica aspalathifolia var. aspalathifolia*

It is unlikely that the development will compromise the survival of any of the species of conservation concern once the final layout has been designed in accordance to findings of a field investigation. Plant species of conservation concern will only be identifiable during the growing season.

4.7.3. Red List and Protected Fauna and Avifauna

Bird and mammal species of conservation concern (red-listed) are mostly restricted to birds and small mammals. There are a number of vulnerable and one endangered species that could occur in the study area, but they are no threatened, near threatened or protected species that occur in available habitats in the proposed study area although this will be confirmed in the EIA phase. The following red data bird species may utilised habitat on the site:

Common Name	**Species Name**	**Status**
Blue Crane	*Anthropoides paradiseus*	Endangered
Tawny Eagle	*Aquila rapax*	Vulnerable
Kori Bustard	*Ardeotis kori*	Vulnerable
Black Stork	*Ciconia nigra*	Vulnerable
Saddlebill Stork	*Ephippiorhynchus senegalensis*	Endangered
Cape Vulture	*Gyps coprotheres*	Endangered
Ludwig's Bustard	*Neotis ludwigii*	Vulnerable

The following red data fauna may occur on the site:

Common Name	Species Name	Status
Sclater's Golden Mole	*Chlorotalpa sclateri*	Little known
Spectacled Dormouse	*Graphiurus ocularis*	Rocky areas, rare
Black-footed Cat	*Felis nigripes*	Rare
African Wild Cat	*Felis lybica*	Vulnerable
Honey Badger	*Mellivora capensis*	Vulnerable
Aardwolf	*Proteles cristatus*	Rare
Antbear / Aardvark	*Orycteropus afer*	Vulnerable
Pangolin	*Mani temminckii*	Vulnerable

4.7.4. Water Resources

The site is located approximately 5km from the Orange River at its closest point. There are no major rivers on the site itself, however drainage is channelled through several tributaries / drainage lines of variable slope and size to ultimately link up to the Orange River beyond the study area. Drainage areas and dams that could be remotely identified on the site and are shown in Figure 4.4. Within these drainage lines, few small dams have been created for agricultural purposes, but with the generally very low rainfall of the area, are often dry. According to the National Water Act, the drainage lines (most likely non-perennial) which travers the site, are classified as wetlands or water resources. These habitats are sensitive because of their ecosystem functions – providing specialised niches for fauna, creating corridors in the landscape, filtering water, catching sedimentation and concentrating water runoff from catchments.

4.8. Social Characteristics of the Study Area and Surrounds

4.8.1. Administrative and Regional Background

The proposed Prieska Solar Energy Facility is located in the Siyathemba Local Municipality (SLM) (which is one of eight local municipalities which make up the PKSDM (NCDC7), and is located in the south-east of the Northern Cape Province. The other seven local municipalities are Emthanjeni, Kareeberg, Thembelihle, Siyancuma, Renosterberg, Ubuntu and Umsobomvu.

The PKSDM and SLM are located in the vast, arid (<250 mm/a), sparsely populated Karoo region of inland South Africa. Both the PkSDM and SLM are traversed (east to west) by the Gariep (Orange) river, the country's largest river. The majority of towns and settlements in the area are located along the Gariep. The river also supports significant irrigation agriculture (~75% of the SLM's

agricultural GDP). Two of the three largest dams in Southern Africa are located on the Gariep inside the PKSDM area.

As in other parts of the Karoo, the trend in the PKSDM and SLM has been towards the progressive concentration of the population in towns and settlements. This is linked to labour/ tenure shedding on commercial farms and increasing diversification into game farming (mainly for hunting) - which provides fewer employment (and tenure) opportunities. However, opportunities in agri-tourism and eco-tourism have created scope for new and more sophisticated types of employment (UOFS; 2007).

4.8.2. Siyathemba Local Municipality

The main settlements in the Siyathemba Local Municipality are the towns of Prieska, Marydale, Niekerkshoop, Draghoender and Copperton. The town of Prieska, which is the administrative seat of the SLM, is located on the southern bank of the Gariep, approximately 30 km south-west of the proposed Solar Energy Facility site. Prieska is by far the largest town in the SLM, and functions as the leader town in the SLM. The town promotes itself as “the gem of the Northern Cape”, based on its setting at the foot of the Doringberg, within the Gariep valley, and surrounded by large scale irrigation agriculture operations along the Gariep (SLM IDP 2010/2011).

As in the PKSDM, key activities in the SLM are related to primary sector activities, mainly agriculture and mining. Little local beneficiation takes place. Tourism and game farming (mainly for hunting) are significant emerging land uses.

Agricultural activity is by far the spatially most dominant land use in the SLM. While extensive stock farming accounts for ~98.7% of agricultural land use, it accounts for ~75% of the SLM’ agricultural GDP. At least 12 major crop types are extensively cultivated in the Gariep valley (mainly east of Prieska), the most important of which are maize and wheat, peanuts, lucerne (alfalfa) and table grapes. Stock farming operations are mainly based on small stock (sheep, goats) on spatially extensive commercial farms. Both wool and carcasses are produced. Game farming (hunting) is emerging as a key diversification strategy (UOFS; 2007 and SLM IDP 2010/ 2011 Revision).

The mining sector historically played a major role in the local economy, with asbestos and copper/ silver (Copperton) mining the key activities. Currently, mining activities are mainly related to alluvial diamond mining activities along the Gariep River. The closure of asbestos mines (mainly to the north of Prieska) as well as the Copperton mine around the early 1990’s has had a major lasting negative impact on the SLM economy.

The SLM tourism industry is in a fledgling stage, and largely based around the Gariep valley, and specifically the town of Prieska. A number of guest accommodation facilities are located in or near (<20 km) Prieksa – 13 according to the 2010/ 2010 SLM IDP. Tourism development (mainly focusing on Die Bos resort in Prieska, agro-tourism and game farming) is currently promoted as a key diversification strategy. Other established attractions in the SLM include its succulent/ xerophytic vegetation, interesting geology and semi-precious gemstones, sites of historical interest, and the "Karoo experience" – the sense of wilderness and desolation cherished by many South Africans and visitors alike. The R357 (Van Wyksvlei – Prieska, via Copperton) has been proposes as a scenic drive with touristic potential in the 2006 PKSDM SDF.

4.8.3. Demographic Profile

The total population of the PKSDM is ~ 165 000 (Census 2001). Of the total population Coloureds make up ~ 62% of the total, followed by Black Africans (~27%) and Whites (~10%). For the SLM the figures are ~ 64 % Coloured, 26 % Black African and 8 % Whites. The Siyathemba Local Municipality makes up ~ 22 % (36 000) of the total making it the most populated LM in the DM. The demographic makeup of the SLM is similar to that of the region. The population density for the region is 2.1 people per square kilometre. The age structure of the PkSDM population is similar to that of the Northern Cape Province, with ~ 16% of the population between 0-6 years old, while 8% are 60 years old or older. A further 31% are in the school going age group of 7 to 19 years. The economically active age group of 20 to 59 years old accounts for almost half the population (46%). The implications of this population structure are a higher demand on the provision of social and physical facilities, like schools, primary health care centres, etc. in the district (PKSDM IDP 2008/2009).

Employment

According to the Census 2001 data, the unemployment rate in the PKSDM was 21% and SLM had a rate of 14%. In terms of employment the agricultural sector was the most important economic sector in the PKSDM accounting for ~ 39 % of the total working population. The commercial services sector accounted for ~ 23 % of the employment opportunities. These two sectors combined therefore accounted for ~ 62 % of all the employment opportunities in the area. Although the PkSDM only had an official unemployment rate of ~ 21%, household income levels in the region are low. In this regard ~ 64% of households had an income of R1 000 or less per month compared to the Northern Cape average of 54% of households below this level. The figure for the SLM is ~ 69% (PKSDM IDP 2008/2009).

4.8.4. Education levels

The education levels in the region are low and can be attributed to the rural nature of the area together with the substantial number of previously disadvantaged population groups who did not have equal access to education in the past era. Based on Census 2001 data, ~ 25 % of the PkSDM population had no education, while 35% only had primary level of qualifications. Of the total population only 5.0 % had gained a matric qualification and 2.6% had a degree. The figures are essential the same for the SLM, namely 26% and 35% respectively. On the other hand, according to the Municipal Profiles of 2002, the primary school population represented 46.3 % of the total population of the district. There are 49 primary schools and 18 secondary schools and combined schools in the district. While the actual number of schools is generally satisfactory there is an acute shortage of schools in the remote areas of the district. As a result children often have to walk long distances to reach schools (PKSDM IDP 2008/2009).

4.8 Heritage

The area proposed for the development of the Prieska Solar Energy Facility is located in an underdeveloped rural area east of the town of Prieska.

4.8.1. Palaeontology

Beneath the superficial sediment cover, Permo-Carboniferous glacial sediments of **Dwyka Group** (C-Pd, **Karoo Supergroup)** underlie almost the entire Klipgats Pan study area. Dwyka rocks may therefore be intersected by deeper excavations during development. The Dwyka Group along the north-western margin of the Main Karoo Basin, including the Prieska Subbasin in particular, has been reviewed by Visser (1982, 1985). In Dwyka times the Prieska – Copperton area lay within a basement high region between the Sout River Valley in the west and the Prieska Basin in the east. This area is referred to as the Kaiing Hills or Kaiing Veld Region by Visser and is characterized by a relatively thin Dwyka succession (normally < 50m). This mainly comprises massive clast-rich diamictites and clast–poor argillaceous diamictites (“boulder shale”) overlain by a thin zone of laminated dropstone argillite with outsized clasts composed mainly of quartzite and gneiss . Note the presence of an isolated peak (monadnock) of Proterozoic basement rocks emerging through the Dwyka cover rocks to the southeast of Copperton (ibid.). Ice transport directions initially towards the south and later towards the southwest are reconstructed by Visser. The source area of many of the exotic boulder erratics (e.g. stromatolitic carbonates of Griqualand West succession, amygdaloidal lavas of the Ventersdorp Supergroup) seen in the Dwyka succession near Copperton, as well as the Prieska Basin to the east, is the elevated Ghaap Plateau to the north of Prieska (Visser 1982).

Further detailed observations on the Dwyka beds on the northern edge of the Britstown 1: 250 000 sheet are provided by Prinsloo (1989). Good surface outcrops of the Dwyka beds are rare here due to extensive cover by thin surface gravels. Massive tillites at the base of the Dwyka succession were deposited by dry-based ice sheets in deeper basement valleys. Later climatic amelioration led to melting, marine transgression and the retreat of the ice sheets onto the continental highlands in the north. The valleys were then occupied by marine inlets within which drifting glaciers deposited dropstones onto the muddy sea bed ("boulder shales"). The upper Dwyka beds are typically heterolithic, with shales, siltstones and fine-grained sandstones of deltaic and / or turbiditic origin. These upper successions are typically upwards-coarsening and show extensive soft-sediment deformation (loading and slumping). Varved (rhythmically laminated) mudrocks with gritty to fine gravely dropstones indicate the onset of highly seasonal climates, with warmer intervals leading occasionally even to limestone precipitation (Almond J.E. 2012).

4.8.2. Stone Age

Stone Age sites in the demarcated study area and surrounds is not well known or described. Some open-air sites have been identified, however, despite significant research in the area, very few Stone Age sites have been identified this far west in the Northern Cape. Some Middle Stone Age sites containing flakes and cores are found in open areas while Late Stone Age sites are found in more sheltered sites within river valleys and hills.

4.8.3. Rock Art

Some Khoisan associated rock art sites are found on farms around the town of Prieska.

4.8.4. Iron Age

No Iron Age sites are known from this area.

4.8.5. The Historic Era

Although there is no consensus as to the actual spelling of the original name of this Northern Cape town, varying from Priskab to Prieschap, its meaning is unequivocally "The place of the lost she-goat". According to the *SA Pleknaamwoordeboek Deel 1*, in Korana *beris* means she-goat while *ga* is dead or lost.

Like most towns along the Orange River, Prieska was a ford across the river long before white settlers arrived. Only in 1878 was it proclaimed a municipality and gained status as a full-fledged town.

Situated on the south bank of the Orange River at the foot of the Doringberg and at the time not much more than a church and a collection of townhouses for the farmers of the district, Prieska played a minor role in the Anglo Boer War. In 1900 the little-known revolt by the Cape Afrikaners took place in and around Prieska and some skirmishes with the British troops resulted. The rebellion lasted until early April and spread throughout the north-western Cape, until a British force under Lord Kitchener's supervision dispersed most of the Boers and their Cape sympathisers. They retreated to Transvaal.

Utilising the region's tiger's eye stones, the British built a fort on top of the Prieska Kopje overlooking the town. This is still a major tourist feature. The graves of British soldiers who died in the war are maintained in the Memorial Garden.

4.8.6. Built Environment

Most of the study area falls within an undeveloped rural landscape with little or no built structures. The only built structures expected to be encountered in this area would be farm homesteads and their associated infrastructures.

Several skirmish sites related to the South African War is also found in the area and it is expected that indications of these, such as spent cartridges, tin cans etc. could be expected in the study area.

SCOPING OF ISSUES ASSOCIATED WITH THE PROPOSED PRIESKA SOLAR ENERGY FACILITY 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.

Environmental issues associated with **construction and decommissioning** activities of a PV solar energy facility are similar and include, among others:

» Impact on fauna, flora and ecology.
» Impact on land use - inability to use arable land during construction of the facility.
» Impact on soils and geology in terms of increase in erosion potential.
» Potential Impact on heritage resources.
» Social impacts (positive and negative).

Environmental issues specific to the **operation** of a PV solar energy facility could include, among others:

» Habitat transformation (limited to the footprint of the PV panels, access roads and associated infrastructure).
» Change in land-use and loss of arable land for the footprint of the facility.
» Potential soil loss for the footprint of the facility.
» Visual impacts (intrusion, negative viewer perceptions and visibility of the facility)
» Social impacts (positive and negative)

Table 5.1 and Table 5.2 provide a summary of the findings of the scoping study undertaken for the construction and operation phases of the proposed project respectively. These potential impacts are relevant to Prieska Solar Energy Facility project. Impacts of the proposed facility are evaluated, and recommendations are made regarding further studies required within the EIA phase of the process.

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 the scoping phase at a **desktop level** based on existing information:

» Identify **potential sensitive environments** and **receptors** that may be impacted on by the proposed facility and the **types of impacts** (i.e. direct, indirect and cumulative[3]) 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. Tables 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).

5.2 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 invertors, on-site substation and associated infrastructure (i.e. internal access roads and buildings). 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.

[3] 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.

Table 5.1: Evaluation of potential impacts associated with the Construction Phase

Issue	Nature of Impact during Construction	Extent of Impact	No-Go Areas
» **Flora:** The Northern Upper Karoo is described as a shrubland dominated by dwarf karoo shrubs and grasses. On deeper soils, higher shrubs of *Acacia mellifera* subsp. *detinens* and *Rhigozum trichotomum* can become invasive, forming dense stands where the grass and low shrub layer has been significantly weakened. Other prominent taller shrubs and trees include *Boscia albitrunca* (nationally protected) and several *Lycium* species. The dwarf shrub layer is mostly dominated by *Chrysocoma ciliata*, *Pentzia* species, *Eriocephalus* species, *Salsola* species, and *Zygophyllum* species. Prominent grasses are of the genera *Aristida, Eragrostis, Enneapogon,* and *Stipagrostis* (Mucina and Rutherford 2006). This vegetation type is regarded as least threatened, even though none of it is officially protected, with only about 4% transformed by cultivation or infrastructure. Erosion throughout the range of this vegetation type ranges from very low to moderate (Mucina and Rutherford 2006). Several areas of this vegetation type are infested with alien Prosopis species, especially along drainage lines. The potential red data plant species that may occur on the site include: * Succulents - *Hoodia gordonii* and *Lithops lesliei subsp. burchellii* * Geophytes - *Crinum bulbispermum* and *Disa draconis* * Low Shrub - *Erica aspalathifolia var. aspalathifolia* It is unlikely that the development will compromise the survival of any of the species of conservation concern once the final layout has been designed in accordance to findings of a field investigation. Plant species of conservation concern will only be identifiable during the growing season. » **Fauna and Avifauna:** Bird and mammal species of conservation concern (red-listed) are mostly restricted to birds and small mammals. There are a number of vulnerable and one endangered species that could occur in the study area, but they are no threatened, near threatened or protected species that occur in available habitats in the proposed study area although this will be confirmed in the EIA phase. The following red data bird species may utilised habitat on the site: * Blue Crane * Tawny Eagle * Kori Bustard * Black Stork * Saddlebill Stork			

Issue	Nature of Impact during Construction	Extent of Impact	No-Go Areas

* Cape Vulture
* Ludwig's Bustard
* Sclater's Golden Mole
* Spectacled Dormouse
* Black-footed Cat
* African Wild Cat
* Honey Badger
* Aardwolf
* Antbear / Aardvark
* Pangolin

* The following red data fauna may occur on the site:
* Sclater's Golden Mole
* Spectacled Dormouse
* Black-footed Cat
* African Wild Cat
* Honey Badger
* Aardwolf
* Antbear / Aardvark
* Pangolin

» **Drainage Lines:**

There are no major rivers on the site itself, however drainage is channelled through several tributaries / drainage lines of variable slope and size to ultimately link up to the Orange River beyond the study area. Drainage areas and dams that could be remotely identified on the site and are shown in Figure 5.1. Within these drainage lines, few small dams have been created for agricultural purposes, but with the generally very low rainfall of the area, are often dry. According to the National Water Act, the drainage lines (most likely non-perennial) which traverse the site, are classified as wetlands or water resources.

Potentially ecological sensitive areas were identified from visual inspection of Google imagery and past experience and are shown in Figure 5.1. The areas thus identified as potentially sensitive (Figure 2) are drainage areas and dams that could be remotely identified. These habitats are sensitive

Issue	Nature of Impact during Construction	Extent of Impact	No-Go Areas
because of their ecosystem functions – providing specialised niches for fauna, creating corridors in the landscape, filtering water, catching sedimentation and concentrating water runoff from catchments. The sensitivity analysis provided is thus only a preliminary assessment that will be updated after a field visit, which can only take place once the majority of plant species in the area are actively growing.			
Disturbance or loss of indigenous natural vegetation	Construction of infrastructure may lead to direct loss of vegetation, causing a localised or more extensive reduction in the overall extent of vegetation. Consequences of the potential impact of loss of indigenous natural vegetation occurring may include: » Increased vulnerability of remaining portions to future disturbance; » General loss of habitat for sensitive species; » Loss in variation within sensitive habitats due to loss of portions of it; » General reduction in biodiversity; » Increased fragmentation (depending on location of impact); » Disturbance to processes maintaining biodiversity and ecosystem goods and services; and » Loss of ecosystem goods and services.	Local	No “no-go” areas have been identified at this stage; areas of potential sensitivity are shown in Figure 5.1 for further investigation in the EIA phase.
Disturbance or loss of threatened / protected plants	Several red-data plant species could potentially occur on the site. Flora is affected by overall loss of habitat and is 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, possibly extinction. This may arise if the proposed infrastructure is located where it will impact on such individuals or populations. Consequences of this may include: » Fragmentation of populations of affected species » Reduction in area of occupancy of affected species » Loss of genetic variation within affected species These may all lead to a negative change in conservation status of the affected species, which implies a reduction in the chance of survival of the species.	Local	None identified at this stage, requires further investigation in the EIA phase.
Loss of protected trees	According to the National Forests Act, no person may cut, disturb, damage or	Local	Location and occurrence

Issue	Nature of Impact during Construction	Extent of Impact	No-Go Areas
	destroy any listed protected tree species. Any of these protected species could occur in any part of the study area, depending on local conditions. A permit is required from the Department of Agriculture, Forestry and Fisheries (DAFF) before any protected trees may be impacted.		of protected trees to be confirmed during the EIA Phase.
Loss of habitat for threatened and protected animals and birds	Threatened animal species are 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. Animals are generally mobile and, in most cases, can move away from a potential threat. Threatened species include those classified as critically endangered, endangered, or vulnerable. For any other species a loss of individuals or localised populations is unlikely to lead to a change in the conservation status of the species. However, 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. Consequences may include: » Fragmentation of populations of affected species; » Reduction in area of occupancy of affected species; and » Loss of genetic variation within affected species. 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. There are a number of vulnerable and one endangered species that could occur in the study area, but they are no threatened, near threatened or protected species that occur in available habitats in the proposed study area although this will be confirmed in the EIA phase.	Local	No “no-go” areas have been identified at this stage; areas of potential sensitivity are shown in Figure 5.1 for further investigation in the EIA phase.
Impacts on	The site is in a semi-arid area. There are several small drainage lines traversing the	Local	No “no-go” areas have

Issue	Nature of Impact during Construction	Extent of Impact	No-Go Areas
watercourses and drainage areas	study area. According to the National Water Act, these are classified as wetlands or water resources. Construction, if it occurred within any of these areas, would 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 affect the hydrology of the landscape or lead to loss of habitat for species that depend on this habitat type.		been identified at this stage; however, some drainage areas do occur on the site as shown in Figure 5.1, to be further investigated in the EIA phase.
Establishment and spread of declared weeds and alien invader plants.	Major factors contributing to invasion by alien invader plants includes *inter alia* high disturbance (such as clearing for construction activities) and negative grazing practices. Exotic species are often more prominent near infrastructural disturbances than further away. Consequences of this may include: » 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; and » Impairment of wetland function. The extent to which the site contains alien plants will be determined in the EIA phase.	Local	None identified at this stage.
Gaps in knowledge & recommendations for further study The potential impacts on ecology will be assessed in greater detail during the EIA phase of the project. It is recommended that:			

Issue	Nature of Impact during Construction	Extent of Impact	No-Go Areas
» The initial desk-top investigation of the study area indicates that placement of components of the solar energy facility will have to be aligned mostly according to existing wetlands on the ground Several protected and red-data species potentially occur on the site. However, it is unlikely that the development, once the final layout has been designed in accordance to findings of a field investigation, will compromise the survival of any of the species of conservation concern. » Plant species of conservation concern will only be identifiable during the growing season and a field survey. » It must be noted that this area has not been extensively collected, thus species that have not been captured in the POSA SANBI species database for the area up to date, may in fact be found within the study area. » A detailed ecological survey and sensitivity assessment will be undertaken during the EIA phase according to the methods contained in the Plan of Study (Chapter 7)			

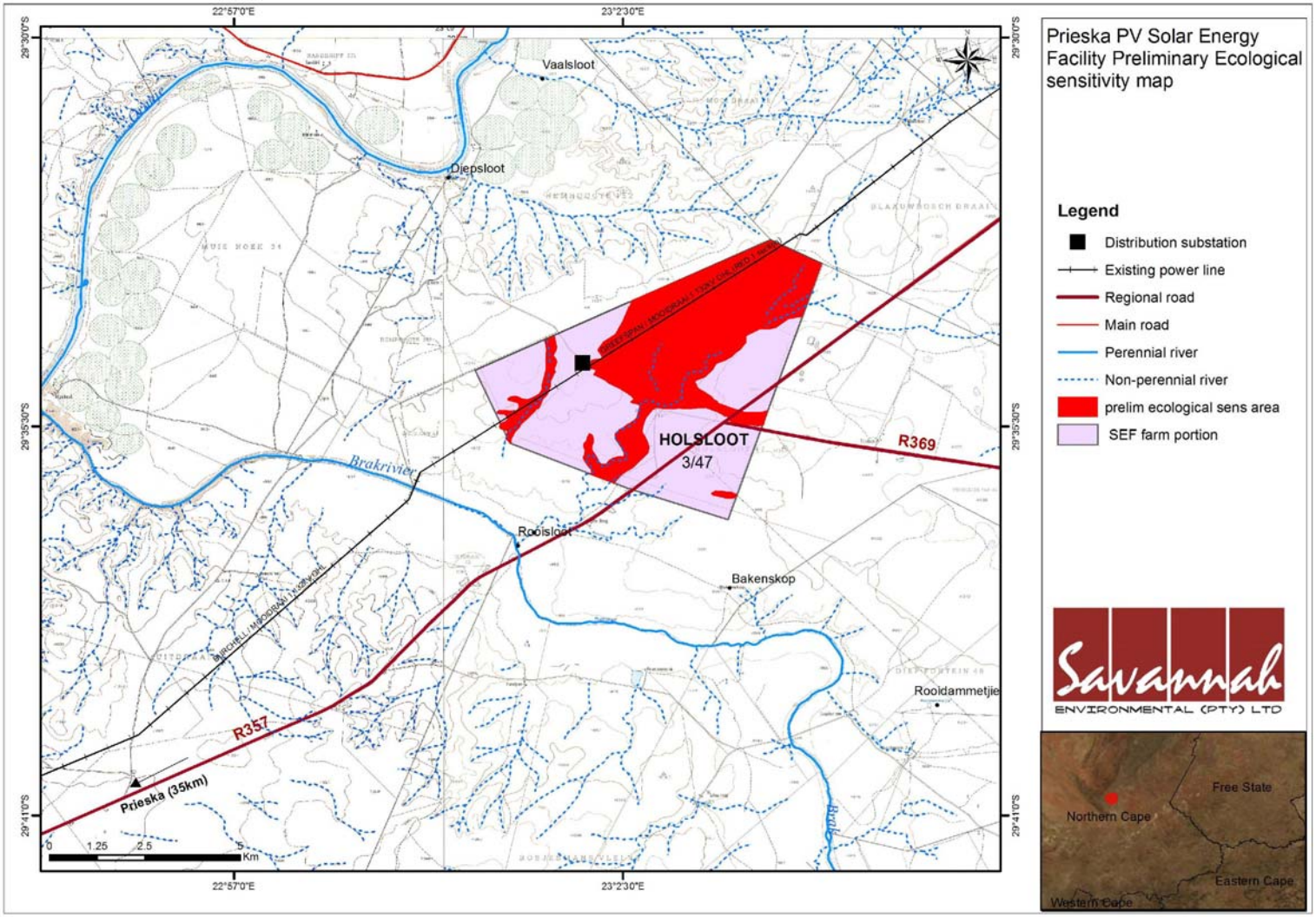


Figure 5.1: Preliminary Ecological sensitivity map of the Prieska site.

Impacts on Soils

The soil types present on the site are as follows:

» **Land Type Ag136:** Ag land types denote areas where there are red-yellow apedal soils which are freely drained. This type of soil has a high base status with an effective depth of less than 300mm deep on average.
» **Land Type Ae301**: Ae land types denote an area that has red-yellow apedal soils that is freely drained with a high base status and with an effective depth of more than 300mm deep on average.
» **Land Type Fc567:** Fc group of land types has Glenrosa and/or Mispah soil forms (other soils may occur), with an effective depth of less than 300mm deep on average.

Majority of the site (70%) is covered by the Ag136 landtype. The site is flat to gently sloping, with 70% of the slopes less than 2% and 30% between 3% and 5%. There are no slopes in access of 20% on the site.

The site has a low to moderate susceptibility to water and wind erosion acrroding to the GIS information from the Department of Agriculture, Fisheries & Forestry –(www.agis.agric.za). This is shown **in Figure 5.2**. There may be soils on the site with a high erodibility, but in general the predicted soil loss of the site is categorised as low. It is therefore expected that the site will generally be low to moderately susceptible to erosion, a fact which will need to be studied and confirmed during the EIA phase.

Impacts relate to physical soil disturbance or soil contamination due to construction activities. Direct impacts are associated with the soils along the constructed roads as well as on the PV panel construction sites. Indirect impacts could arise in the form of soil erosion and degradation if storm water management is not planned and managed properly as it is generated on the roads and construction sites. Soil contamination could occur due to the use of oils, lubricants, concrete and other chemicals during construction. Cumulative impacts are only considered to be problematic if the aforementioned storm water management is not instituted. Otherwise very limited cumulative impacts are expected due to the level terrain and relatively shallow nature of the soils. The extent of this impact will be local in terms of the activity and will be associated with the activity only. Slightly larger, but still local in extent, impacts are expected if storm water runoff is not controlled.

Issue	Nature of Impact	Extent of Impact	No Go Areas
Soil degradation due to excavation	Damage of soil and associated ecosystems due to excavations arising from construction activity.	Local	None identified at this stage
Soil pollution	Damage of soil and associated ecosystems due to spillage of hazardous chemicals such as	Local	None identified

	fuel on construction sites.		at this stage
Soil degradation due to erosion (water or wind)	Loss of soil and damage to associated ecosystems due to erosion of soil in areas of activity.	Local	None identified at this stage
Soil degradation due to siltation downstream/ downwind	Damage of soil and associated ecosystems due to siltation arising from accelerated erosion associated with construction activities	Local	None identified at this stage

Gaps in knowledge & recommendations for further study

The potentially significant impacts on soils will be assessed in the EIA phase will be limited to the classification of the soils as well as assessment of slopes and storm water impacts. These parameters will provide an indication to the project engineers regarding the erosion risk as well as inform the mitigation measures to be implemented on the site. The following will be undertaken in the EIA phase:

» A detailed site visit will have to be conducted as part of the EIA level investigation and the following parameters should be investigated:
» Soil distribution (classification) on the site;
» 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.

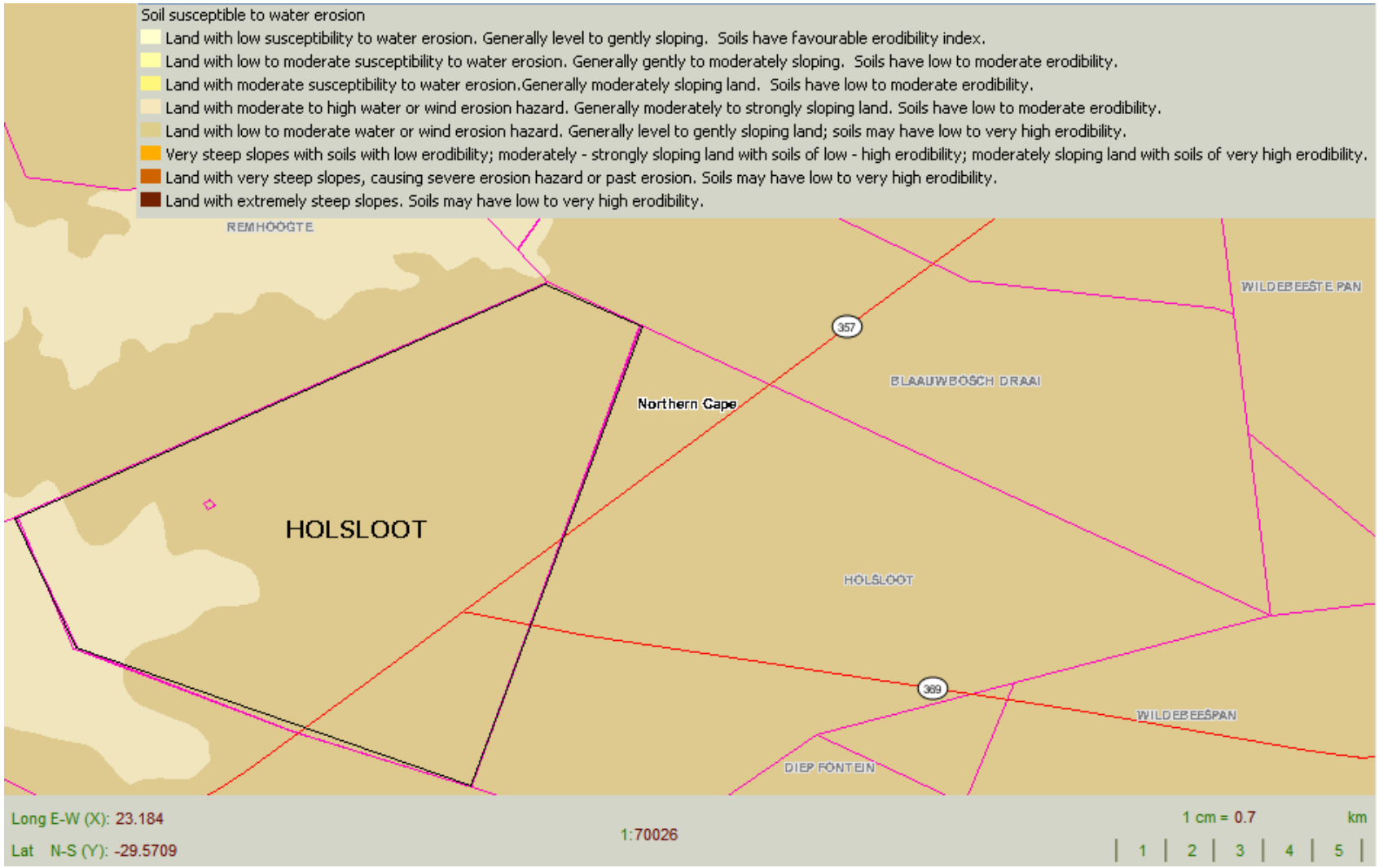


Figure 5.2: Soil eroilbilty map for the Prieksa site

Impacts on Current Land Use and Agricultural Potential Due To Construction Activities

The site falls into the Ag136, Ae301, Fc567 and Fc568 land types, which is classified as being of low agricultural potential. There are no cultivated lands visible on the Google Earth Image of the site, which will be verified during the EIA process. There are no agricultural important infrastructure (i.e. silos, irrigation lines, pivot points, channels and feeding structures, etc.) or any conservation works (i.e. contour banks, waterways, etc.), that will be interfered with, visible on the 1:50,000 topographical maps or Google Earth Images of the site. In the long term, the farm portion will be leased by the developer, and the current landowner will continue to determine what land use to permit on the site. Agricultural activities (i.e. grazing) on the site may be continued during the operation of the facility, and therefore there will be a limited (on the site itself) loss of low agricultural potential land. However, with the low prevailing agricultural potential on majority of the site, this impact would in all probability be of limited significance and would be local in extent. At the end of the project life, it is anticipated that removal of the structures would enable the land to be rehabilitated and used for a suitable land-use / activity.

Issue	Nature of Impact	Extent of Impact
Temporary disturbance to grazing land-use of the farm during construction.	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

The potential impacts on soils will be assessed in greater detail during the EIA phase of the project.

It is recommended that:

» The agricultural potential of the site is considered low and the proposed activity will not have any significant effect on this status. Due to low agricultural potential of the soils and the prevailing climatic limitations for agriculture, impacts are expected to be of low significance.

» It is unlikely that there are any cultivated areas on the site; however this will be confirmed during the EIA phase.

Heritage Impacts

Heritage resources include:

» Archaeological artefacts, structures and sites older than 100 years
» Ethnographic art objects (e.g. prehistoric rock art) and ethnography
» Objects of decorative and visual arts
» Military objects, structures and sites older than 75 years
» Historical objects, structures and sites older than 60 years
» Proclaimed heritage sites
» Grave yards and graves older than 60 years
» Meteorites and fossils
» Objects, structures and sites or scientific or technological value.
» Places, buildings, structures and equipment of cultural significance
» Places to which oral traditions are attached or which are associated with living heritage
» Historical settlements and townscapes
» Landscapes and features of cultural significance
» Geological sites of scientific or cultural importance
» Archaeological and palaeontological importance
» Graves and burial grounds
» Sites of significance relating to the history of slavery
» Movable objects (e.g. archaeological, palaeontological, meteorites, geological specimens, military, ethnographic, books etc.)

The heritage scoping report relies on the analysis of written documents, maps, aerial photographs and other archival sources. Site investigations were not performed as this will be done during the EIA phase of the project. The heritage scoping study indicates that the area proposed for the development of the Prieska Solar Energy Facility is located in an underdeveloped rural area east of the town of Prieska. Based on the Heritage Impact Scoping Report an indication was made that there is nearly no chance of encountering sites of Iron Age origin or sites within the Built Environment components. More likely will be the occurrence of sites within the Stone Age and Palaeontological as well as the Historic spheres. However, the study area will be subjected to a full EIA phase heritage investigation including a palaeontological impact assessment. Specific areas likely to hold sites of Stone Age origin (including rock art) will be the edge of waterways, water confluences and elevated areas with rock faces that could contain rock shelter sites.

Previous studies around the Prieska areas found the possible occurrence of important Stone Age as well as palaeontological finds. Some Khoisan associated rock art sites are found on farms around the town of Prieska. No Iron Age sites are known from this area. The British built a fort on top of the Prieska Kopje overlooking the town. This is still a major tourist feature. The graves of British soldiers who died in the war are maintained in the Memorial Garden.

Most of the study area falls within an undeveloped rural landscape with little or no built structures. The only built structures expected to be encountered in this area would be farm homesteads and their associated infrastructures. It is not anticipated that any of these structures would be affected by the proposed development. Should the developer decide to utilise any of the existing structures for their operations and this entails alterations to the buildings it is recommended that they subject these to further study before such actions.

Construction activities such as clearing of land for the PV facility, shallow excavations for the PV panel mountings, substation and invertors and well developing access roads could lead to loss or damage to heritage resources. Based on the current information obtained for the area at a desktop level it is anticipated that any sites that occur within the proposed development area will have Generally Protected Significance, where mitigation is required prior to destruction of such heritage sites/ artifacts.

Issue	Nature of Impact	Extent of Impact
Potential loss or destruction of heritage artefacts - archaeological and paleontological finds.	Area impacts are possible in the case of proposed substation site and developmental footprints for the establishment of the PV panels.	Local

Gaps in knowledge & recommendations for further study

The study area was not subjected to a field survey as this will be done in the EIA phase. It is assumed that information obtained for the wider area is applicable to the study area.

Recommendations:

During the EIA phase of the project it is suggested that in order to comply with the National Heritage Resources Act (Act No 25 of 1999) a Phase 1 Archaeological Impact Assessment must be undertaken. The following will form part of this study:

» Sites of archaeological, historical or places of cultural interest will be located, identified, recorded, photographed and described.
» The levels of significance of recorded heritage resources will be determined and mitigation proposed should any significant sites be impacted upon, ensuring that all the requirements of SAHRA are met.
» A desktop Paleontological Impact Assessment will also be conducted.

Visual Impacts

The site location can be described as remote due to its considerable distance from any major metropolitan centres or populated areas. The study area is sparsely populated (approximately 1.4 persons per km^2), with the highest concentration of people living in towns such as Prieska. There are homesteads and settlements present within the study area. These include *Rooisloot, Taaibos, Ratelpan, Annexdraai, Diepfontein, Diepfontein 2, Rooidam, Johnsonspan* and *Herbou*, which all occur within a 16km radius of the proposed facility.

Construction related activities which could impact on the overall visual aesthetics of the study site include construction of access roads and foundations, and establishment of the power line as well as temporary scarring of the landscape.

Issue	Nature of Impact	Extent of Impact
Temporary visual intrusions / disturbances to people during construction.	The potential visual impact of the construction of ancillary infrastructure (i.e. the substation and internal access roads) on observers residing in close proximity of the facility.	Local

Gaps in knowledge & recommendations for further study:

» Visual impacts during the construction phase are expected to be limited to the site and of short duration. These impacts are therefore not expected to be of significance and will not require detailed assessment in the EIA phase.

Impacts on the Social Environment

The main negative impacts are associated with the intrusion impacts associated with the construction phase. The most important potential social benefits associated with the construction of the project refer to the job opportunities and possible socio-economic spin-offs created, even of a very limited scale.

Potential social impacts during construction include:

» Job creation (positive impact) – limited opportunities
» Economic spin-offs to local community (positive impact)
» Safety and security risks to farmer's property and livestock (negative impact) due to influx of job seekers to the area
» Construction traffic (negative impact) and disturbances.

These impacts are discussed below.

Issue	Nature of Impact	Extent of Impact
Temporary job creation during construction phase.	Limited employment opportunities would be available during the construction phase. Even though the area has a low population density and education levels are low, it is still anticipated that there would be sufficient unemployed individuals that could be sourced as labourers for the unskilled to semi-skilled work required. Skilled positions would probably be filled by outsiders. If other applications for similar projects in the same area are approved and if the construction periods overlap it could have some impact on the availability of skills.	Local - Regional
Economic spin-offs to local community.	Due to construction activities, the small workforce will need accomodation and supplies. Other economic spin-offs include Local procurement of general construction materials and goods (e.g. cement, sand / stone etc.).	Local
Influx of people into the study areas including members of the construction crews and job seekers.	An increase in people movement could increase the safety and 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	Potential opportunities for 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 surrounding landowners	Temporary disruptions in the daily living and movement patterns of neighbouring private 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;	Local

Gaps in knowledge & recommendations for further study

The Social Impact Assessment study will be conducted during the EIA Phase including:

» A further literature review
» Public consultation sessions and fieldwork
» An analysis of the social data collected
» Impact assessment (rating) and providing mitigation measures

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

Impacts on Fauna, Flora and Ecology

Operation related activities which could impact on the fauna, flora and overall ecology of the study site include:

» Maintenance (trimming / removal) of surrounding vegetation as part of management of the facility.
» Maintenance of the overhead power line.
» Presence of impermeable surfaces associated with the substation and workshop area.

Areas of ecological sensitivity have been identified in Figure 5.1 for further consideration in the EIA phase.

Issue	Nature of Impact	Extent of Impact	'No go' Areas
Loss of protected plant and animal species due to habitat transformation (limited to the footprint of the PV panels, access roads and associated infrastructure).	The foundation footprints of the solar panels will need to be de-vegetated (as vegetation can interfere and block the sunlight absorbed by the solar panels) and often gravel is placed beneath the panels; therefore on the actual footprint of the solar panel arrays, a permanent loss of vegetation will occur for the operational life of the facility (more than 20 years).	Local (footprint of the solar panels)	Areas of ecological sensitivity have been identified in Figure 5.1 for further consideration in the EIA phase.

Gaps in knowledge & recommendations for further study

The potential impacts on ecology will be assessed in greater detail during the EIA phase of the project.

It is recommended that:

» The initial desk-top investigation of the study area indicates that placement of components of the solar energy facility will have to be aligned mostly according to existing wetlands on the ground Several protected and red-data species potentially occur on the site. However, it is unlikely that the development, once the final layout has been designed in accordance to findings of a field investigation, will compromise the survival of any of the species of conservation concern.

- » Plant species of conservation concern will only be identifiable during the growing season and a field survey.
- » It must be noted that this area has not been extensively collected, thus species that have not been captured in the POSA SANBI species database for the area up to date, may in fact be found within the study area.
- » A detailed ecological survey and sensitivity assessment will be undertaken during the EIA phase according to the methods contained in the Plan of Study (Chapter 7)

Impacts on Agricultural Potential

The site falls into the Ag136, Ae301, Fc567 and Fc568 land types, which is classified as being of low agricultural potential. However, in the long term, the farm portion will be leased by the developer, and the current landowner will continue to determine what land use to permit on the site. Agricultural activities (i.e. grazing) on the site may be continued during the operation of the facility, and therefore there will be a limited (on the site itself) loss of low agricultural potential land. However, with the low prevailing agricultural potential on majority of the site, this impact would in all probability be of limited significance and would be local in extent. At the end of the project life, it is anticipated that removal of the structures would enable the land to be rehabilitated and used for a suitable land-use / activity.

Issue	Issue	Extent
Loss of low agricultural potential land on the site.	Loss of arable land, however, at the end of the project life, it is anticipated that removal of the structures and rehabilitation of the site would allow for a suitable land-use / activity to occur on the site.	Local

Gaps in knowledge & recommendations for further study

The on-site assessments will be done during the EIA phase to verify the agricultural assessment done during the scoping phase and this will include the following:

- » Land capability, current land-use and degradation status of the agricultural resources (i.e. soil and vegetation).
- » Geology and soils with special reference to sensitivity to erosion and factors contributing to erosion (i.e. slopes, etc.
- » Climate
- » Determine if any agricultural sensitive areas with high agricultural value (i.e. lands, wetlands and watercourses) and agricultural infrastructure (i.e. silos, irrigation lines, pivot points, channels, feeding structures, etc) occurs on the site. It is unlikely that there are any cultivated areas on the site; however this will be confirmed during the EIA phase.

Impacts on Soils

During the operation of the solar energy facility, exposed areas (areas were vegetation has been removed such as ground below the PV panels and substation / power line footprint) could be susceptible to wind/water erosion in the absence of soil erosion control measures. Soil contamination is possible, however marginal due to limited / no use of oils, diesel or fuels as maintenance PV panels require little in the way of maintenance (if pollen, dirt, dust, leaves, and other debris collect on the panels, it can be removed by spraying of water on the panels).

Issue	Nature of Impact	Extent of Impact
Soil erosion and contamination due to maintenance of the solar energy facility.	Accelerated loss of sediment cover through rainfall or artificially concentrated run-off may occur. During maintenance of the solar panels and associated infrastructure any chemicals used have the potential to contaminate the soil.	Local

Gaps in knowledge & recommendations for further study

The following activities will be undertaken as part of the Soil assessment in the EIA Phase:

» A detailed site visit will have to be conducted as part of the EIA level investigation and the following parameters should be investigated:
» Soil distribution (classification) on the site;
» 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.

Visual Impacts

A desktop scoping visual study was undertaken using Geographic Information Systems (GIS) software as a tool to generate viewshed analyses and to apply relevant spatial criteria to the proposed solar energy facility. I t is expected, from a visual impact perspective, that the solar panels would constitute the highest potential visual impact of the solar energy facility, therefore, the viewshed analysis for the facility was undertaken from a number of provisional positions at an offset of 3m above average ground level (i.e. the approximate maximum height of the proposed PV panels).

The proposed facility will have a core area of potential visual exposure on the project site itself, and within an area extending about 3km to the north and west, 10km to the east and some 15km to the south. The hilly topography to the immediate north west of the site, and the incised river valley beyond, result in a significant visually screened area to the north west of the site. Overall, the zone of potential visual exposure therefore extends mainly to the south east (i.e. up to a distance of more than 16km). Further afield, an area of potential visual exposure lies in the far north west of the study area and to a lesser extent to the far south west. Potentially sensitive visual receptors within this visually exposed zone include users of the main and secondary roads, especially to the north east, east and south west, and residents of agricultural homesteads and settlements. These include *Rooisloot, Taaibos, Ratelpan, Annexdraai, Diepfontein, Diepfontein 2, Rooidam, Johnsonspan* and *Herbou*, which all occur within a 16km radius of the proposed facility. The town of Prieska lies 30km from the proposed site, and will not be visually exposed to the proposed facility.

Potential negative visual impacts include:

» Change of the visual character of the site and if this could affect the sense of place of the region.
» The visibility of ancillary infrastructure (i.e. power line, administrative building, internal access roads and workshop) on people who live in close proximity to the site.
» Light pollution due to operational, safety and security lighting of the facility at night.

The result of the preliminary viewshed analysis for the proposed solar energy facility is shown in **Figure 5.4**. This was done in order to determine the general visual exposure of the area under investigation, simulating the proposed structures associated with the solar energy facility. It must be noted that the viewshed analysis does not include the effect of vegetation cover or existing structures on the exposure of the proposed solar energy facility therefore signifying a worst-case scenario. The viewshed analysis was based on a provisional zone identified for the development of the PV structures on site. Once a preliminary final layout of the solar energy facility is completed, the viewed analysis will be regenerated and refined to reflect the visual exposure of the development according to its actual position in the landscape. This will be undertaken during the EIA phase of the project.

Inputs from the public participation process should also confirm the value of the landscape in terms of visual quality.		
Issue	**Nature of Impact**	**Extent of Impact**
Visual impacts (intrusion, negative viewer perceptions and visibility of the facility).	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

Gaps in knowledge & recommendations for further study:

The following activities will be undertaken as part of the Visual Specialist Study during the EIA Phase:

» 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.

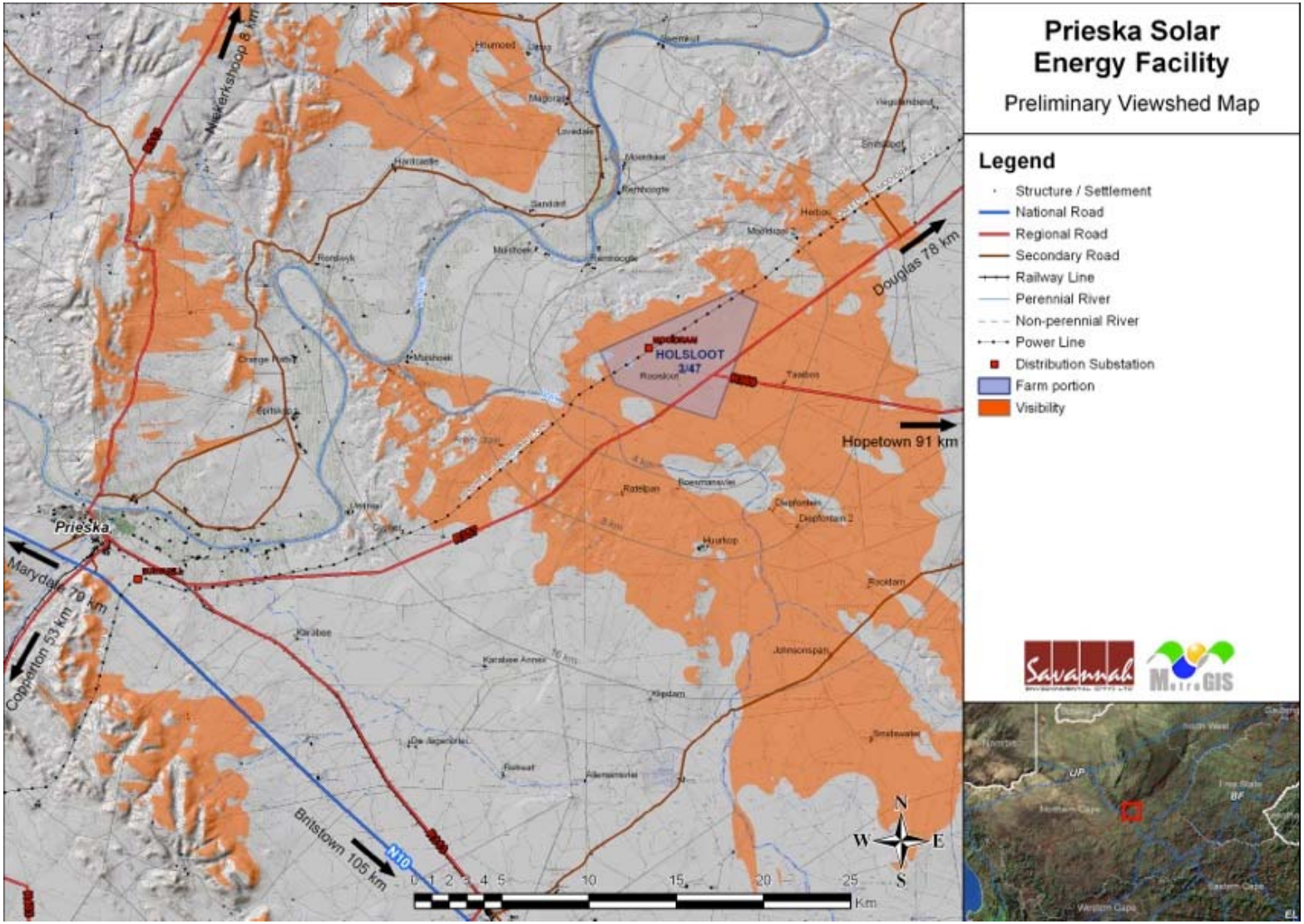


Figure 5.4: Potential visual exposure of the proposed Prieska Solar Energy Facility.

Impacts on the social environment

During the operation phase the potential exists for further, albeit limited, job creation and some skills development (positive impacts). However, there is also the potential for impacts on the social dynamics of the study area. The proposed project could assist with decreasing South Africa's dependency on coal generated electricity thereby strengthening the electricity grid in an "environmentally friendly" way. On a regional scale it could possibly result in positive changes in the quality of lives of many individuals currently living without an efficient and satisfactory electricity supply. On a national scale, the proposed project could fit in with the government's aim to develop renewable energy (including solar PV) projects in South Africa.

Issue	Nature of Impact	Extent of Impact
Employment opportunities	A PV facility usually does not require large numbers of employees during its operational lifespan and limited maintenance. The limited number of individuals to be employed during the operational phase of the project would be responsible for maintenance of the solar energy facility (e.g. cleaning of panels / security personnel). Maintenance of the local gravel roads could furthermore result in more jobs created, although possibly only on a temporary scale. The limited daily movement of workers to and from the site is thus not expected to have any marked impacts on the social environment. Capacity building and skills development throughout the life of the facility could be to the benefit of the employees and could assist them in obtaining transferable skills. During the operational phase, local procurement for general materials, goods and services (e.g. catering and security) could materialise	Local - Regional
Safety and security impacts on the site and surrounds.	The presence of the solar energy facility could prompt criminals to enter the site or surrounding properties through the site. Indirectly, possible illegal poaching of game and animals / general theft could occur. However, the facility will be fenced and the use of security measures to limit / prevent significant safety / security impacts.	Local
Contribution of clean energy.	On a national scale the project is anticipated to have positive environmental impacts through the "greener" technology that will be used (no use of fossil fuels / no noise / no emissions and so forth). The proposed project could therefore assist in meeting the government's target for renewable energy while contributing to sustainable development in the country.	National

Gaps in knowledge & recommendations for further study

The Social Impact Assessment study will be conducted during the EIA Phase including:

» A further literature review
» Public consultation sessions and fieldwork
» An analysis of the social data collected

» Impact assessment (rating) and providing mitigation measures

Table 5.3: Evaluation of potential Cumulative Impacts associated with the Solar Energy Facility

» **Approach to Cumulative Effects Assessment**

Cumulative impacts, in relation to an activity, refer to the impact of an activity that in-itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area. For cumulative effects analysis to help the decision-maker and inform interested parties, it must be limited to effects that can be evaluated meaningfully (DEAT, 2004). Boundaries must be set so analysts are not attempting to measure effects on everything. Therefore, the cumulative impacts associated with the proposed Prieska Solar Energy Facility have been viewed from two perspectives within this EIA:

I. Cumulative impacts associated with the scale of the project,

II. Cumulative impacts associated with a) other relevant wind or solar (renewable) projects that have been approved (received an Environmental Authorisation), b) projects which have been awarded preferred bidder status by the Department of Energy and are planned to be constructed in the area within the immediate term, or c) projects which are existing.

Based on the information available at the time of undertaking this EIA, there are 6 proposed projects that between Prieska and Copperton. Only one project has reached preffered bidder status namely: the Mulilo Power (Pty) Ltd, Proposed Photovoltaic Power Generation Facility near Prieska . DEA Reference No. 12/12/20/1722.

A list of the proposed projects in the area are as follows:

Project	Project Developer	Location	Status of the Project	DEA Reference No.
1. Proposed Photovoltaic Power Generation Facility near Prieska	Mulilo Power (Pty) Ltd	Farm 104/1 near the Town of Prieska	EA issued Preferred Bidder	12/12/20/1722
2. Proposed establishment of a wind farm facility in Prieska, Siyathemba Local Municipality, Northern cape	South African Mainstream Renewable Power Development	Remainder of the Farm plat Sjambok No. 102; Portion 1 & 3 of the farm Kaffirs Kolk No. 118, near Prieska	EIA complete	12/12/20/2320/1

3. Proposed establishment of a PV Solar facility in Prieska, Siyathemba Local Municipality, Northern cape	South African Mainstream Renewable Power Development	Remainder of the Farm plat Sjambok No. 102; Portion 1 & 3 of the farm Kaffirs Kolk No. 118, near Prieska	EIA in process	12/12/20/2320/2
4. Proposed Photovoltaic Energy Plant On Farm Klipgats Pan Near Copperton, Northern Cape	Mulilo Power (Pty) Ltd	Farm Klipgats Pan Near Copperton	EIA in process	12/12/20/2501
5. Proposed Wind Energy Facility Near Copperton, Northern Cape	Plan 8	Portions 4 and 7 of Farm Nelspoortje ("Struisbult")~ 50 km southwest of Prieska	Unknown	12/12/20/2099
6. Proposed Garob Wind Energy Facility Project, Northern Cape Province	Juwi	Portion 5 of Farm Nelspoortje 103 east of Copperton	EIA in process	14/12/16/3/3/2/279

Cumulative effects are commonly understood as the impacts which combine from different projects and which result in significant change, which is larger than the sum of all the impacts (DEAT, 2004). The complicating factor is that the projects that need to be considered are from past, present and reasonably foreseeable future development. Cumulative effects can be characterised according to the pathway they follow. One pathway could be the persistent additions from one process. Another pathway could be the compounding effect from one or more processes. Cumulative effects can therefore occur when impacts are:

* additive (incremental);
* interactive;
* sequential; or
* synergistic.

Canter and Sadler (1997) describe a three step process for addressing cumulative effects in an EIA:

* delineating potential sources of cumulative change (i.e. GIS to map the relevant wind energy facilities in close proximity to one another).
* identifying the pathways of possible change (direct impacts)
* indirect, non-linear or synergistic processes; and
* classification of resultant cumulative changes.

» **Potential Cumulative Impacts**

The cumulative impacts associated with the proposed solar energy facility at a site level are expected to be associated with the scale of the project, i.e. solar panels and associate infrastructure which will be located on the proposed site. The potential direct cumulative impacts associated with the project are expected to be associated predominantly with the potential visual impact, ecology and soils and social impacts. These cumulative effects can only be assessed once a preliminary layout is available, and will be considered in the detailed specialist studies to be undertaken in the EIA phase.

In addition to cumulative impacts at a site level, cumulative impacts could be associated with this proposed development and other similar developments in the area as listed above. It is important to describe the potential cumulative impacts which may be expected in order to obtain a better understanding of these impacts and the possible mitigation that may be required. The cumulative impacts associated with the proposed facility primarily refer to those impacts associated with visual (including impacts on the cultural landscape), ecological, avifaunal and social impacts, and are mainly associated with the existing projects under construction and planned facilities in the area.

Potential cumulative impacts associated with numerous solar and/ wind energy facilities within the study area are expected to be associated with:

» *Visual impacts* – The most significant impact associated with the proposed wind and solar energy facility and associated infrastructure is the visual impact on the scenic resources and cultural landscape of this region imposed by the components of the facility.
» *Ecology* – natural vegetation within the study area is largely impacted by agricultural activities, and is formally conserved only to a limited extent. Although a wind energy facility generally results in permanent disturbance a small percentage of a broader site, any impacts on natural vegetation in this area are considered significant. Therefore, numerous developments (regardless of their nature) within the study area are expected to have an impact on vegetation at a regional level. However, it must be noted that this impact can be effectively avoided through the placement of infrastructure outside of natural vegetation and sensitive habitats.
» *Avifauna* – Cumulative loss of avifauna habitat associated with development may be an issue in the area. Risk to avifauna resulting from collisions is limited to power lines and solar infrastructure, with no other wind projects proposed in the immediate surrounding area.
» *Social* – The development of numerous renewable energy facilities within the study area will have a cumulative impact on several existing issues within the area, predominately within rural settlements associated with the potential influx of workers and job seekers. With the increased population density, this may lead to a cumulative impact on housing requirements, services (i.e. water, electricity and sanitation), health issues, safety and security New informal townships are unlikely to have the required infrastructure and services,. With the existing rural settlements in the area this will have a cumulative impact on the environment and health (i.e. in terms of ablution facilities). The main social impact, however, will be in terms of visual impacts and associated impacts on sense of place.

Positive impacts - Cumulative positive impacts are, however, also anticipated should a number of similar wind energy or solar developments be

developed in the area, largely due to job creation opportunities, business opportunities for local companies, skills development and training. The development of renewable energy facilities will have a positive impact at a national and international level through the generation of "green energy" which would lessen South Africa's dependency on coal generated energy and the impact of such energy sources on the bio-physical environment. The proposed project would fit in with the government's aim to implement renewable energy projects as part of the country's energy generation mix over the next 20 years as detailed in the Integrated Resource Plan (IRP).

CONCLUSIONS CHAPTER 6

Jouren Solar (Pty) Ltd is proposing the establishment of a commercial solar electricity generating facility and associated infrastructure on Portion 3 of the Farm Holsloot 47, which lies approximately 30 km north-east of Prieska within the Siyathemba Local Municipality in the Northern Cape. The proposed activity will have a generating capacity of 75MW. Associated infrastructure includes a substation, access roads and power line to connect to the existing power line that occurs on the site. The project has been registered with the National DEA and the EIA reference number is 14/12/16/3/3/2/313.

The Draft Scoping Report for the proposed Prieska solar energy facility has been undertaken in accordance with the EIA Regulations published in Government Notice 33306 of 18 June 2010 (as amended), in terms of Section 24(5) of the National Environmental Management Act (NEMA; Act No 107 of 1998).

This Draft 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, specialist consultants, and a consultation process with key stakeholders (including 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.

The conclusions and recommendations of this Draft Scoping Report are the result of on-site inspections, desk-top evaluations of impacts identified by specialists, and the parallel process of public participation. The public consultation process is extensive and every effort is being made to include representatives of all stakeholder groupings in the study area and the Province. Recommendations regarding investigations required to be undertaken within the EIA are provided within the Plan of Study for EIA, contained within Chapter 7 of this report.

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

The extent of the broader site (3100 hectares) is larger than the space required for the facility's development footprint (permanent footprint of 200 hectares plus associated infrastructure). Therefore, the facility can be appropriately placed within the boundary of the larger site taking any identified environmental and other constraints into account.

The facility is proposed to include several arrays of photovoltaic (PV) solar panels with a generation capacity of 75 megawatts (MW) and includes the following associated infrastructure:

» Solar panels.
» On-site inverters to step up the power and a substation to facilitate the connection between the solar energy facility and the Eskom electricity grid.
» An overhead power line. Two alternatives are being considered to evacuate the electricity from the facility. Alternative 1 would be a loop-in and loop out power line to connect into the existing Burchell - Mooidraai 1 132kV power line which traverses the site. Alternative 2 will be to connect directly into the existing Eskom Mooidraai Substation within the site.
» Internal access roads.
» Workshop area for maintenance and storage.

The main issues identified through this scoping study associated with the proposed solar energy facility and associated infrastructure are summarised in Table 6.1.

Table 6.1: Summary of significance of the potential impacts associated with the proposed Prieska solar energy facility development (relevant to both development phases)

Construction / Decommissioning Impacts	**Extent**
Disturbance or loss of indigenous natural vegetation	L
Disturbance or loss of habitat for threatened / protected plants	L
Loss of protected trees	L
Impacts on watercourses and drainage areas	L
Establishment and spread of declared weeds and alien invader plants	L
Temporary disturbance to grazing land-use of the farm during construction	L
Soil loss/ erosion / degradation	L
Loss of heritage resources	L
Temporary visual intrusions / disturbances to people	L
Job creation and skills development of local people during construction (positive impact)	L-R
Economic spin-offs to local community.	L
Safety and security risks to site and surrounds	L
Temporary disruptions in the daily living and movement patterns to neighbouring landowners	L
Operational Impacts	**Extent**
Loss of protected plant and animal species due to habitat transformation on the site.	L
Loss of low agricultural potential land on the site itself	L
Soil erosion	L
Visual impacts (intrusion, negative viewer perceptions and visibility of the facility)	R
Employment opportunities	L-R
Safety and security impacts on the site and neighbouring land.	L
Contribution of clean energy	N

L **Local** R **Regional** N **National** I **International**

As can be seen from the table above, the majority of potential impacts identified to be associated with the construction of the Prieska Solar Energy Facility are anticipated to be localised and restricted to the proposed site itself (apart from social impacts – job creation which could have more of a regional positive impact; and visual impacts which would extend beyond the site boundaries), while operational phase impacts range from local to regional and national (being the positive impact of contribution of clean energy as part of the energy mix in South Africa; and visual impacts which would extend beyond the site boundaries).

Areas of potential environmental sensitivity were identified through the scoping phase. These areas of sensitivity relate only to ecological aspects of the site and are illustrated in the sensitivity map (refer to Figure 6.1). The sensitivity map is a rough scale estimate of sensitivity on the site identified at a desk-top level. These areas will be subject to survey and ground-truthing during the EIA phase of the project. This preliminary sensitivity map does not represent no-go areas but rather provides an outline of potentially sensitive areas identified through scoping within which more detailed investigation is required. These potentially sensitive areas will, therefore, be further investigated and assessed through detailed specialist studies (including field surveys) during the EIA phase of the process (refer to Chapter 7 for more details). The map will be further refined in the EIA phase on the basis of these specialist studies, in order to inform the final design of the facility. In addition, any additional areas of sensitivity not identified at this stage in the process will be defined and indicated. In order to assess potential impacts within sensitive areas, the preliminary layout for the solar energy facility will be considered in the EIA phase.

In order to assess the potential impacts within sensitive areas, the preliminary layout for the Prieska Solar Energy Facility will be considered in the EIA phase. This preliminary sensitivity analysis of the site should be considered by Jouren Solar (Pty) Ltd in understanding which area of the site would be least impacted by the development of a solar energy facility in order to inform the preliminary infrastructure layouts for consideration within the EIA phase. Through the EIA phase more detailed studies will be conducted, and further sensitive areas will be marked, more accurately and in more detail than in this Draft Scoping Report.

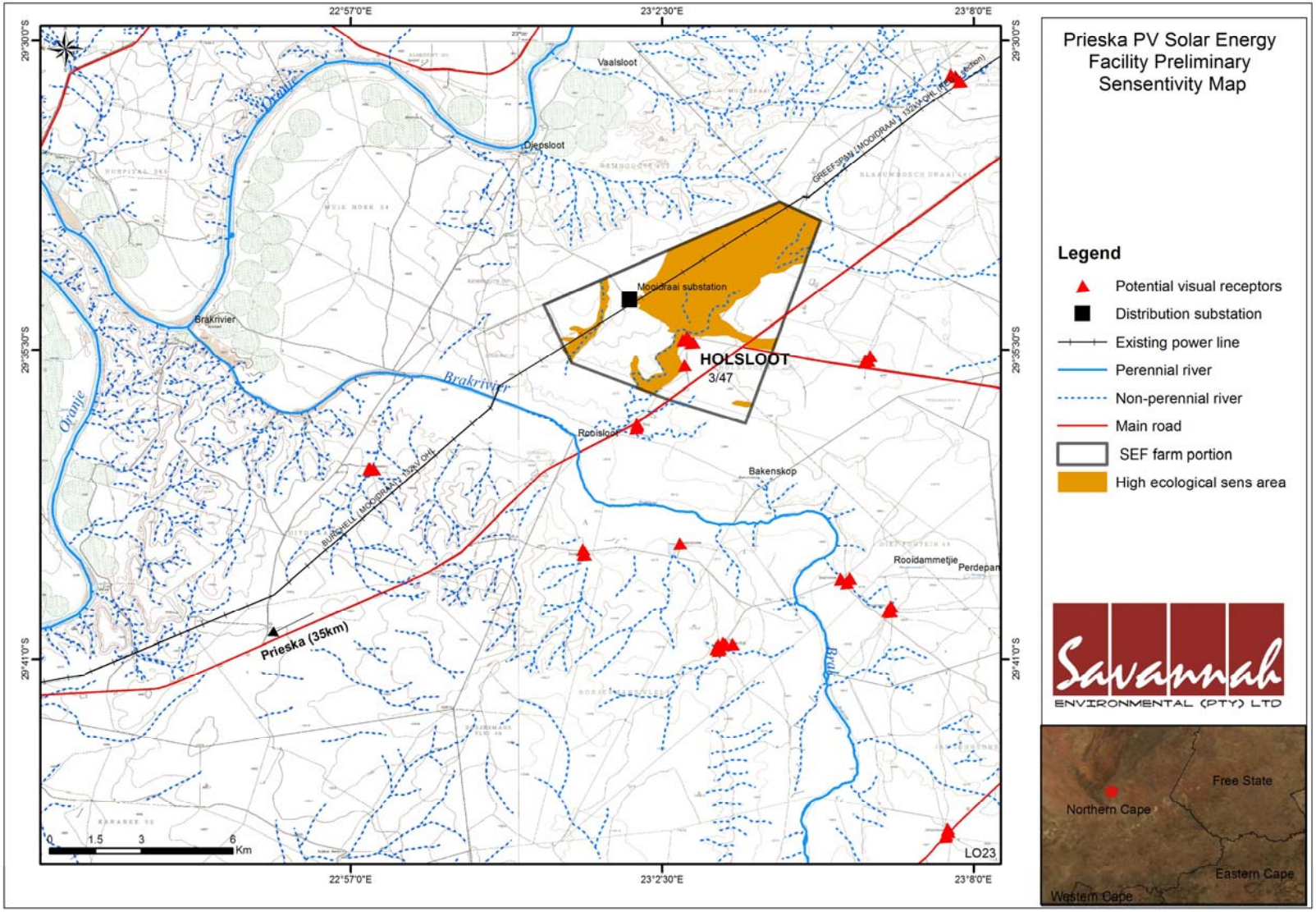


Figure 6.1: Preliminary environmental sensitivity map for the proposed Prieska Solar Energy Facility

The potentially sensitive areas/environmental features/issues that have been identified (as shown in Figure 6.1) for further study include:

» **Ecologically sensitive areas (terrestrial) that occur on the site:**
Protected and red-data plant and/ animal species could potentially occur on the site. However, it is unlikely that the development, once the final layout has been designed in accordance to findings of a field investigation, will compromise the survival of any of the species of conservation concern. There are also low rocky ridges that could be remotely identified. These habitats are sensitive because of their ecosystem functions – providing specialised niches for fauna and flora, creating corridors in the landscape, catching sedimentation and concentrating water runoff. A detailed ecological survey and sensitivity assessment will be undertaken during the EIA.

» **Drainage lines within the site:**
The site is in a very arid area. There are a number of dry stream beds and drainage areas. Drainage lines (water resources) represent particularly vital natural corridors as they function both as wildlife habitat, providing resources needed for survival, reproduction and movement, and as biological corridors, providing for movement between habitat patches. The drainage lines shown in the desktop sensitivity map have been mapped as linear features only. The actual extent will be identified during field work on the next phase of the assessment.

» **Potential visual receptors/ homesteads around the site:**
The study area is sparsely populated (approximately 1.4 persons per km^2), with the highest concentration of people living in towns such as Prieska. However, there are homesteads and settlements present within the study area that could experience visual impacts from the solar panels and/or disturbances during construction of the facility. These homesteads include: Rooisloot, Taaibos, Ratelpan, Annexdraai, Diepfontein, Diepfontein 2, Rooidam, Johnsonspan and Herbou, which all occur within a 16km radius of the proposed facility[4]. The town of Prieska lies 30km from the proposed site, and will not be visually exposed to the proposed facility.

The level of sensitivity on the proposed site still needs to be determined. However, it can be assumed that within the area shown in the sensitivity map, the drainage lines could potentially be a no go area. The area of high ecological sensitivity occupies an area of ~2083 ha. The broader farm portion is 3100 ha. Should the area of high ecological sensitivity be avoided, this still leaves ~1017 ha available for the development of the facility and associated infrastructure. Note that ~200 ha will be required for the solar panels. Through the EIA phase more

[4] It is uncertain whether all of the potentially affected farmsteads are inhabited or not. It stands to reason that farmsteads that are not currently inhabited will not be visually impacted upon at present. These farmsteads do, however retain the potential to be affected visually should they ever become inhabited again in the future. For this reason, the VIA report operates under the assumption that all the homesteads are inhabited. This will be verified during the EIA phase.

detailed studies will be conducted, and any sensitive areas will be marked, more accurately and in more detail than in this Draft Scoping Report.

6.2. Evaluation of the Potential Issues with Associated Infrastructure

In order to connect the solar energy facility to the power grid, invertors will be used and a substation will be built on the site, to connect to the existing power line which is located on the site. The final point of connection will be dependent on the requirements of and agreements with Eskom.

Potential issues identified to be associated with the substation, internal access roads and invertors include impacts on flora, fauna and ecological processes, and potential impacts on heritage sites and visual impacts. The potential impacts with regard to associated infrastructure will be considered in detail within the EIA phase. Recommendations regarding a preferred location for this infrastructure and appropriate mitigation measures (if required) will be made. Other infrastructure such as the internal substation location/s (if required), access roads and the maintenance facility will also be considered in the EIA phase based on the preliminary layout to be provided by Jouren Solar (Pty) Ltd.

PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT CHAPTER 7

This Draft Scoping Report includes a detailed description of the nature and extent of the proposed Prieska solar energy facility with details regarding the Scoping Phase, as well as the issues identified and evaluated through the Scoping Phase (to date). This chapter provides the context for a Plan of Study for the EIA.

The Plan of Study describes how the EIA Phase will proceed and includes details of the specialist studies required to be undertaken 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 specialist team and are used to inform the Plan of Study for EIA together with the requirements of the NEMA EIA Regulations of June 2010 (as amended) 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. All feasible alternatives (including the 'do nothing' alternative) will be assessed.

7.2. Authority Consultation

Consultation with the regulating authorities (i.e. DEA and NC DENC) has been undertaken and will continue throughout the EIA process. On-going consultation and input from DEA and NC 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 and site visit with DEA and NC 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:** Jouren Solar (Pty) Ltd does not establish the proposed Prieska Solar Energy Facility on Portion 3 of the Farm Holsloot 47.
» **Layout/design alternatives:** in terms of the design of the facility, particularly the layout of the PV panels and corridors/servitudes for associated infrastructure such as the access roads and power line/s.
» **Alternative technology combinations:** for use in the establishment of the proposed facility. The facility is proposed to accommodate up to 75 MW which will be comprised of either tracking or concentrating PV.

7.4. Assessment of Potential Impacts and Recommendations regarding Mitigation Measures

Based on the findings of the Draft Scoping Study, the following issues were identified as not requiring further investigation within the EIA:

» Agricultural Potential - due mainly to the low agricultural potential of the soils on the site and the prevailing climatic limitations for agricultural land-use of the site, the agricultural potential specialist has determined that a detailed soil investigation will not be necessary during the EIA Phase.

Table 7.1: Summary of the issues which require further investigation within the EIA phase and activities to be undertaken in order to assess the significance of these potential impacts for Prieska solar energy facility project

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
Ecology	The ecology study will include: » A field survey of plant species of conservation concern which will only be identifiable during the growing season, thus any field survey of vegetation should only commence from March and be completed by April. » It must be noted that this area has not been extensively collected, thus species that have not been captured in the POSA SANBI species database for the area up to date, may in fact be found within the study area. » A detailed ecological survey and sensitivity assessment will be undertaken during the EIA phase. » A detailed ecological survey and assessment will be undertaken during the EIA phase to determine which species could possible tolerate high levels of shade and the erosion potential of different landscapes within the study area » Predictions about altered runoff patterns and possible species composition after shading will, however, be based on best knowledge available, not on actual facts. » An assessment of the potential impacts on ecology will be undertaken. » Mitigation measures for the EMP will be provided.	Marianne Strohbach – Savannah Environmental (Pty) Ltd
Soil Study	The soils specialist study will include: » A detailed site visit will have to be conducted as part of the EIA level investigation. » The following parameters will be investigated: * Land capability, current land-use and degradation status of the agricultural resources (i.e. soil and vegetation. * Geology and soils, with special reference to sensitivity to erosion and factors contributing to erosion (i.e. slopes, etc.) * Climate * Agriculturally sensitive areas or areas with high agricultural value (i.e. lands, wetlands and watercourses. * Agricultural infrastructure (i.e. silos, irrigation, lines, pivot points, channels, feeding structures, etc.) that will be impacted upon.	L.G du Pisani – Eduplan cc

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
Heritage	A heritage specialist will conduct a heritage study including: » In order to comply with the National Heritage Resources Act (Act No 25 of 1999) a Phase 1 Archaeological Impact Assessment will be undertaken. During this study the following will be conducted: * Sites of archaeological, historical or places of cultural interest will be located, identified, recorded, photographed and described. * The levels of significance of recorded heritage resources will be determined and mitigation proposed * Should any significant sites be impacted upon recommendation will be made to ensure that all the requirements of SAHRA are met. * A desktop Palaeontology assessment will also be undertaken, in line with SAHRA's requirements.	Stephan Gaigher – G&A Heritage Consultant
Visual	Additional spatial analyses will be undertaken in order to create a visual impact index that will further aid in determining potential visual impact. Specific spatial criteria need to be applied to the visual exposure of the proposed facility in order to successfully determine visual impact and ultimately the significance of the visual impact. The Plan of Study for EIA is as follows: » **Determine Visual Distance/Observer Proximity to the facility** In order to refine the visual exposure of the facility on surrounding areas/receptors, the principle of reduced impact over distance is applied in order to determine the core area of visual influence. Proximity radii for the proposed development site are created in order to indicate the scale and viewing distance of the facility and to determine the prominence of the facility in relation to their environment. MetroGIS determined the proximity radii based on the anticipated visual experience of the observer over varying distances. The distances are adjusted upwards for larger facilities and downwards for smaller facilities (i.e. depending on the size and nature of the proposed infrastructure). MetroGIS developed this methodology in the absence of any known and/or acceptable standards for South African solar energy facilities. The proximity radii (calculated from the boundary lines of the farm) are as follows: * 0 - 3km. Short distance view where the facility would dominate the frame of vision and	Lourens du Plessis - MetroGIS

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	constitute a very high visual prominence. * 3 - 6km. Medium distance view where the facility would be easily and comfortable visible and constitute a high to moderate visual prominence. * 6 - 12km. Medium to longer distance view where the facility would become part of the visual environment, but would still be visible and recognisable. This zone constitutes a moderate to low visual prominence. * Greater than 12km. Long distance view of the facility where it could potentially still be visible though not as easily recognisable. This zone constitutes a very low visual prominence for the facility. » **Determine Viewer Incidence/Viewer Perception** The number of observers and their perception of a structure determine the concept of visual impact. If there are no observers, then there would be no visual impact. If the visual perception of the structure is favourable to all the observers, then the visual impact would be positive. It is therefore necessary to identify areas of high viewer incidence and to classify certain areas according to the observer's visual sensitivity towards the proposed SEF and its related infrastructure. It would be impossible not to generalise the viewer incidence and sensitivity to some degree, as there are many variables when trying to determine the perception of the observer; regularity of sighting, cultural background, state of mind, and purpose of sighting which would create a myriad of options. » **Determine the Visual Absorption Capacity (VAC) of the natural vegetation** This is the capacity of the receiving environment to absorb or screen the potential visual impact of the proposed facility. The VAC is primarily a function of the vegetation, and will be high if the vegetation is tall, dense and continuous. Conversely, low growing sparse and patchy vegetation will have a low VAC.	

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	The digital terrain model utilised in the calculation of the visual exposure of the facility does not incorporate the potential visual absorption capacity (VAC) of the natural vegetation of the region. It is therefore necessary to determine the VAC by means of the interpretation of the vegetation cover, supplemented with field observations. » **Determine the Visual impact index** The results of the above analyses are merged in order to determine where the areas of likely visual impact would occur. These areas are further analysed in terms of the previously mentioned issues (related to the visual impact) and in order to judge the severity of each impact. The above exercise should be undertaken for the core SEF as well as the ancillary infrastructure (i.e. the power lines, administrative building, internal access roads and workshop). The site-specific issues 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, as well as suggested mitigation measures. » Both primary and secondary impacts should be addressed, as well as cumulative impacts.	
Social	The social study will include: » **Policy and planning issues** The review of key national and provincial level energy policy documents indicated that the development of energy from renewable sources is strongly supported at both levels. At a local level the PKSDM IDP makes reference to need to consider access to electricity or alternative sources of energy for all. » **Local and site specific issues** The following issues will be addressed in the EIA phase: * Impact on rural sense of place (this will be closely linked to the visual impacts). The	Tony Barbour – Tony Barbour Environmental Consulting

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	impact on sense of place is also linked to the associated power lines; * Impact on tourism, both locally and regionally. This impact will be linked to the visual impacts and impact on the areas sense of place and the landscape. As indicated in the NCPGDP, tourism is one of the key economic sectors in the region; * Impact on farming activities; * Impact on property prices; * Influx of job seekers into the area during the construction phase. The influx of job seekers may result in an increase in sexually transmitted diseases, including HIV/AIDS; increase in prostitution; increase in alcohol and drug related incidents; increase in crime; and creation of tension and conflict in the community; * 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; * Benefits associated with the establishment of a Community Trust; * Provision of clean, renewable energy source for the national grid. In terms of potential impacts on local farmers in the area the following issues will need to be assessed: » Potential threat to farm safety due to increased number of people in the area and construction workers; » Potential stock losses (during the construction and operational phase); » Potential damage to water and other farm infrastructure (during the construction and operational phase); » Potential damage to roads by heavy equipment and increased traffic volumes (during the construction and operational phase); » Potential impact on farming operations and loss of productive land (during the construction and operational phase).	

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 the developer 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 programme**
- 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 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 feedback meeting will be held during this public review period. Should there be significant changes between the draft EIA report and final EIA report, then the public would be provided with an opportunity to provide comment on the Final EIA report directly to DEA (reporting will be released for public review for a further period of 21 days).

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.

Table 7.2: Envisaged key milestones of the programme for the EIA phase of the project

Key Milestone Activities	Timeline
Public review period for Draft Scoping report	30-day public review period from 03 September 2012 – 03 October 2012
Submission of Final Scoping Report to DEA	October 2012
Authority acceptance of the Environmental Scoping Report and Plan of Study to undertake the EIA	30-days after receiving the Final Scoping Report
Make draft EIA Report and draft EMP available to the public, stakeholders and authorities	30-day public review period
Authority review period for Final EIA report to issue a Environmental Authorisation	Within 105 days after receiving the Final EIA report.