



Scatec Solar
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SCOPING REPORT



Scoping and Environmental Impact Assessment

for the Proposed Development of a
75 MW Solar Photovoltaic Facility
(KENHARDT PV 1) on the remaining
extent of Onder Rugzeer Farm 168,
north-east of Kenhardt, Northern
Cape Province

Prepared for:
Scatec Solar SA 330 (PTY) Ltd

CSIR Report No.: CSIR/CAS/EMS/ER/2015/0007/B

September 2015

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report details

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Prepared for:	<p>This Scoping Report forms part of a series of reports and information sources that are being provided during the Environmental Impact Assessment (EIA) Process for the proposed Kenhardt PV 1 project. In accordance with the EIA Regulations, the purpose of the Scoping Report is to:</p> <ul style="list-style-type: none"> • Provide a description of the proposed project, including a sufficient level of detail to enable stakeholders to identify relevant issues and concerns; • Describe the local environmental and development context within which the project is proposed, to assist further in identifying issues and concerns; • Provide an overview of the process being followed in the Scoping Phase, in particular the Public Participation Process, as well as present the Plan of Study for EIA that would be followed in the subsequent EIA Phase; and • Present the issues and concerns identified to date from the stakeholder engagement process, together with an explanation of how these issues will be addressed through the EIA Process. <p>This Scoping Report is being made available to all stakeholders for a 30-day review period.</p>
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contents

	Executive Summary
Chapter 1	Introduction
Chapter 2	Project Description
Chapter 3	Description of the Affected Environment
Chapter 4	Approach to EIA Process and Public Participation
Chapter 5	Project Alternatives
Chapter 6	Issues and Potential Impacts
Chapter 7	Issues and Responses Trail
Chapter 8	Plan of Study for EIA
Chapter 9	References

APPENDICES

Appendix A	Curriculum Vitae of the Environmental Assessment Practitioner
Appendix B	Declaration of the Environmental Assessment Practitioner
Appendix C	Database of Interested and Affected Parties
Appendix D	Copy of Newspaper Advertisement placed for the Release of the BID (Project Initiation Phase)
Appendix E	Copies and Proof of Correspondence sent to I&APs
Appendix F	Copy of Site Notice Board and Proof of Placement
Appendix G	Copies of Correspondence from I&APs during the Project Initiation Phase and prior to release of Scoping Report

executive summary

PROJECT OVERVIEW

Scatec Solar SA 163 (PTY) Ltd is proposing to develop three 75 Megawatt (MW) Solar Photovoltaic (PV) power generation facilities and associated electrical infrastructure (132 kV transmission lines for each 75 MW facility) on the remaining extent of Onder Rugzeer Farm 168 and the connection points to the Eskom Nieuwehoop Substation on the remaining extent of Portion 3 of Gembok Bult Farm 120, approximately 80 km south of Upington and 30 km north-east of Kenhardt within the !Kheis Local Municipality, Northern Cape Province. Scatec Solar SA 163 (PTY) Ltd consists of various subsidiary companies, one of which is Scatec Solar SA 330 (PTY) Ltd. Scatec Solar SA 330 (PTY) Ltd (hereinafter referred to as Scatec Solar) is the Project Applicant for this proposed 75 MW solar PV project (referred to as Kenhardt PV 1).

In terms of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) and the 2014 NEMA Environmental Impact Assessment (EIA) Regulations promulgated in Government Gazette 38282 and Government Notice (GN) R982, R983, R984 and R985 on 8 December 2014, a full Scoping and EIA Process is required for the construction of the three Solar PV facilities. A separate Basic Assessment Process will be undertaken for the development of the proposed transmission lines, associated electrical infrastructure and connection to the Eskom Nieuwehoop Substation. The Applicant has appointed the Council for Scientific and Industrial Research (CSIR) to undertake the separate EIA and Basic Assessment Processes in order to determine the biophysical, social and economic impacts associated with undertaking the proposed activity.

Since the proposed 75 MW Solar PV facilities are located within the same geographical area and constitute the same type of activity, an integrated Public Participation Process (PPP) will be undertaken for the proposed projects. However, separate Applications for Environmental Authorisation (EA) have been lodged with the Competent Authority (i.e. the National Department of Environmental Affairs (DEA)) for each proposed Scoping and EIA project and will be lodged for each Basic Assessment project. Furthermore, separate reports (i.e. Basic Assessment and Scoping and EIA Reports) will be compiled for each project. The Basic Assessment Reports will be made available for Interested and Affected Party (I&AP) review with the EIA Reports.

The proposed 75 MW Solar PV facility projects (requiring a Scoping and EIA Process) are referred to as:

- Kenhardt PV 1;
- Kenhardt PV 2; and
- Kenhardt PV 3.

The proposed 132 kV transmission line projects (requiring a Basic Assessment Process) are referred to as:

- Kenhardt PV 1 - Transmission Line;
- Kenhardt PV 2 - Transmission Line; and
- Kenhardt PV 3 - Transmission Line.

This Scoping Report only discusses the proposed **Kenhardt PV 1** project.

NEED FOR THE PROJECT

The Integrated Resource Plan for South Africa for the period 2010 to 2030 (referred to as “IRP 2010”) was released by government in 2010, and proposes to develop and secure 17 800 MW of renewable energy capacity by 2030 (including wind, solar and other energy sources). The IRP was updated in 2013. The IRP 2010 has set up a target of 3 725 MW of renewable energy to be produced by Independent Power Producers (IPPs) by 2016. On 18 August 2015, an additional target of 6 300 MW to be procured and generated from renewable energy sources was added to the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) as noted Government Gazette 39111. The additional target allocated for solar PV energy is 2 200 MW.

In 2011, the Department of Energy (DOE) launched the REIPPPP and invited potential IPPs to submit proposals for the financing, construction, operation and maintenance of the first 3 725 MW of onshore wind, solar thermal, solar PV, biomass, biogas, landfill gas or small hydro projects. The two main evaluation criteria for compliant proposals are price and economic development, with other selection criteria including technical feasibility and grid connectivity, environmental acceptability, black economic empowerment, community development, and local economic and manufacturing propositions. The bidders with the highest rankings (according to the aforementioned criteria) are appointed as “Preferred Bidders” by the DOE. The proposed projects aim to contribute to the above strategic imperative.

PROJECT DESCRIPTION

It is important to point out at the outset that the exact specifications of the proposed project components will be determined during the detailed engineering phase.

Linked to enhancing its operations within South Africa, the 75 MW Solar PV facility (i.e. Kenhardt PV 1) proposed by Scatec Solar will cover an approximate area of 250 hectares (ha). A preferred and alternative site (referred to as Kenhardt PV 1b) have been considered in the Scoping Phase. The preferred site will be assessed in the EIA Phase. The preferred site includes approximately 450 ha of land. Due to the fact that this project only requires 250 ha of land, there is scope to avoid major environmental constraints through the final design of the facility.

The proposed project will make use of PV solar technology to generate electricity from the sun’s energy. The Applicant is proposing to develop a facility with a possible maximum installed capacity of 100 MW Direct Current (DC) which produces 75 MW Alternating Current (AC) of electricity from PV solar energy.

Once a Power Purchase Agreement (PPA) is awarded, the proposed facility will generate electricity for a minimum period of 20 years. It is proposed that Scatec Solar will implement the Self-Build Option for the additional electrical infrastructure to be constructed (which includes the 132 kV transmission line and additional feeder bay(s), busbar(s), transformer bay, and extension to the platform at the Eskom Nieuwehoop Substation (which will be assessed separately as part of a Basic Assessment Process)). Following the construction phase, the proposed transmission line will either be transferred into the ownership of Eskom or remain in the ownership of Scatec Solar.

The solar facility will consist of the following components:

- Solar Field:
 - Solar Arrays:
 - PV Modules;
 - Tracking structures;
 - Solar module mounting structures comprised of galvanised steel and aluminium; and
 - Foundations which will likely be drilled and concreted into the ground.

- Building Infrastructure:
 - Offices;
 - Operational and maintenance control centre;
 - Warehouse/workshop;
 - Ablution facilities;
 - Converter station;
 - On-site substation building; and
 - Guard House.

- Associated Infrastructure
 - 132 kV overhead transmission line (as mentioned above this will be subject to a separate Basic Assessment Process, referred to as Kenhardt PV 1 - Transmission Line);
 - Associated electrical infrastructure at the Eskom Nieuwehoop Substation (including but not limited to feeders, Busbars, transformer bay and extension to the platform at the Eskom Nieuwehoop Substation) (as mentioned above this will be subject to a separate Basic Assessment Process, referred to as Kenhardt PV 1 - Transmission Line);
 - On-site substation;
 - Internal transmission lines/underground cables;
 - Underground low voltage cables or cable trays;
 - Access roads;
 - Internal gravel roads;
 - Fencing;
 - Panel maintenance and cleaning area;
 - Stormwater channels;
 - Water pipelines; and
 - Temporary work area during the construction phase (i.e. laydown area).

NEED FOR AN ENVIRONMENTAL IMPACT ASSESSMENT

As noted above, in terms of the EIA Regulations promulgated under Chapter 5 of the NEMA published in GN R982, R983, R984 and R985 on 4 December 2014 and enforced on 8 December 2014, a full Scoping and EIA Process is required for the proposed project. The need for the full Scoping and EIA is triggered by, amongst others, the inclusion of Activity 1 listed in GN R984 (Listing Notice 2):

- *“The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs within an urban area”.*

Given that energy related projects have been elevated to national strategic importance in terms of the EA Process, the proposed project requires authorisation from the National DEA, acting in consultation with other spheres of government.

The purpose of the EIA is to identify, assess and report on any potential impacts the proposed project, if implemented, may have on the receiving environment. The Environmental Assessment therefore needs to show the Competent Authority, the DEA; and the project proponent, Scatec Solar, what the consequences of their choices will be in terms of impacts on the biophysical and socio-economic environment and how such impacts can be, as far as possible, enhanced or mitigated and managed as the case may be.

PURPOSE OF THE SCOPING REPORT

The Scoping Phase of the EIA refers to the process of determining the spatial and temporal boundaries for the EIA. In broad terms, the objectives of the Scoping Process in terms of the 2014 NEMA EIA Regulations (GN R982) are to:

- Confirm the process to be followed and opportunities for stakeholder engagement;
- Clarify the project scope to be covered;
- Identify and confirm the preferred activity and technology alternative;
- Identify and confirm the preferred site for the preferred activity;
- Identify the key issues to be addressed in the impact assessment phase and the approach to be followed in addressing these issues; and
- Confirm the level of assessment to be undertaken during the impact assessment

This is achieved through parallel initiatives of consulting with:

- The lead authorities involved in the decision-making for this EIA application;
- The public to ensure that local issues are well understood; and
- The EIA specialist team to ensure that technical issues are identified.

The Scoping Process is supported by a review of relevant background literature on the local area. Through this comprehensive process, the environmental assessment can identify and focus on key issues requiring assessment.

The primary objective of the Scoping Report is to present key stakeholders (including affected organs of state) with an overview of the project and key issues that require assessment in the EIA Phase and allow the opportunity for the identification of additional issues that may require assessment.

Issues raised thus far during the Scoping Process have been captured in the Issues and Responses Trail in Chapter 7 of the Scoping Report. Issues raised in response to this Scoping Report (currently being released for a 30-day comment period) will be captured in an Issues and Responses Trail as an appendix to the Scoping Report, which will be submitted to the National DEA for decision-making (i.e. approval or rejection) in line with Regulation 21 (1) of GN R982. This approval is planned to mark the end of the Scoping Phase after which the EIA Process moves into the impact assessment and reporting phase.

IDENTIFICATION OF ISSUES

The project was advertised in one local newspaper and letters regarding the Basic Assessment and EIA Process were mailed to all pre-identified key stakeholders on the database. The Scoping Report includes the issues identified to date as part of the Scoping Process. A synthesis of these issues is provided in the Issues and Response Trail (Chapter 7), which includes an explanation of how the issues will be addressed in the EIA Phase.

The list below indicates the main issues identified thus far during the Scoping Phase and to be addressed during the EIA Process.

Terrestrial Ecology Impacts:

- Construction Phase: Ousting of fauna through increased anthropogenic activities, disturbance of refugia (location of an isolated population that was widespread in the past) and general change in habitat.
- Construction Phase: Increased electrical light pollution leading to changes in nocturnal behavioural patterns amongst fauna.

- Construction Phase: Exclusion (or entrapment) of in particular, larger fauna on account of the fencing of the site.
- Construction Phase: Changes in edaphics (soils) on account of excavation and import of material, leading to alteration of plant communities and fossorial species in and around these points.
- Operational Phase: Alteration of ecological processes on account of the exclusion of certain species inherent to the functional state of land within the PV facility i.e. larger fossorial species and predators will be excluded from the PV facility site by virtue of its fencing, generally leading to possible variations in populations of other species that remain within the site, with concomitant ecological change.
- Operational Phase: Increased shading of vegetation as a consequence of the PV arrays, will lead to changes in plant water relations and possible changes in plant community structures within the site.
- Operational Phase: Changes in meteorological factors at a localised scale on account of the PV facility is likely to arise (e.g. subtle changes in wind dynamics, “heat bubbles”, as well as alteration in run off of surface water and evapo-transpiration states), leading to long term, but generally latent changes in habitat.
- Operational Phase: The fencing of the site, possibly with electric fencing, is likely to impact upon faunal behaviour, leading to the exclusion of certain species and possible mortalities. Alternatively, such changes may also favour some specific individuals, particularly those that remain within the confines of the proposed PV facility, which is likely to lead to further localised alteration in habitat and ecological processes within the facility.

Aquatic Ecology Impacts:

- Construction Phase: Alteration in surface drainage patterns on account of construction activities leading to rapid change in plant communities and general habitat structure both within the site and immediately adjacent to site.
- Construction Phase: Alteration of surface water quality on account of construction activities that lead to changes in water chemistry (e.g. use of concrete, increased hydrocarbon input, increased sediment within run off etc. alter various chemical parameters).
- Construction Phase: Depending upon the origin of water (import or through abstraction of groundwater) changes in sub-surface water resources may arise, particularly in the case of the latter.
- Operational Phase: Abstraction of ground water for the cleaning of modules will alter the state of sub-surface water resources, depending upon nature and origin of such water.

Visual Impacts:

- Construction Phase: Potential visual intrusion of construction activities on the existing views of sensitive visual receptors in the rural landscape.
- Construction Phase: Potential visual intrusion of a large area cleared of vegetation on the existing views of sensitive visual receptors.
- Construction Phase: Potential visual impact of night lighting during the construction phase on the nightscape of the region.
- Operational Phase: Potential landscape impact of introducing a large solar plant into a remote rural landscape.
- Operational Phase: Potential visual intrusion of a large solar field on the existing views of sensitive visual receptors.
- Operational Phase: Potential visual intrusion of tall, relatively large structures on the existing views of sensitive visual receptors.
- Operational Phase: Potential impact of night lighting of the development on the relatively dark rural nightscape.

Archaeology and Cultural Landscape:

- Construction and Operational Phases:
 - Direct disturbance and/or destruction of archaeological material;
 - Direct impacts to the landscape through introduction of industrial type facilities; and
 - Direct disturbance and/or destruction of possible graves (although unlikely).

Palaeontology:

- Potential damage to or destruction of fossil heritage at or near the surface within the study area.

Geohydrology:

- Construction and Operational Phases:
 - Limited groundwater availability in the region;
 - Water quality of the existing boreholes present within the study area; and
 - Borehole yields of existing boreholes that are present within the study area.

Soils and Agricultural Potential

- Operational Phase: Economic consequences of the proposed project at local/regional scale due to the modification/loss of agricultural potential on the site.
- Operational Phase: Whether soil conditions will be transformed and agricultural soil resources will be damaged or lost.

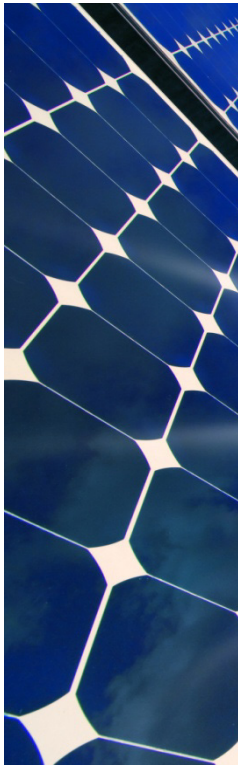
Social Issues:

- Construction and Operational Phases:
 - Influx of jobseekers;
 - Increased competition for urban-based employment;
 - Increases in social deviance;
 - Increases in incidence of HIV/AIDS infections;
 - Expectations regarding jobs;
 - Local spending;
 - Local employment; and
 - Job losses at the end of the project life-cycle.

The Plan of Study for EIA (Chapter 8) presents the approach to the forthcoming EIA Phase. This includes the Terms of Reference for the various specialist studies that are proposed to address the issues raised, where necessary.



glossary



AC	Alternating Current
ADT	Average Daily Traffic
AGIS	Agricultural Geo-Referenced Information System
BGIS	Biodiversity Geographic Information System
BID	Background Information Document
CA	Competent Authority
CBA	Critical Biodiversity Area
CPV	Concentrated Photovoltaic
CSP	Concentrated Solar Power
CSIR	Council for Scientific and Industrial Research
DAFF	National Department of Agriculture, Forestry and Fisheries
DEA	National Department of Environmental Affairs
DEA&DP	Western Cape Department of Environmental Affairs and Development Planning
DC	Direct Current
DM	Siyanda District Municipality
DMR	National Department of Minerals Resources
DOE	Department Of Energy
DOT	National Department of Transport
DSR	Draft Scoping Report
DWA	National Department of Water Affairs
EA	Environmental Authorization
EAP	Environmental Assessment Practitioner
EC	Electrical Conductivity
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ESA	Ecological Support Area
FEPA	Freshwater Ecosystem Protection Areas
FSR	Final Scoping Report
GA	General Authorization
GG	Government Gazette
GIS	Geographical Information Systems
GN R	Government Notice Regulation
HPM	Hydraulic Plant Module
I&AP	Interested and Affected Party
IEM	Integrated Environmental Management
ICB	Iron Chromium Battery
IDP	Integrated Development Plan
IPP	Independent Power Producer
IRP	Integrated Resource Plan
kWh	Kilowatt Hours
LSA	Later Stone Age
Mf	Friesdale Charkonite
Mja	Jacomys Pan Formation
Mks	Klip Koppies Granite

MSA	Middle Stone Age
MW	Megawatts
NBA	South African National Parks
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act
NERSA	National Energy Regulator of South Africa
NFEPA	National Freshwater Ecosystems Protected Areas
NHRA	National Heritage Resources Act (Act 25 of 1999)
NPAES	National Protected Expansion Strategy
NWA	National Water Act (Act No. 36 of 1998)
PES	Present Ecological State
PPA	Power Purchasing Agreement
PV	Photovoltaic
REDZs	Renewable Energy Development Zones
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
S&EIR	Scoping and Environmental Impact Reporting
SABAP2	South African Bird Atlas Project
SAHRA	South African Heritage Resources Agency
SANRAL	South African National Roads Agency Limited
SANS	South African National Standards
SANBI	South African National Biodiversity Institute
SARERD	South African Renewable Energy Resource Database
SDF	Spatial Development Framework
TDS	Total Dissolved Solids
ToR	Terms of Reference
WASA	Wind Atlas of South Africa
WMA	Water Management Area
WULA	Water Use License Application

SCOPING REPORT



CHAPTER 1: Introduction

Scoping and Environmental Impact Assessment for the Proposed Development of a 75 MW Solar Photovoltaic Facility (KENHARDT PV 1) on the remaining extent of Onder Rugzeer Farm 168, north-east of Kenhardt, Northern Cape Province

contents

1. INTRODUCTION	1-2
1.1. Project Applicant and Project Overview	1-4
1.2. Project Motivation (Including Need and Desirability)	1-5
1.2.1. <i>Need and Desirability</i>	1-6
1.3. Requirements for an EIA	1-11
1.4. EIA Team	1-12
1.5. Details and Expertise of the Environmental Assessment Practitioners	1-13
1.6. Objectives for this Scoping Report	1-14

tables

Table 1.1: DEADP list of 14 questions to determine the “Need and Desirability” of a proposed project - Kenhardt PV 1	1-7
Table 1.2: The EIA Management Team	1-12
Table 1.3: Requirements of a Scoping Report as defined in terms of Appendix 2 of GN R982	1-15

figures

Figure 1.1: Locality of the three proposed 75 MW PV Facilities and Transmission Lines	1-3
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1. INTRODUCTION

Scatec Solar SA 163 (PTY) Ltd is proposing to develop three 75 Megawatt (MW) Solar Photovoltaic (PV) power generation facilities and associated electrical infrastructure (132 kV transmission lines for each 75 MW facility) on the remaining extent of Onder Rugzeer Farm 168 and the connection points to the Eskom Nieuwehoop Substation on the remaining extent of Portion 3 of Gembok Bult Farm 120, approximately 80 km south of Upington and 30 km north-east of Kenhardt within the !Kheis Local Municipality, Northern Cape Province. Scatec Solar SA 163 (PTY) Ltd consists of various subsidiary companies, one of which is Scatec Solar SA 330 (PTY) Ltd. Scatec Solar SA 330 (PTY) Ltd (hereinafter referred to as Scatec Solar) is the Project Applicant for this proposed 75 MW solar PV project (referred to as Kenhardt PV 1).



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Since the proposed 75 MW Solar PV facilities are located within the same geographical area and constitute the same type of activity, an integrated Public Participation Process (PPP) will be undertaken for the proposed projects. However, separate Applications for Environmental Authorisation (EA) have been lodged with the Competent Authority (i.e. the National Department of Environmental Affairs (DEA)) for each proposed Scoping and EIA project and will be lodged for each Basic Assessment project. Furthermore, separate reports (i.e. Basic Assessment and Scoping and EIA Reports) will be compiled for each project. The Basic Assessment Reports will be made available for Interested and Affected Party (I&AP) review with the EIA Reports.

The proposed 75 MW Solar PV facility projects (requiring a Scoping and EIA Process) are referred to as:

- Kenhardt PV 1;
- Kenhardt PV 2; and
- Kenhardt PV 3.

The proposed 132 kV transmission line projects (requiring a Basic Assessment Process) are referred to as:

- Kenhardt PV 1 - Transmission Line;
- Kenhardt PV 2 - Transmission Line; and
- Kenhardt PV 3 - Transmission Line.

Figure 1.1 below shows the overall locality of the three proposed 75 MW Solar PV facility projects (and associated alternatives considered in the Scoping Phase) and the transmission line projects.

This Scoping Report therefore only discusses the proposed **Kenhardt PV 1** project, with this chapter providing an introduction to the proposed project, as well as information on the Project Applicant, the appointed Environmental Assessment Practitioner (EAP), and the specialist team.

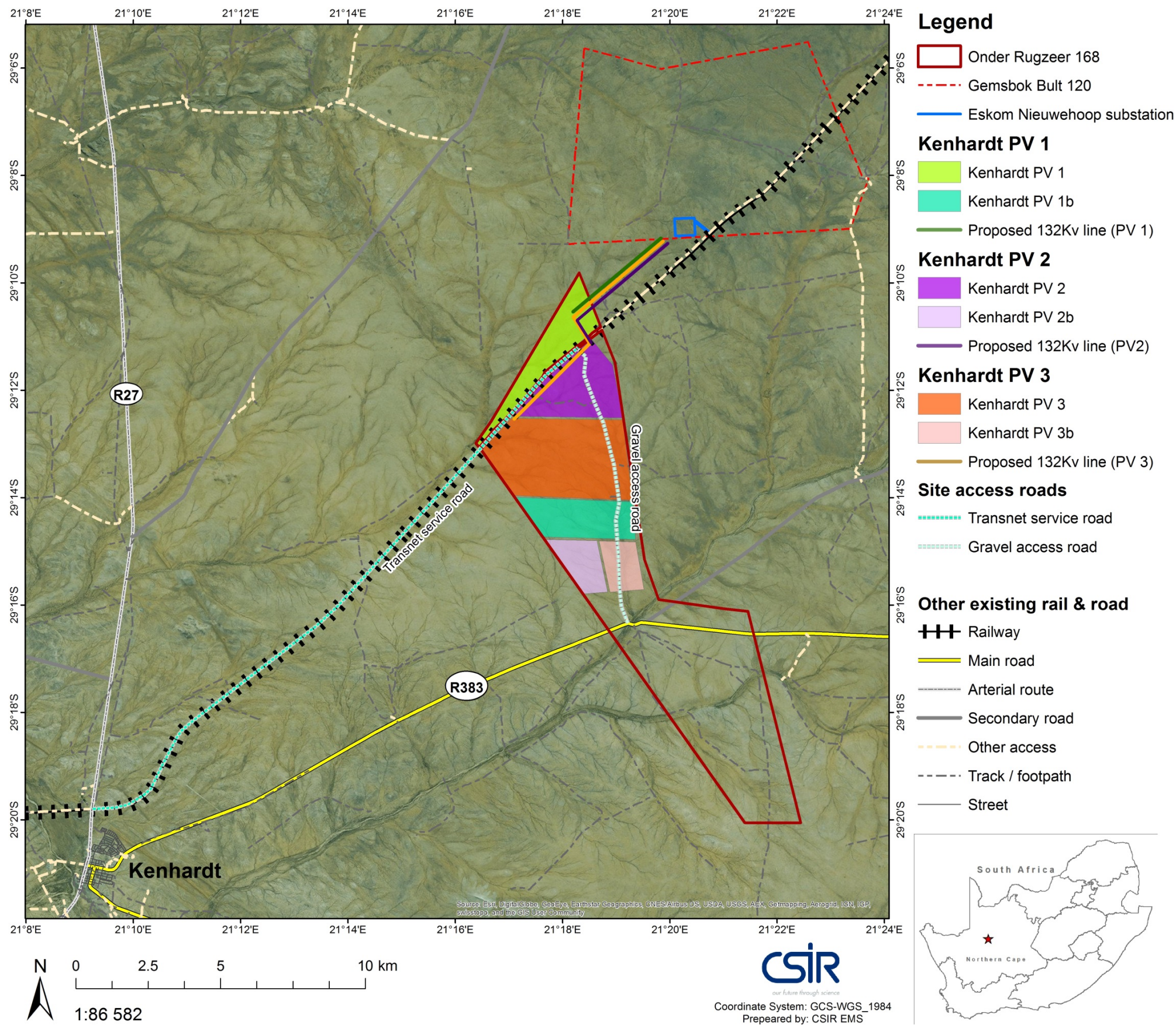


Figure 1.1: Locality of the three proposed 75 MW PV Facilities and Transmission Lines

1.1. Project Applicant and Project Overview

Scatec Solar is an integrated Independent Power Producer (IPP) that is focused on making solar energy a sustainable and affordable source on a global scale. Scatec Solar was founded in 2001 and holds its headquarters in Norway. The company develops, builds, owns and operates a number of solar power plants internationally and within Africa. The company is growing significantly and is currently planned to provide a combined 207 MW of power in the United States, Honduras and Jordan. In addition, Scatec Solar collectively delivers more than 219 MW of power in the Czech Republic, South Africa and Rwanda. Specifically linked to investment within South Africa, Scatec Solar has been involved in the following major solar energy projects:

- The Linde Solar Plant (40 MW) is located in the Northern Cape and is considered to be the first of the large-scale PV plants in production from the second round of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP).
- The Dreunberg Solar Plant (75 MW) is the only REIPPPP Solar PV Project to be located in the Eastern Cape.
- The Kalkbult Solar Plant (75 MW) is located in the Northern Cape and was the first REIPPPP project to be connected to the grid and operational in South Africa.

Scatec Solar was awarded another further 258 MWp in the Fourth Round of the REIPPPP. Dyason's Klip 1, Dyason's Klip 2 and Sirius PV Project One are all anticipated to obtain Financial Closure in Quarter 4 of 2015.

Linked to enhancing its operations within South Africa, the 75 MW Solar PV facility (i.e. Kenhardt PV 1) proposed by Scatec Solar will cover an approximate area of 250 hectares (ha). The proposed project is located in proximity to the Eskom Nieuwehoop Substation, which is currently being constructed on the remaining extent of Portion 3 of Gemsbok Bult Farm 120 (as noted above).

The proposed project will make use of PV solar technology to generate electricity from the sun's energy. The Applicant is proposing to develop a facility with a possible maximum installed capacity of 100 MW Direct Current (DC) which produces 75 MW Alternating Current (AC) of electricity from PV solar energy. Once a Power Purchase Agreement (PPA) is awarded, the proposed facility will generate electricity for a minimum period of 20 years. It is proposed that Scatec Solar will implement the Self-Build Option for the additional electrical infrastructure to be constructed (which includes the 132 kV transmission line and additional feeder bay(s), busbar(s), transformer bay and extension to the platform at the Eskom Nieuwehoop Substation (which will be assessed separately as part of a Basic Assessment Process)). Following the construction phase, the proposed transmission line will either be transferred into the ownership of Eskom or remain in the ownership of Scatec Solar.

The preferred site for the proposed Kenhardt PV 1 project includes approximately 450 ha of land, however the proposed solar facility and associated infrastructure requires a development area of approximately 250 ha only (as shown in Figure 2.2 of Chapter 2 of this Scoping Report). The larger area has been proposed during this phase of the project to ensure that should development constraints be present, the footprint can be reduced without the project being compromised. The proposed project will consist of the following main components:

- **Solar Field**
 - Solar Arrays:
 - PV Modules;
 - Single Axis Tracking structures (aligned north-south), Fixed Axis Tracking (aligned east-west), Dual Axis Tracking (aligned east-west and north-south) or Fixed Tilt Mounting Structure;
 - Solar module mounting structures comprised of galvanised steel and aluminium; and
 - Foundations which will likely be drilled and concreted into the ground.

- Building Infrastructure:
 - Offices;
 - Operational and maintenance control centre;
 - Warehouse/workshop;
 - Ablution facilities;
 - Converter station;
 - On-site substation building; and
 - Guard House.

- **Associated Infrastructure**
 - 132 kV overhead transmission line (which will be subject to a separate Basic Assessment Process, referred to as Kenhardt PV 1 - Transmission Line);
 - Associated electrical infrastructure at the Eskom Nieuwehoop Substation (including but not limited to an additional feeder bay(s), Busbar(s), transformer bay and extension to the platform at the substation (which will be subject to a separate Basic Assessment Process, referred to as Kenhardt PV 1 - Transmission Line);
 - On-site substation;
 - 33 kV internal transmission lines/underground cables;
 - Underground low voltage cables or cable trays;
 - Access roads;
 - Internal gravel roads;
 - Fencing;
 - Panel maintenance and cleaning area;
 - Stormwater channels;
 - Water pipelines; and
 - Temporary work area during the construction phase (i.e. laydown area).

A detailed project description (based on the conceptual design) is provided in Chapter 2 of this Scoping Report.

1.2. Project Motivation (Including Need and Desirability)

At a national level, South Africa is facing serious electricity shortages as well as water scarcity. The proposed project aims to supply additional electricity to the national grid, with negligible demand for water. Importantly, the project will reduce the risk of rolling electricity blackouts, which are anticipated in South Africa's Medium Term Risk Mitigation Plan (MTRM) for electricity from 2011 to 2016. The evolution of South Africa's electricity sector is aligned with the global transition towards renewable sources of electricity generation. The urgency behind this evolution can be appreciated considering that South Africa is the largest emitter of greenhouse gases in Africa, accounting for as much as 42% of the continent's total emissions, and is also estimated to rank amongst the top 20 largest emitters of greenhouse gases in the world. These emissions are largely a result of an energy-intensive economy and high dependence on coal-based electricity generation. Furthermore, water demand is high for conventional coal-based electricity generation. Consequently, the South African government is committed to increased use of renewable energy sources for electricity generation. Renewable energy is also a response aimed at advancing economic and social development through the creation of both sector-specific jobs, and jobs in economic sectors that can be sustained by the additional feed-in of electricity to the grid from renewable sources of electricity generation.

In addition to reducing the emission of greenhouse gases, the use of PV technology avoids the high levels of water consumption associated with coal-based electricity generation. This is a benefit that must be considered in the context of Eskom's current consumption of approximately 2% of South Africa's total fresh water resources. Accelerated climate change has the potential to impact on the availability and quantity of water in South Africa, with decreases in summer rainfall predicted in the interior and increasing instances of droughts and floods predicted for the country in general. This creates a risk for the longevity in electricity generation that is water-dependent. By

comparison, solar energy projects have no direct water demand during operations, except for periodic washing of solar panels. This reduces the demand on South Africa's water resources, while avoiding the risk of uncertainty in water supply, attributable to climate change effects.

On a provincial level, the Northern Cape Province is currently facing considerable constraints in the availability and stability of electricity supply. This is a consequence of South Africa's electricity generation and supply system being overstretched, and the reliance of the Northern Cape, as many other South African provinces, on the import of power to service its energy needs. The development of solar energy is important for South Africa to reduce its overall environmental footprint from power generation (including externality costs), and thereby to steer the country on a pathway towards sustainability.

The Integrated Resource Plan for South Africa for the period 2010 to 2030 was released by government in 2010, and an updated report was published in 2013, which proposes to secure 17 800 MW of renewable energy capacity by 2030 (including wind, solar and other energy sources). In August 2011, the Department of Energy (DOE) launched the REIPPPP and invited potential IPPs to submit proposals for the financing, construction, operation and maintenance of the first 3 725 MW of onshore wind, solar thermal, solar photovoltaic, biomass, biogas, landfill gas or small hydropower projects. On 18 August 2015, an additional procurement target of 6300 MW to be generated from renewable energy sources was added to the REIPPPP for the years 2021 - 2025, as published in Government Gazette 39111. The additional target allocated for solar PV energy is 2200 MW.

In terms of the REIPPPP, the submitted proposals are then evaluated. Currently, the two main evaluation criteria for compliant proposals are price and economic development with a point allocation of 70/30 (DOE, 2013), with other selection criteria including technical feasibility and grid connectivity, environmental acceptability, black economic empowerment, community development, and local economic and manufacturing propositions. The bidders whose responses rank the highest (according to the aforementioned criteria) will have the greatest potential to be appointed as "Preferred Bidders" by the DOE. The first procurement phase of the DOE's REIPPPP includes five bidding windows. Scatec Solar intends to bid these projects in the 2016 bidding process (i.e. Round 5) to be potentially selected as an IPP. Additional information regarding the project contextualisation is provided in Chapters 2 and 5 of this Scoping Report.

1.2.1. Need and Desirability

It is an important requirement in the EIA Process to review the need and desirability of the proposed project. Draft guidelines on Need and Desirability were published in the Government Gazette of 5 October 2012, for comment. These draft guidelines list specific questions to determine need and desirability of proposed developments. This checklist is a useful tool in addressing specific questions relating to the need and desirability of a project and assists in explaining that need and desirability at the provincial and local context. In addition, the Western Cape Department of Environmental Affairs and Development Planning (DEADP) also published a Guideline on Need and Desirability in 2010. The DEADP Guideline (2010) states that the essential aim of investigating the need and desirability of a proposed project revolves around determining suitability (i.e. is the activity proposed in the right location for the suggested land-use/activity) and timing (i.e. is it the right time to develop a given activity?). DEADP describes need and desirability as components of the "wise use of land", where need refers to time, and desirability to place. In other words, need and desirability answer the question of whether the activity is being proposed at the right time and in the right place. Table 1.1 includes a list of questions based on the DEADP 2010 Guideline to determine the need and desirability of the proposed project.

Table 1.1: DEADP list of 14 questions to determine the “Need and Desirability” of a proposed project - Kenhardt PV 1

NEED
<p>1. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved Spatial Development Framework (SDF) agreed to by the relevant environmental authority? (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP).</p> <p>Answer: Yes</p> <p>Justification: The !Kheis Municipality Draft Integrated Development Plan (IDP) (2012 - 2017 and 2015 - 2019) states that an opportunity exists to utilise solar energy more widely and lessen the dependence on wood and fire. This opportunity has been identified because not all people within the municipal area have access to electricity. Even though this solar facility will not provide the municipality directly with electricity, the energy produced by the facility will feed into the national grid. Furthermore, the DEA have commissioned a Strategic Environmental Assessment (SEA) to identify the areas in South Africa that are of strategic importance for Wind and Solar PV development. The SEA aims to identify strategic geographical areas best suited for the roll-out of large scale wind and solar PV energy projects, referred to as Renewable Energy Development Zones (REDZs). The proposed solar facility falls within one of the potential eight REDZ areas. Therefore, should the REDZ be established and renewable projects operate within these areas, Eskom may be able to unlock funding to proactively construct grid infrastructure to facilitate generation capacity from these areas. This will mean that the municipality will also benefit from these upgrades and potentially alleviate the electrification backlogs present in the area.</p> <p>One of the priority issues identified within the !Kheis Municipality IDP (2012 - 2017 and 2015 - 2019) is the low levels of skilled people, as well as high levels of poverty and unemployment. The IDP (2012 - 2017 and 2015 - 2019) states that the objective to resolve this issue is to create an environment whereby the local community is empowered through capacity building and skills development (particularly for the youth). The proposed project will create job opportunities and economic spin offs during the construction and operational phases (if an EA is granted by the DEA). It is estimated that between 90 and 150 skilled and 400 and 460 unskilled employment opportunities will be created during the construction phase. During the operational phase, approximately 20 skilled and 40 unskilled employment opportunities will be created over the 20 year lifespan of the proposed facility. It should however be noted that employment during the construction phase will be temporary, whilst being long-term during the operational phase.</p> <p>Therefore, the proposed solar energy facility would help to address the need for increased electricity supply while also providing advanced skills transfer and training to the local communities and creating contractual and permanent employment in the area.</p>
<p>2. Should development, or if applicable, expansion of the town/area concerned in terms of this land use (associated with the activity being applied for) occur here at this point in time?</p> <p>Answer: Yes</p> <p>Justification: As stated above, there is a great need in the area for electricity and grid upgrades. In addition to this, the Northern Cape has a very high solar resource availability which provides the province with an opportunity for the construction and operation of Solar Renewable projects in the area. The need for job opportunities and electricity necessitates that these types of projects be undertaken in the area. The preferred project site is currently being used for agricultural purposes, predominantly grazing. Should the proposed Kenhardt PV 1, PV 2 and PV 3 projects proceed, approximately 750 ha of the land will be collectively developed on and it is not expected that this will significantly threaten the agricultural activities present on site. As noted in Section 1.4 of this Chapter, a Soils and Agricultural Potential Study will be undertaken during the EIA Phase in order to determine the impact of the proposed project in terms of the land use and agricultural potential.</p>

3. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate).

Answer: Yes

Justification: South Africa has a high level of Renewable Energy potential and presently has in place a generation target of 10 000 GWh of Renewable Energy. As noted above, at a national level, the DOE has set the target of having 17 800 MW of electricity generated from Renewable Energy sources contributing to the national grid by 2030 to ensure the continued uninterrupted supply of electricity. As noted above, Scatec Solar intends to submit this project for the REIPPPP and this project can therefore contribute to the IPP goals and feed into the national grid, which results in this project having national importance.

At a local level, the !Kheis Municipality Draft IDP (2012 - 2017 and 2015 - 2019) states that an opportunity exists to utilise solar energy more widely (especially in the remote areas of the municipality) and lessen the dependence on wood and fire. This opportunity has been identified because not all people within the municipal area have access to electricity. The IDP (2015 - 2019) also states that due to small communities present in sparsely populated areas, effective distribution of electricity becomes difficult in some areas. Even though this solar facility will not provide electricity to the municipality directly, the energy produced by the facility will feed into the national grid. In addition, on a local level, the project will contribute towards job creation which is needed within the area.

4. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?

Answer: Partially

Justification: Some services are currently available to cater for the proposed development, however services to support the proposed facility will need to be designed and constructed as well. As mentioned above, the Eskom Nieuwehoop Substation (which is currently being constructed and is located approximately 3 km from the project site) will be used for the proposed project. An EA for the construction of the 400/50 50 kV Eskom Nieuwehoop Substation was granted to Eskom Holdings SOC Limited on 21 February 2011 by the DEA (Reference Number: 12/12/20/1166). In addition, an EA (DEA Reference Number: 12/12/20/2606; NEAS Reference Number: DEA/EIA/0000785/2011), dated 14 February 2014, was also granted to Eskom Holdings SOC Limited to construct, inter alia, the following within the existing development footprint of the Nieuwehoop Substation:

- 2 x 400 kV transformer feeder bay;
- A 400 / 132 kV transformer;
- 132 kV busbar;
- 400 / 132 kV 500 MVA x 3 transformers; and
- 8 x 132 kV feeder bays and associated lines.

Furthermore, existing roads (such as a private Transnet Service Road or an unnamed farm road) will be used to gain access to the preferred site. The Transnet Service Road can be accessed from the R27 and the farm road can be accessed from the R383 Regional Road also via the R27 National Road. An internal gravel road may also be constructed from either the Transnet Service Road or the unnamed farm road.

It terms of additional services, stormwater channels and water pipelines (for panel cleaning purposes) may be constructed as part of the proposed project. However, existing municipal services for the handling of waste, provision of water and sewage handling are expected to be used for the proposed project. Confirmation of the availability of the services will be obtained during the Scoping and EIA Process.

5. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)?

Answer: No

Justification: There is no anticipated negative impact on municipal infrastructure planning (no clash of priority, and/or placement) as additional infrastructure required to maintain the proposed facility would be provided and maintained by the Applicant. The activity is furthermore proposed on agricultural land with little or no existing and planned infrastructure. The opportunity cost of constructing the proposed solar energy facility might increase the viability of agricultural productivity due to financial advantage of having a solar facility on agricultural property (i.e. farmers will receive payments for lease of the property per quarter or year). The opportunity cost of not constructing the proposed facility would be the maintenance of the current status quo, which is marginal agriculture.

6. Is this project part of a national programme to address an issue of national concern or importance?

Answer: Yes

Justification: The National Integrated Resource Plan for Electricity (IRP2) (2011) suggests that 42% of national energy supply must come from renewable energy sources between 2010 and 2030.

DESIRABILITY

7. Is the development the best practicable environmental option for this land/site?

Answer: To be confirmed during the EIA Phase.

Justification: It would be premature to decide on the environmental practicability of the proposed development prior to the completion of the impact assessment phase of this EIA Process. However, at first glance, the long-term viability of agriculture (i.e. the existing land-use) on the proposed project site seems to be marginal and subject to global economic and climatic change variables which directly impacts on its practicability. The proposed solar energy facility would however be more robust in terms of economic viability and profitability while also being largely uninfluenced by climate change variables. The proposed project would also provide the farm owner with additional income by way of lease agreements (as explained above) and may also contribute to local socio-economic upliftment through job creation.

8. Would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF as agreed to by the relevant authorities?

Answer: No

Justification: The proposed activity does not compromise any of the objectives set within the !Kheis Municipality Draft IDP (2012 - 2017 and 2015 - 2019). The proposed project will also be supportive of the IDP's objective of creating more job opportunities. The proposed solar energy facility will assist in local job creation during the construction and operation phases of the project (if an EA is granted by the DEA). However, as noted above, employment opportunities will be temporary during the construction phase and long-term during the operational phase as the plant is expected to be operational for 20 years.

9. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?

Answer: To be confirmed during the EIA Phase.

Justification: It is not expected that the approval of the proposed project would compromise the integrity of the existing environmental management priorities for the area. However, this will be determined during the EIA Phase of the proposed project. Furthermore, the proposed project will require mitigation of potential negative environmental impacts during the construction, operational and potential decommissioning phases. To this end, an Environmental Management Programme (EMPr) will be compiled for the proposed project to ensure that all potential negative impacts identified are suitably managed and mitigated, and potential positive impacts are enhanced.

As noted above, the preferred project site is currently being used for agricultural purposes, predominantly grazing. It should be noted that the existing livestock grazing is expected to continue outside the fenced solar facility and potentially inside once the internal project footprint has been rehabilitated.

Section 2.1.4 of the Siyanda District Municipality (now known as ZF Mgcawu District Municipality) Environmental Management Framework states that “in the year 2000, the utilization of groundwater in the area was approximately in balance with a sustainable yield from this source. No significant potential for further development exists. Over-exploitation of the groundwater has not been experienced in the EMF area”. Therefore, the proposal to use groundwater for water supply would need to be carefully considered and assessed to ensure that borehole abstraction delivers a sustainable yield. The feasibility and sustainability of using groundwater supply for the project will be determined as part of the Geohydrological Assessment to be conducted during the EIA Phase of the project (as noted in Section 1.4 of this chapter).

10. Do location factors favour this land use (associated with the activity applied for) at this place? (this relates to the contextualisation of the proposed land use on this site within its broader context)

Answer: Yes

Justification: As discussed above and in Chapter 5 of this Scoping Report, the solar resource of this area is high, which makes it a very favourable location for the proposed solar facility. In terms of land-use and sense of place, the facility will be located on marginal agricultural land. Although the solar facility proposed on the property is deemed a commercial land-use and not for agricultural purposes, only an estimated 250 ha of the total property area will be developed on for this specific proposed project (i.e. Kenhardt PV 1). However, if the proposed Kenhardt PV 1, PV 2 and PV 3 projects proceed, approximately 750 ha of the land on the remaining extent of Onder Rugzeer Farm 168 will be collectively developed on. The remaining extent of Onder Rugzeer Farm 168 extends approximately **5552 ha** in area and if all three solar PV projects proceed, only 13.5 % of the total farm area will be developed on. The landscape of the immediate adjacent area is already impacted by the ore freight railway line and will become even more industrialised by the Eskom Nieuwehoop substation and high voltage transmission lines. Furthermore, due to the rural location of the proposed facility, the visual intrusion is expected to be low. The visual impact and considerations will be further assessed as part of the Visual Impact Assessment to be undertaken as part of the EIA Phase of this project (as noted in Section 1.4 of this chapter).

11. How will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?

Answer: To be confirmed during the EIA Phase, however it is largely neutral in terms of natural sensitivity and potentially negative in terms of cultural areas.

Justification: The impact on sensitive natural areas would be limited (however, this would need to be confirmed and determined as part of the EIA Phase of the proposed project). The impact of the proposed project on archaeology and palaeontology will be assessed as part of the EIA Phase (as noted in Section 1.4 of this chapter).

As noted above, an EMPr will be compiled for the proposed project to ensure that all potential negative impacts identified are suitably managed and mitigated, and potential positive impacts are enhanced. The impact on the sense of place is difficult to predict and would potentially be ambiguous. This is due to the subjective nature of perceptions regarding the relative attraction or disturbance of the solar facility in a rural landscape. The visual impact and considerations will be further assessed as part of the Visual Impact Assessment to be undertaken as part of the EIA Phase of this project (as noted in Section 1.4 of this chapter). An environmental sensitivity map will also be created during the EIA Phase based on the input obtained from the various specialist studies (as noted in Section 1.4 of this chapter). These sensitive features will be identified so that they can be avoided by the proposed layout.

12. How will the development impact on people's health and wellbeing (e.g. in terms of noise, odours, visual character and sense of place, etc.)?

Answer: To be confirmed during the EIA Phase.

Justification:

- **Health and Wellbeing:** The impacts on health and wellbeing are expected to be minimal as the project is taking place within a sparsely populated region. Dust may be generated during the construction phase, however it is expected to be of a short-term duration and insignificant. However, where applicable, mitigation measures relating to potential impacts on the health and wellbeing of people (such as construction staff, farm workers, construction staff at the Eskom Nieuwehoop Substation and the operational staff of the ore railway line) will be included in the EMP, which will be completed during the EIA Phase.
- **Noise:** During the construction phase, noise may be generated as a result of the operation of equipment, vehicles and machinery, the transportation of construction materials and staff to and from site, the establishment of site construction areas, as well as general construction activities. However, the noise levels and impacts will be short-term and are not expected to be significant during the construction phase. During the operational phase, the proposed solar facility would not generate any noise. Mitigation measures will be provided to reduce the negative noise impacts during the construction phase.
- **Odours:** These will be minimal during the construction phase and non-existent during the operational phase.
- **Visual Character and Sense of Place:** In terms of visual character and sense of place, the visual landscape and the agricultural landscape has been altered by the ore freight railway line. The site is expected to become even more industrialised by the Eskom Nieuwehoop Substation and high voltage transmission lines. This will be assessed in the Visual Impact Assessment to be undertaken as part of the EIA Phase of this project (as noted in Section 1.4 of this chapter).

Notwithstanding the above, the socio-economic benefits likely to result from the proposed project (e.g. creation of jobs and regional economic development) would most likely outweigh the issues mentioned above.

13. Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?

Answer: No

Justification: Solar energy facilities can be dismantled and completely removed from the site leased for the development and do not permanently prevent alternative land-uses on the same land parcel. Based on material and socio-economic terms, and measured to the value of the best alternative that is not chosen, the proposed project will result in positive opportunity costs.

14. Will the proposed land use result in unacceptable cumulative impacts?

Answer: To be confirmed during the EIA Phase.

Justification: The potential cumulative impacts resulting from the proposed project can only be objectively determined at the end of the EIA Process. These will be assessed as part of the EIA for this project.

1.3. Requirements for an EIA

As noted above, in terms of the EIA Regulations promulgated under Chapter 5 of the NEMA published in GN R982, R983, R984 and R985 on 4 December 2014 and enforced on 8 December 2014, a full Scoping and EIA Process is required for the proposed project. The need for the full Scoping and EIA is triggered by, amongst others, the inclusion of Activity 1 listed in GN R984 (Listing Notice 2):

- “The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs within an urban area”.

Chapter 4 of this Scoping Report contains the detailed list of activities contained in R983 and R984 which may be triggered by the various project components and thus form part of this Scoping and EIA Process. Given that energy related projects have been elevated to national strategic importance in terms of the EA Process, the proposed project requires authorisation from the National DEA, acting in consultation with other spheres of government.

The purpose of the EIA is to identify, assess and report on any potential impacts the proposed project, if implemented, may have on the receiving environment. The environmental assessment therefore needs to show the Competent Authority, the DEA; and the project proponent, Scatec Solar, what the consequences of their choices will be in terms of impacts on the biophysical and socio-economic environment and how such impacts can be, as far as possible, enhanced or mitigated and managed as the case may be.

1.4. EIA Team

As previously noted, the CSIR has been appointed by Scatec Solar to undertake the EIA required for the proposed project. Public participation forms an integral part of the Environmental Assessment Process and assists in identifying issues and possible alternatives to be considered during the EIA Process. The CSIR is undertaking the PPP for this EIA. Details on the PPP are included in Chapter 4 of this Scoping Report.

The EIA team which is involved in this Scoping and EIA Process is listed in Table 1.2 below. This team includes a number of specialists which have either been involved to date, or are planned to provide inputs during the EIA Process.

Table 1.2: The EIA Management Team

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN
Environmental Assessment Practitioners		
Paul Lochner	CSIR	Technical Advisor and Quality Assurance (EAPSA) Certified
Surina Laurie	CSIR	Project Leader (<i>Pr. Sci. Nat.</i>)
Rohaida Abed	CSIR	Project Manager (<i>Pr. Sci. Nat.</i>)
Specialists		
Simon Bundy	Sustainable Development Projects cc	Ecological Impact Assessment (including Terrestrial Ecology, Aquatic Ecology and Avifauna)
Henry Holland	Private	Visual Impact Assessment
Dr. Jayson Orton	ASHA Consulting (Pty) Ltd	Heritage Impact Assessment (Archaeology and Cultural Landscape)
Dr. John Almond	Natura Viva cc	Desktop Palaeontological Impact Assessment
Julian Conrad	GEOSS	Geohydrological Assessment
Johann Lanz	Private	Soils and Agricultural Potential Assessment
Rudolph du Toit	CSIR	Social Impact Assessment

1.5. Details and Expertise of the Environmental Assessment Practitioners

Over the past 30 years the CSIR has been involved in a multitude of projects across Africa and South Africa, with experience in 32 sub-Saharan African and Indian Ocean Island countries. The Environmental Management Services (EMS) group within the CSIR has been involved in the management and execution of numerous environmental assessment and management studies in more than 15 countries in Africa, as well as the Middle East, South America and Russia. These studies have included both public and private sector clients. Consequently, the CSIR EMS team offers a wealth of experience and appreciation of the environmental and social priorities and national policies and regulations in South Africa.

The EIA Project Team is being led by Surina Laurie, who will be supported by the Project Manager, Rohaida Abed. Paul Lochner will act as Technical Advisor for the proposed project. Refer to Appendix A of this Scoping Report for the Curriculum Vitae of the EAPs. Appendix B of this Scoping Report includes a declaration of and affirmation by the EAP as required by the 2014 EIA Regulations.

Paul Lochner - Paul has 22 years of experience in environmental assessment and management studies, primarily in the leadership and integration functions. This has included SEAs, EIAs and Environmental Management Plans. In July 2003, he obtained certification as a registered EAP with the Interim Certification Board for EAPs of South Africa (EAPSA). He has been extensively involved in renewable energy projects over the last few years. He was the Project Leader for the Electrawinds Basic Assessment (BA) and EIA projects at the Coega Industrial Development Zone (IDZ), and was the Project Leader for the EIA for the Mulilo Kouga wind energy project (Phase 1) at Jeffreys Bay. Phase 1 of this project was granted EA by the Eastern Cape Government in March 2009. He was part of the CSIR team that prepared the EIA and EMP for the Eskom wind energy demonstration facility at Klipheuwel (Western Cape), which was approved by the Western Cape provincial government. He is currently the Project Leader for the SEA for the location and placement of wind and solar energy projects in South Africa. He has also recently led EIAs for Solar PV projects in the Free State and Northern Cape for Mainstream Renewable Energy, Solaire Direct and Mulilo Renewable Project Developments. He has also authored several Guidelines for national and provincial government, such as the Guideline for EMPs published in 2005 by the Western Cape government.

Surina Laurie - Surina is a Senior EAP in the EMS group of the CSIR and she has a Masters degree in Environmental Management and is a Registered Professional Natural Scientist (Registration Number: 400033/15) with the South African Council for Natural Scientific Professions (SACNASP). She has more than 4 years of experience in environmental assessment and management. Surina has experience in the management and integration of various types of environmental assessments in South Africa for various sectors, including renewable energy, industry and tourism. She has also been part of advisory teams advising on financing, real estate, corporate, construction, environmental and regulatory aspects for various sponsors, developers and lenders during the DOE's first and second bidding windows in 2012 and 2013. Surina is currently undertaking several Solar PV EIAs in the Northern Cape and Free State. Surina is the Project Manager for the proposed (adjacent) Nieuwehoop Solar Development EIA project, which currently underway.

Rohaida Abed - Rohaida is a Junior EAP in the EMS group of the CSIR and she has a Masters degree in Environmental Science and is a Registered Professional Natural Scientist (Registration Number: 400247/14) with the SACNASP. She has experience in the Environmental Management field, and has been involved in various transport infrastructure related projects as an Environmental Control Officer. She has also been involved in EIAs relating to Port infrastructure and Bulk Liquid Storage facilities in the capacity of Project Manager.

1.6. Objectives for this Scoping Report

The Scoping Phase of the EIA refers to the process of determining the spatial and temporal boundaries for the EIA. In broad terms, the objectives of the Scoping Process in terms of the 2014 NEMA EIA Regulations (GN R982) are to:

- Confirm the process to be followed and opportunities for stakeholder engagement;
- Clarify the project scope to be covered;
- Identify and confirm the preferred activity and technology alternative;
- Identify and confirm the preferred site for the preferred activity;
- Identify the key issues to be addressed in the impact assessment phase and the approach to be followed in addressing these issues; and
- Confirm the level of assessment to be undertaken during the impact assessment

This is achieved through parallel initiatives of consulting with:

- The lead authorities involved in the decision-making for this EIA application;
- The public to ensure that local issues are well understood; and
- The EIA specialist team to ensure that technical issues are identified.

The Scoping Process is supported by a review of relevant background literature on the local area. Through this comprehensive process, the environmental assessment can identify and focus on key issues requiring assessment.

The primary objective of the Scoping Report is to present key stakeholders (including affected organs of state) with an overview of the project and key issues that require assessment in the EIA Phase and allow the opportunity for the identification of additional issues that may require assessment.

Issues raised thus far during the Scoping Process have been captured in the Issues and Responses Trail in Chapter 7 of this Scoping Report. Issues raised in response to this Scoping Report (currently being released for a 30-day comment period) will be captured in the Issues and Responses Trail and will be included in the finalised Scoping Report and Plan of Study for EIA, which will be submitted to the National DEA for decision-making (i.e. approval or rejection) in line with Regulation 21 (1) of GN R982. This approval is planned to mark the end of the Scoping Phase after which the EIA Process moves into the impact assessment and reporting phase.

In terms of legal requirements, a crucial objective of the Scoping Report is to satisfy the requirements of Appendix 2 of the 2014 NEMA EIA Regulations (as noted in Regulation 21 (3) of the GN R982). This section regulates and prescribes the content of the Scoping Report and specifies the type of supporting information that must accompany the submission of the Scoping Report to the authorities. An overview of where the requirements of Appendix 2 of the 2014 NEMA EIA Regulations are addressed in this Scoping Report is presented in Table 1.3.

Furthermore, this process is designed to satisfy the requirements of Regulations 41, 42, 43 and 44 of the 2014 NEMA EIA Regulations relating to the PPP and, specifically, the registration of and submissions from I&APs.

Table 1.3: Requirements of a Scoping Report as defined in terms of Appendix 2 of GN R982

Section of the EIA Regulations	Requirements for a Scoping Report in terms of Appendix 2 of the 2014 NEMA EIA Regulations (GN R982)	Location in this Scoping Report
Appendix 2 - (2)(a)	Details of - i. the EAP who prepared the report; and ii. the expertise of the EAP, including a curriculum vitae;	Chapter 1 and Appendix A
Appendix 2 - (2)(b)	The location of the activity, including - i. the 21 digit Surveyor General code of each cadastral land parcel; ii. where available, the physical address and farm name; iii. where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Chapter 2 and Chapter 3
Appendix 2 - (2)(c)	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is - i. a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or ii. on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Chapter 2 and Chapter 3
Appendix 2 - (2)(d)	A description of the scope of the proposed activity, including - i. all listed and specified activities triggered; ii. a description of the activities to be undertaken, including associated structures and infrastructure;	Chapter 2 and Chapter 4
Appendix 2 - (2)(e)	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	Chapter 4
Appendix 2 - (2)(f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Chapter 1, Chapter 2 and Chapter 5
Appendix 2 - (2)(h)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including - i. details of all the alternatives considered; ii. details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; iii. a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; iv. the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; v. the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts - (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; vi. the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; vii. positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; viii. the possible mitigation measures that could be applied and level of residual risk; ix. the outcome of the site selection matrix; x. if no alternatives, including alternative locations for the activity were	Chapter 4, Chapter 5, Chapter 6 and Chapter 7

Section of the EIA Regulations	Requirements for a Scoping Report in terms of Appendix 2 of the 2014 NEMA EIA Regulations (GN R982)	Location in this Scoping Report
	<ul style="list-style-type: none"> xi. investigated, the motivation for not considering such and a concluding statement indicating the preferred alternatives, including preferred location of the activity; 	
Appendix 2 - (2)(i)	<p>A plan of study for undertaking the environmental impact assessment process to be undertaken, including -</p> <ul style="list-style-type: none"> i. a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity; ii. a description of the aspects to be assessed as part of the environmental impact assessment process; iii. aspects to be assessed by specialists; iv. a description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists; v. a description of the proposed method of assessing duration and significance; vi. an indication of the stages at which the competent authority will be consulted; vii. particulars of the public participation process that will be conducted during the environmental impact assessment process; and viii. a description of the tasks that will be undertaken as part of the environmental impact assessment process; ix. identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored. 	Chapter 8
Appendix 2 - (2)(j)	<p>An undertaking under oath or affirmation by the EAP in relation to -</p> <ul style="list-style-type: none"> i. the correctness of the information provided in the report; ii. the inclusion of comments and inputs from stakeholders and interested and affected parties; and iii. any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties; 	Appendix B
Appendix 2 - (2)(k)	<p>An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;</p>	Appendix B
Appendix 2 - (2)(l)	<p>Where applicable, any specific information required by the competent authority;</p>	Not applicable at this stage
Appendix 2 - (2)(m)	<p>Any other matter required in terms of section 24(4)(a) and (b) of the Act.</p>	Not applicable at this stage

SCOPING REPORT



CHAPTER 2: Project Description

Scoping and Environmental Impact Assessment for the Proposed Development of a 75 MW Solar Photovoltaic Facility (KENHARDT PV 1) on the remaining extent of Onder Rugzeer Farm 168, north-east of Kenhardt, Northern Cape Province

contents

2	PROJECT DESCRIPTION	2-3
2.1	Site Selection	2-3
2.2	Technology Selection	2-3
2.2.1	<i>Solar Panel Type</i>	2-3
2.2.2	<i>Mounting System</i>	2-4
2.3	Key Components of the Proposed Solar Energy Facility	2-4
2.3.1	<i>Solar Field</i>	2-7
2.3.1.1	Solar Arrays	2-7
2.3.1.2	Building Infrastructure	2-8
2.3.2	<i>Associated Infrastructure</i>	2-8
2.3.2.1	Electrical Infrastructure	2-8
2.3.2.2	Roads	2-9
2.3.2.3	Fencing	2-9
2.3.2.4	Panel Maintenance and Cleaning	2-9
2.3.2.5	Stormwater Channels and Water Pipelines	2-9
2.4	Overview of Project Development Cycle	2-10
2.4.1	<i>Construction Phase</i>	2-10
2.4.2	<i>Operational Phase</i>	2-10
2.4.3	<i>Decommissioning Phase</i>	2-11

tables

Table 2.1:	Co-ordinates of the Corner Points of the Preferred Project Site	2-5
------------	---	-----

figures

Figure 2.1: Solar panel technologies: CPV (left), CSP (middle) and conventional PV (right)	2-4
Figure 2.2: Proposed Locality of the Kenhardt PV 1 project (including the alternative site and site access)	2-6
Figure 2.3: Components of the Proposed PV Installation (Source: Go Greena, 2013)	2-7
Figure 2.4: PV Technology	2-8



2 PROJECT DESCRIPTION

This chapter provides an overview of the conceptual project design and an overview of the site and technology selection process (as provided by Scatec Solar) for the proposed 75 MW Solar PV facility, referred to as Kenhardt PV 1.

The purpose of this chapter is to present sufficient project information to inform the EIA Process in terms of design parameters applicable to the project. It is important to note that the project description details are preliminary at this stage and it is likely that some of the details presented herein may change during the detailed design phase and upon further investigations (including the findings and input of the specialist studies conducted during the EIA Phase of the proposed project).

2.1 Site Selection

Additional information regarding the site selection process is provided in Chapter 5 of this Scoping Report. The preferred and alternative sites were selected based on national level considerations (high solar radiation in the Northern Cape) and the fact that the proposed site currently falls within the REDZ 7. On a site specific level, the site was deemed suitable due to all the site selection factors (such as land availability, distance to the national grid, site accessibility, topography, fire risk, current land use and landowner willingness) being favourable.

2.2 Technology Selection

The different options for solar panel types and mounting systems that were investigated by Scatec Solar and deemed feasible for the solar facility are discussed below. The preferred mounting system to be constructed on site will be determined closer to the detailed design phase and after taking into consideration the economic viability, water requirements, land requirements, efficiency and potential environmental impacts.

2.2.1 Solar Panel Type

The following three solar panel types were considered for the proposed facility:

- Concentrated PV (CPV);
- Concentrated Solar Power (CSP); and
- Conventional PV solar cells.

Information gathered through previous EIAs, as well as the recent technology advances informed this investigation. The different technologies are shown in Figure 2.1 below.

CPV technology makes use of optics, such as lenses or curved mirrors, to concentrate sunlight onto a small area of solar PV cells to generate electricity. This technology type has the potential to be more cost effective than conventional PV solar cells in that it requires a smaller area of PV material to achieve the same energy output. However, it does require active solar tracking to be effective. Similar to CPV technology, CSPs use mirrors or lenses to concentrate sunlight onto a small area to generate electricity directly via a heat engine, e.g. a steam turbine.

Conventional PV technology on the other hand, does not make use of any mirrors or lenses and generates electricity by converting solar radiation energy into a DC which then needs to be converted to an AC to connect to the grid. In terms of water usage, conventional PV and CPV technologies require less water (i.e. 19 litres of water per MW of electricity produced per hour) than the CSP system which needs approximately 3 420 litres of water per MW of electricity produced per hour during the operational period.



Figure 2.1: Solar panel technologies: CPV (left), CSP (middle) and conventional PV (right)¹

Due to the scarcity of water in the proposed project area, and the large volume of water required for the CSP system, as well as the tracking requirements for CPV, only conventional PV technology will be considered for the proposed solar facility.

2.2.2 Mounting System

Solar panels can be mounted in various ways to ensure maximum exposure of the PV panels to sunlight. The four main mounting systems considered as part of the EIA are:

- Single axis tracking systems;
- Fixed axis tracking systems;
- Dual axis tracking systems; and
- Fixed tilt mounting structures.

In a fixed axis tracking system, the PV panels are installed at a set tilt facing north and cannot move, whereas in a single axis tracking system the panels follow the sun (i.e. east to west) to ensure maximum exposure to sunlight. In a dual axis tracking system, the PV panels can follow the sun from east to west, as well as follow the sun's altitude (which results in an optimal angle of radiation onto the panel (Vermaak, 2014)). Dual axis tracking systems can therefore follow the sun throughout the day both horizontally and vertically. The type of mounting system will be confirmed during the detailed engineering phase.

2.3 Key Components of the Proposed Solar Energy Facility

A summary of the key components of the proposed project is described below. It is important to note at the outset that the exact specifications of the proposed project components will be determined during the detailed engineering phase.

This project is being developed to have a generation capacity of 75 MW AC and up to 100 MW DC. As mentioned in Chapter 1 of this Scoping Report, once a Power Purchase Agreement (PPA) is awarded, the proposed facility will generate electricity for a minimum period of 20 years. The property on which the facility is to be constructed will be leased by Scatec Solar from the property owner for the life span of the project. The preferred site includes approximately 450 ha of land. Due to the fact that this project only requires 250 ha of land, there is scope to avoid major environmental constraints through the final design of the facility.

As discussed above, this project will utilise PV technology to generate electricity. The two main components of the project will consist of the solar field (solar panels and building infrastructure) and the associated infrastructure. The technical components forming part of the solar facility are detailed discussed in Sections 2.3.1 and 2.3.2 below.

¹ Sources: <http://cpvconsortium.org/>, <http://www.crossover.tractebel-engineering-gdfsuez.com/crossover3/renewable-energy-hits-south-africa/> and <http://cleantechnica.com/2010/05/13/how-to-get-25-of-world-electricity-from-solar-energy-by-2050>

The solar facility will consist of the following components:

- **Solar Field**
 - Solar Arrays:
 - PV Modules;
 - Single Axis Tracking structures (aligned north-south), Fixed Axis Tracking (aligned east-west), Dual Axis Tracking (aligned east-west and north-south) or Fixed Tilt Mounting Structure;
 - Solar module mounting structures comprised of galvanised steel and aluminium; and
 - Foundations which will likely be drilled and concreted into the ground.
 - Building Infrastructure:
 - Offices;
 - Operational and maintenance control centre;
 - Warehouse/workshop;
 - Ablution facilities;
 - Converter station;
 - On-site substation building; and
 - Guard House.
- **Associated Infrastructure**
 - 132 kV overhead transmission line (which will be subject to a separate Basic Assessment Process, referred to as Kenhardt PV 1 - Transmission Line);
 - Associated electrical infrastructure at the Eskom Nieuwehoop Substation (including but not limited to an additional feeder bay, Busbars, transformer bay and extension to the platform at the substation) (which will be subject to a separate Basic Assessment Process, referred to as Kenhardt PV 1 - Transmission Line);
 - On-site substation;
 - 33 kV internal transmission lines/underground cables;
 - Underground low voltage cables or cable trays;
 - Access roads;
 - Internal gravel roads;
 - Fencing;
 - Panel maintenance and cleaning area;
 - Stormwater channels;
 - Water pipelines; and
 - Temporary work area during the construction phase (i.e. laydown area).

The overall locality of the proposed project, including the alternative site (referred to as “Kenhardt PV 1b”), is shown in Figure 2.2 below. As explained in Chapter 5 of this Scoping Report, only the preferred alternative site for Kenhardt PV 1 will be assessed during the EIA Phase.

As noted previously, the proposed project will take place on the remaining extent of Onder Rugzeer Farm 168 (Surveyor General 21-Digit Code: C0360000000016800000). The co-ordinates of the boundary/corner points of the preferred project site (i.e. Kenhardt PV 1) are shown in Table 2.1 below.

Table 2.1: Co-ordinates of the Corner Points of the Preferred Project Site

Point	Latitude	Longitude
A - North East	29° 09' 49.47"S	21° 18' 18.73"E
B - South West	29° 12' 58.77"S	21° 16' 24.64"E
C - South-South West	29° 13' 4.08"S	21° 16' 28.50"E
D - South	29° 11' 35.89"S	21° 17' 47.39"E
E - East	29° 10' 49.56"S	21° 18' 42.75"E

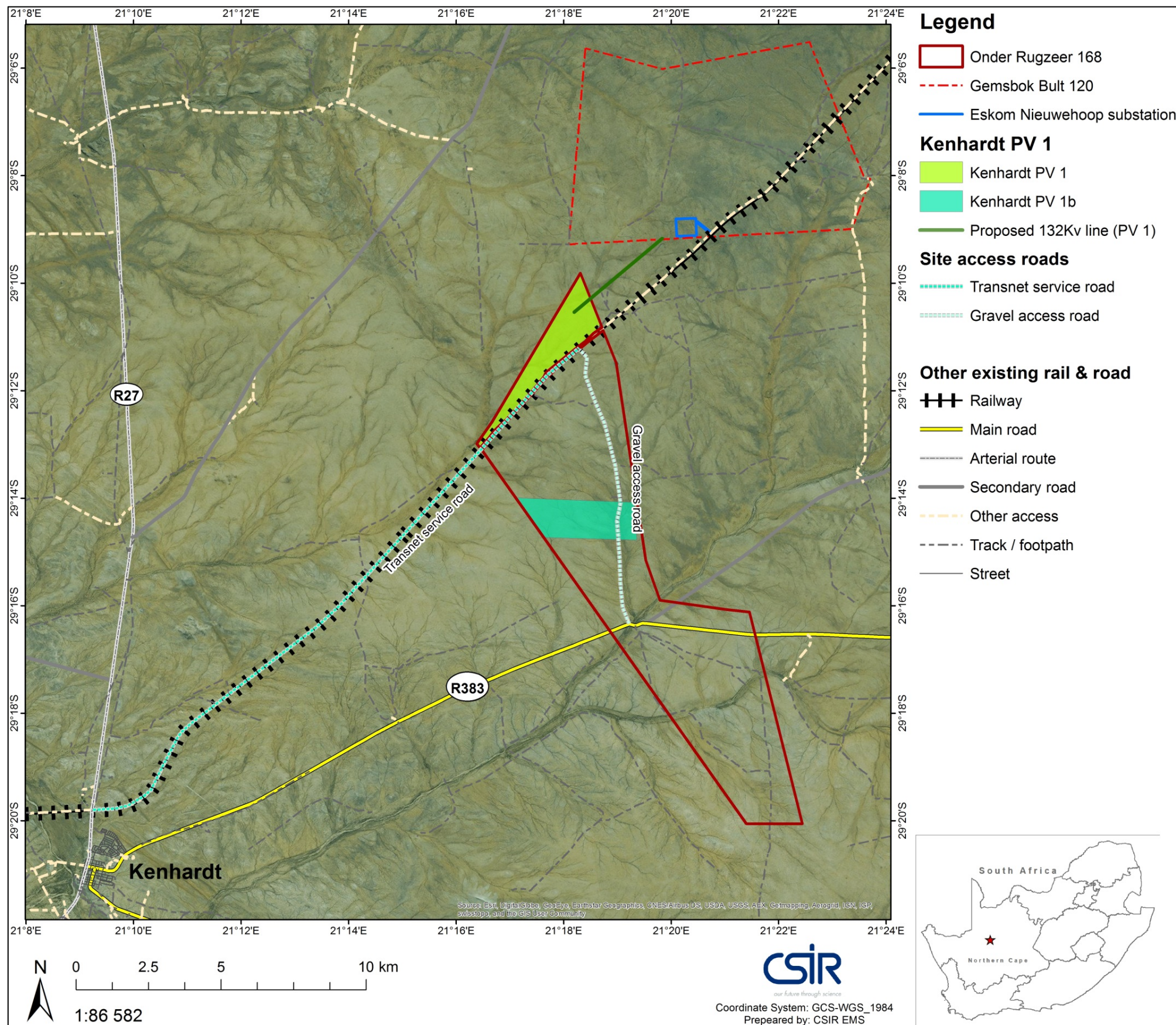


Figure 2.2: Proposed Locality of the Kenhardt PV 1 project (including the alternative site and site access)

2.3.1 Solar Field

The Solar Field will consist of the solar arrays (panels) and building infrastructure.

2.3.1.1 Solar Arrays

As noted above, the total footprint of the solar facility is estimated to be approximately 250 ha. This will include the development of the solar field including electrical infrastructure, the structure of the solar array and foundations. The exact number of solar panels arrays, confirmation of the foundation type and detailed design will follow as the development progresses.

▪ PV Modules

The smallest unit of a PV installation is a cell. A number of cells form a module, and finally a number of modules form the arrays (Figure 2.3).

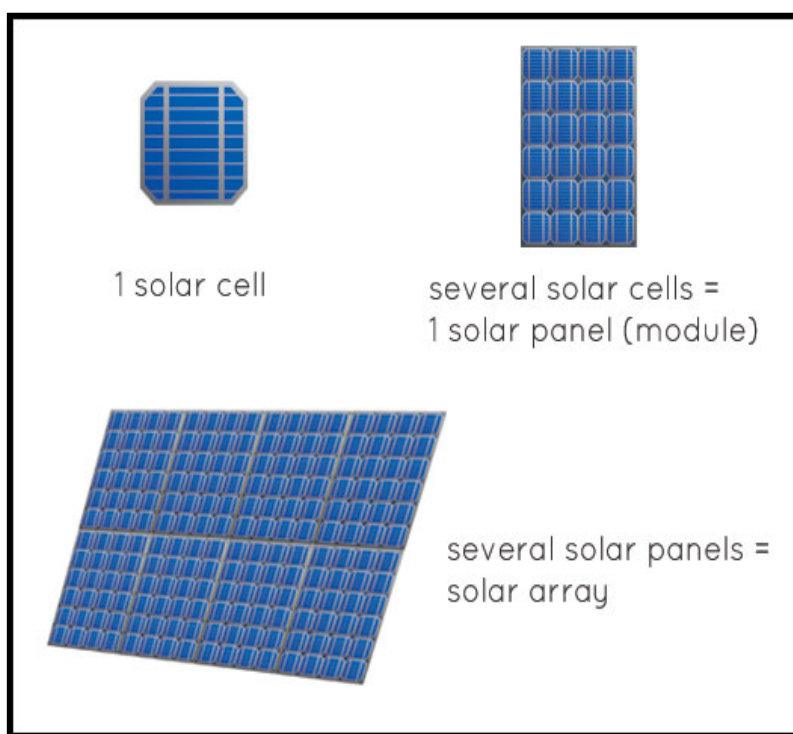


Figure 2.3: Components of the Proposed PV Installation (Source: Go Greena, 2013)

Modules are arranged into strings that form the solar field. Modules are arranged in section sizes of approximately 40 x 5 m called tables and are installed on racks which are made of aluminium or galvanised steel. The arrays and racks will be founded into the ground through either steel or concrete towers (which will be confirmed during the detailed engineering phase), as shown in Figure 2.4. The entire structure is not expected to exceed 10 m in height (measured from the ground). This system may be fixed, or may track the movement of the sun (either by adopting Fixed Axis Tracking, Single Axis Tracking, Dual Axis Tracking or Fixed Tilt Mounting Structures as explained above).

All the arrays will be wired to a converter station that converts DC into AC. Section 2.3.2.1 of this chapter provides additional detail regarding the converter station and connection thereto.



Figure 2.4: PV Technology

2.3.1.2 Building Infrastructure

The solar field will require on-site buildings, including an operational and maintenance control centre, offices, warehouse/workshop (for storage of equipment), ablution facilities, converter station, on-site substation and substation building, laydown areas and security enclosures. The on-site substation building is expected to extend approximately 12 m in height, with a maximum footprint of 20 000 m². Ablution facilities are likely to be incorporated into the office structures. The buildings will likely be of single storey design, with the largest building (i.e. Control Centre Building) unlikely to exceed 6 m in height and 500 m² plan dimensions. The buildings are required to support the functioning of the facility and to provide services to personnel that will operate and maintain the facility. The building infrastructure for both technology types will be the same. Detailed design will follow as the development progresses.

2.3.2 Associated Infrastructure

2.3.2.1 Electrical Infrastructure

As mentioned above, the solar arrays are typically connected to each other in strings, which are in turn connected to inverters that convert DC to AC. The strings will be connected to the converter station by low voltage underground (internal) DC cables or cable trays. Power from the inverter station will be collected in medium voltage transformers through underground (internal) AC cables, cable trays or AC cables which are pole-mounted depending on voltage level and site conditions.

The converter station will in turn be connected to the proposed on-site substation, via medium voltage (33 kV) underground (internal) cables or overhead lines, which will increase the voltage and transmit the power produced via a 132 kV overhead transmission line into the national grid system via the Eskom Nieuwehoop substation which is currently being constructed on the Gemsbok Bult Farm (as mentioned above). An overhead transmission line (132 kV) will be constructed for each 75 MW Solar PV Facility and is expected to extend approximately 3 km in length (between the proposed on-site substation and the Eskom Nieuwehoop Substation), with steel or concrete tower structures. Currently, Scatec Solar will implement the Self-Build option and may transfer the ownership of the line to Eskom. Therefore, the proposed electrical infrastructure, which includes the 132 kV transmission line and a collector substation, will be assessed separately as part of a Basic Assessment Process (i.e. Kenhardt PV 1 - Transmission Line).

It is important to note that all high voltage infrastructure leading up to the Point of Connection (i.e. Scatec Solar's section of the proposed collector substation) will be covered by this EIA Process (i.e. for Kenhardt PV 1). High voltage infrastructure extending from the Point of Connection (i.e. Eskom's section of the proposed collector substation) up to the line bay at the Eskom Nieuwehoop Substation may be handed over to Eskom and will be assessed separately as part of a Basic Assessment Process (i.e. Kenhardt PV 1 - Transmission Line).

As previously mentioned, a separate EA was granted to Eskom Holdings SOC Limited for the construction of the Nieuwehoop Substation on 21 February 2011 (DEA Reference Number: 12/12/20/1166).

Detailed design will follow as the development progresses.

2.3.2.2 Roads

The proposed project site can be accessed via an existing gravel road (an unnamed farm road) and the existing Transnet Service Road (private). The R27 extends from Keimoes (in the north) to Vredendal in the south. The R27 is 6 m wide and falls within a 45 m road reserve. This National Road is designed for minimum daily traffic exceeding 1000 vehicle units. The Transnet Service Road can be accessed from the R27. The existing gravel road can be accessed from the R383 Regional Road also via the R27 National Road. The Transnet Service Road and unnamed farm road are both 7-8 m wide.

Should the Transnet Service Road be considered the preferred access road, it is proposed that an internal gravel road be constructed from the road to the proposed site. This internal gravel road is not expected to exceed 6 m in width. The length of the internal gravel road will be confirmed as the location, design and layout of the facility progresses. It is understood that discussions will be held with Transnet and the Project Applicant during the Scoping and EIA Process regarding the potential use of the Transnet Road and associated specific requirements.

2.3.2.3 Fencing

For various reasons (such as security, public protection and lawful requirements), the proposed facility will be secured via the installation of boundary fencing. The fencing is planned to be approximately 2.6 m high. Access points will be managed and monitored by an appointed security service provider. The type of fencing is yet to be determined; however it may be a fully electrified option. The fencing infrastructure for both technology types will be the same. Detailed design will follow as the development progresses.

2.3.2.4 Panel Maintenance and Cleaning

The accumulation of dust on solar panels generally negatively influences the productivity of solar facilities. As such the panels require regular cleaning. Cleaning and maintenance of the panels will require water. The Project Applicant intends to make use of existing boreholes to source groundwater (if available and if suitable) for the panel cleaning process. The water will be transported from the boreholes to the facility via water pipelines (the routing of which will be provided during the EIA Phase). It is proposed that panel cleaning will take place quarterly; however this may be revised should the site conditions warrant more frequent cleaning. The groundwater (that may be sourced from the existing boreholes) will be stored on site in suitable containers or reservoir tanks (or similar) during the operational phase. It is estimated that the panel washing process will require approximately 4 million to 6 million litres of water per year during operations. The quality of the groundwater and its suitability for use will be ascertained as part of the Geohydrological Assessment to be conducted during this EIA Process.

At this stage, no water is planned to be abstracted from or discharged to any surface water systems. If the groundwater is not sufficient or suitable for use, water will then be sourced from the municipal supply if required (i.e. delivery via water tankers). This will be confirmed as the project design develops.

2.3.2.5 Stormwater Channels and Water Pipelines

Stormwater channels will be constructed on site to ensure that stormwater run-off from site is appropriately managed. Water from these channels will not contain any chemicals or hazardous substances, and will be released into the surrounding environment based on the natural drainage contours.

The proposed project may also entail the construction drainage structures (i.e. French drains) for the transfer of waste water generated by the proposed facility. These structures may exceed 1000 m in length, may have an internal diameter of 0.36 m or more, and possibly a peak throughput of 120 l/s or more. Additional details will be provided during the EIA Phase.

As discussed above (in Section 2.3.2.4), water pipelines may need to be constructed to transfer water to the proposed facility. The proposed water pipelines may exceed 1000 m in length and 0.36 m in internal diameter. The need for these water pipelines and the length thereof will be determined based on the availability of groundwater (to be determined during the Geohydrological Assessment).

2.4 Overview of Project Development Cycle

2.4.1 Construction Phase

The construction phase will take place subsequent to the issuing of an Environmental Authorisation (EA) from the DEA and a successful BID in terms of the REIPPPP (i.e. the issuing of a PPA from the DOE). The construction phase for the proposed Kenhardt PV 1 project is expected to extend 14 months (however the construction period is subject to the final requirements of Eskom and the REIPPPP Request for Proposal provisions at that point in time).

The construction phase will involve the transportation of personnel, construction material and equipment to the site, and personnel away from the site. In terms of site establishment, laydown areas will be required at the outset of the construction phase, as well as dedicated access routes from the laydown areas to the working areas. Haul roads for construction traffic (for the delivery of concrete, road materials and other construction materials) will be required, as described in Section 2.3.2.2 above.

The laydown area will either be located adjacent to or at the project site. It is expected that the laydown area will be temporary in nature (for the duration of the construction phase) and will include the establishment of the construction site camp (including site offices and other temporary facilities for the appointed Contractors). The laydown area is expected to cover a maximum area of 5 ha (depending on the contracting strategy at the time). If the laydown area is located outside of the footprint of the solar facility itself, the area will thereafter be rehabilitated (i.e. returned to its pre-construction condition) at the end of the construction phase.

All efforts will be made to ensure that all construction work will be undertaken in compliance with local, provincial and national legislation, local and international best practice, as well as the Environmental Management Programme (EMPr), which will be compiled during the EIA Phase and included in the EIA Report. During the construction phase, both skilled and unskilled temporary employment opportunities will be created. It is difficult to specify the actual number of employment opportunities that will be created at this stage; however between 90 and 150 skilled and 400 and 460 unskilled employment opportunities are expected be created during the construction phase.

2.4.2 Operational Phase

The proposed Kenhardt PV 1 project is expected to become operational by 2018. The following activities will occur during the operational phase:

- Generation of 75 MW of electricity to add to the national grid; and
- Maintenance of the solar facility, including washing of panels (as explained in Section 2.3.2.4).

The projected operations are expected to provide several services and added economic spin offs (as highlighted in Chapter 1 of this Scoping Report). The solar facility is expected to generate

electricity for a minimum period of 20 years. The operational phase of the project is expected to create skilled employment opportunities. However, other opportunities may arise for unskilled labour to be integrated to the ancillary activities. Approximately 20 skilled and 40 unskilled employment opportunities will be created over the 20 year lifespan of the proposed facility.

2.4.3 Decommissioning Phase

The main aim of decommissioning is to return the land to its original, pre-construction condition. Should the unlikely need for decommissioning arise (i.e. if the facility becomes outdated or the land needs to be used for other purposes), the decommissioning procedures will be undertaken in line with the EMPr and the site will be rehabilitated and returned to its pre-construction state.

SCOPING REPORT



CHAPTER 3:

Description of the Affected Environment

Scoping and Environmental Impact Assessment for the Proposed Development of a 75 MW Solar Photovoltaic Facility (KENHARDT PV 1) on the remaining extent of Onder Rugzeer Farm 168, north-east of Kenhardt, Northern Cape Province

contents

3	DESCRIPTION OF THE AFFECTED ENVIRONMENT	3-4
3.1	Background	3-4
3.2	Preliminary Sensitivity Screening	3-4
3.3	Biophysical Environment	3-7
3.3.1	<i>Climatic Conditions</i>	3-7
3.3.2	<i>Topography and Landscape</i>	3-10
3.3.3	<i>Regional Geology</i>	3-13
3.3.4	<i>Soil Types and Soil Potential</i>	3-15
3.3.5	<i>Agricultural Capability and Sensitivity</i>	3-15
3.3.6	<i>Regional Hydrogeology</i>	3-16
3.3.7	<i>Existing Groundwater Data</i>	3-20
3.3.8	<i>Aquatic and Terrestrial Environment</i>	3-23
3.3.8.1	Aquatic Environment (Surface Water, Drainage, and Wetland Ecosystems)	3-23
3.3.9	<i>Terrestrial Environment</i>	3-24
3.3.9.1	General Vegetation Description	3-24
3.3.9.2	Fauna	3-25
3.3.9.3	Avifauna	3-26
3.3.10	<i>Protected Areas</i>	3-26
3.3.11	<i>Heritage Profile</i>	3-26
3.3.11.1	Palaeontology	3-26
3.3.11.2	Archaeology	3-27
3.3.11.3	Cultural and Natural Landscape (i.e. Visual Baseline)	3-28
3.3.12	<i>Socio-Economic Environment</i>	3-29
3.3.12.1	Demographic Profile	3-29
3.3.12.2	Economic Profile	3-32

tables

Table 3.1:	Average Monthly Rainfall (mm) for the Kenhardt area (Water Research Commission, undated)	3-7
Table 3.2:	The classification of moisture availability climate classes for summer rainfall areas across South Africa (Agricultural Research Council, Undated)	3-9
Table 3.3:	Geological Formations within the Study Area	3-13
Table 3.4:	Land Type Soil Data for the Site	3-15
Table 3.5:	Hydrocensus Boreholes (11 - 13 November 2014)	3-22
Table 3.6:	List of Species likely to occur in the Study Area	3-25
Table 3.7:	Population of the Local Municipalities within the ZF Mgcawu DM (Statistics SA, 2011)	3-30

figures

Figure 3.1:	Locality Map for the proposed Kenhardt PV 1 Project within a Regional Setting (GEOSS, 2015)	3-5
Figure 3.2:	Sensitivity Map for the proposed Kenhardt PV 1 project and the Alternative Site	3-6
Figure 3.3:	Mean Annual Rainfall Levels of South Africa (Source: Northern Cape PSDF, 2012)	3-7
Figure 3.4:	a) Rainfall and b) Average Midday Temperature for Kenhardt (www.saexplorer.co.za in GEOSS, 2015)	3-8
Figure 3.5:	Long Term Average Rainfall and Evaporation (Schulze et al., 2008 in GEOSS, 2015)	3-8
Figure 3.6:	Climate chart for Kenhardt showing the monthly maximum and minimum temperatures (lines) and the average rainfall (bars) (Source: Climatedata)	3-9
Figure 3.7:	Topographic cross-section (purple vertical line) from north to south of the proposed site (Holland, 2015)	3-11
Figure 3.8:	Topographic cross-section from west to east (green horizontal line) of the proposed site (Holland, 2015).	3-12
Figure 3.9:	Geological Setting of the study area and National Groundwater Archive Boreholes (Council for Geoscience map: 1:250 000 scale 2920 - Kenhardt) (GEOSS, 2015)	3-14
Figure 3.10:	Aquifer Type and Yield (Department of Water Affairs Groundwater Map: 1:500 000 scale 2920 - Prieska)	3-17
Figure 3.11:	Regional Groundwater Quality (Department of Water Affairs Groundwater Map: 1:500 000 scale 2920 - Prieska)	3-18
Figure 3.12:	National Groundwater Vulnerability (Calculated according to the DRASTIC Methodology) and boreholes (Department of Water Affairs and Forestry, 2005)	3-19
Figure 3.13:	Study Area and Hydrocensus Boreholes (GEOSS, 2015 (Imagery: ESRI))	3-21
Figure 3.14:	Surface Water Drainage and Wetlands (DWA and SANBI, 2015)	3-24
Figure 3.15:	Regional Vegetation Map showing the proposed project site (Source: SANBI/Mucina and Rutherford, 2007)	3-25
Figure 3.16:	Extract from 1: 250 000 scale geological map sheet 2920 Kenhardt (Council for Geoscience, Pretoria) showing the geology of the Scatec Solar PV Facilities study area on	

Farm Onder Rugzeer 168 situated to the NE of Kenhardt, Northern Cape. The PV 1 and PV 1b study sites are approximately indicated by the two orange polygons in the north and south respectively (Almond, 2015) 3-27

Figure 3.17: Siyanda DM (now known as ZF Mgcawu DM) boundary and boundaries of local municipalities (Siyanda DM IDP, 2013) 3-30

Figure 3.18: Percentage Distribution of Population per Population Group for the !Kheis Local Municipality in 2011 (Statistics South Africa, 2015). 3-31

Figure 3.19: Age Distribution of the ZF Mgcawu DM (Statistics South Africa, 2011). 3-31

Figure 3.20: Income Distribution of the !Kheis Local Municipality in 2011 (Statistics South Africa, 2015). 3-32

Figure 3.21: Education Levels of the !Kheis Local Municipality in 2011 (Statistics South Africa, 2015). 3-33

3 DESCRIPTION OF THE AFFECTED ENVIRONMENT

This chapter of the Scoping Report provides an overview of the affected environment for the proposed Kenhardt PV 1 project and the surrounding region. The receiving environment is understood to include biophysical, socio-economic and heritage aspects which could be affected by the proposed development or which in turn might impact on the proposed development.

This information is provided to identify the potential issues and impacts of the proposed project on the environment. The information presented here has been sourced from:

- Scoping input from the specialists that form part of the project team;
- Review of information available on the South African National Biodiversity Institute (SANBI) Biodiversity Geographical Information System (BGIS) and Agricultural Geo-Referenced Information System (AGIS); and
- !Kheis Local Municipality and ZF Mgcawu District Municipality IDPs and the Northern Cape PSDF.

It is important to note that this chapter intends to provide an overview and does not represent a detailed environmental study. Detailed studies focused on significant environmental aspects of this project will be provided during the EIA Phase.

3.1 Background

The proposed project is situated on the remaining extent of Onder Rugzeer Farm 168. The total farm property covers approximately 5552 ha in area and the preferred site will extend approximately 250 ha for Kenhardt PV 1. If all three solar PV projects proceed, only 13.5 % of the total farm area will be developed on. As previously noted, the site is located approximately 30 km north-east of Kenhardt, in the ZF Mgcawu District Municipality and the !Kheis Local Municipality in the Northern Cape Province. The co-ordinates of the corner points of the preferred project area are provided in Chapter 2 of this Scoping Report. Figure 3.1 provides a locality map of the proposed project area within a regional setting.

3.2 Preliminary Sensitivity Screening

Figure 3.2 represents the regional setting of the proposed Kenhardt PV 1 project in terms of the surrounding sensitive ecosystem features and sensitive geographical areas (as indicated in Listing Notice 3 of the 2014 EIA Regulations) in proximity to the site. Figure 3.2 includes the Geographic Information System (GIS) information required by the DEA solar energy EIAs.

Based on the preliminary sensitivity screening undertaken for the site, the proposed project area does not fall within any threatened ecosystems, National Protected Areas, National Protected Area Expansion Strategy (NPAES) Focus Areas or areas of conservation planning. The closest protected area is approximately 113 km away from the proposed project site. An Ecological Support Area (i.e. a buffer around the Hartbees River) is located approximately 14 km west of proposed project as part of the Namakwa District Biodiversity Sector Plan. There is no conservation plan for the !Kheis Local Municipality and the ZF Mgcawu District Municipality, hence Critical Biodiversity Areas are not present or defined. In terms of the National Biodiversity Assessment (NBA) (2011), rivers are classified into critically endangered, endangered, vulnerable and least threatened. Two rivers flow through the remaining extent of Onder Rugzeer Farm 168, as shown in Figure 3.2, one of which is named "Rugseers". However, these rivers are classed as not/least threatened.

Scoping and Environmental Impact Assessment for the proposed Development of a 75 MW Solar Photovoltaic Facility (KENHARDT PV 1) on the remaining extent of Onder Rugzeer Farm 168, north-east of Kenhardt, Northern Cape Province

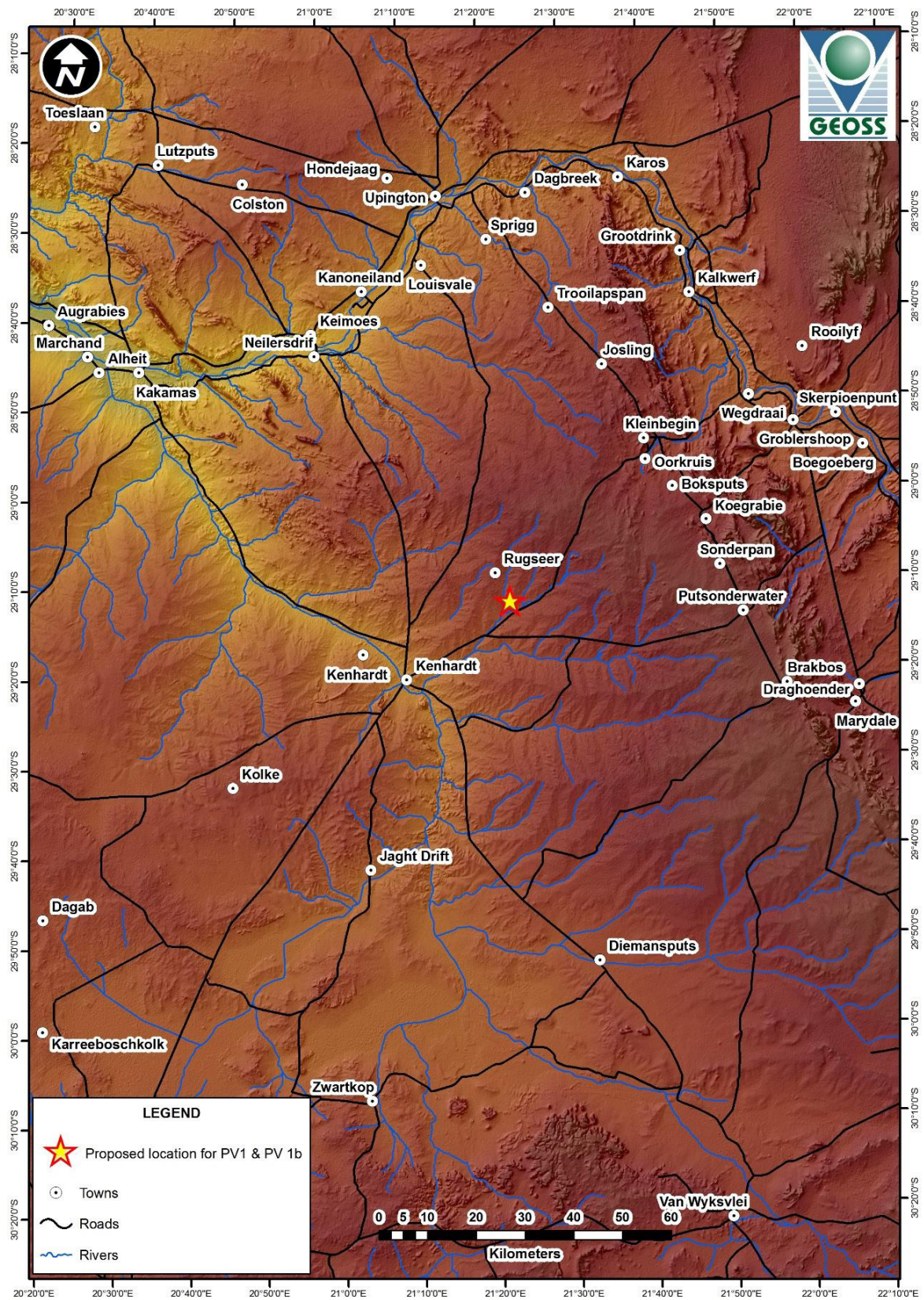


Figure 3.1: Locality Map for the proposed Kenhardt PV 1 Project within a Regional Setting (GEOSS, 2015)

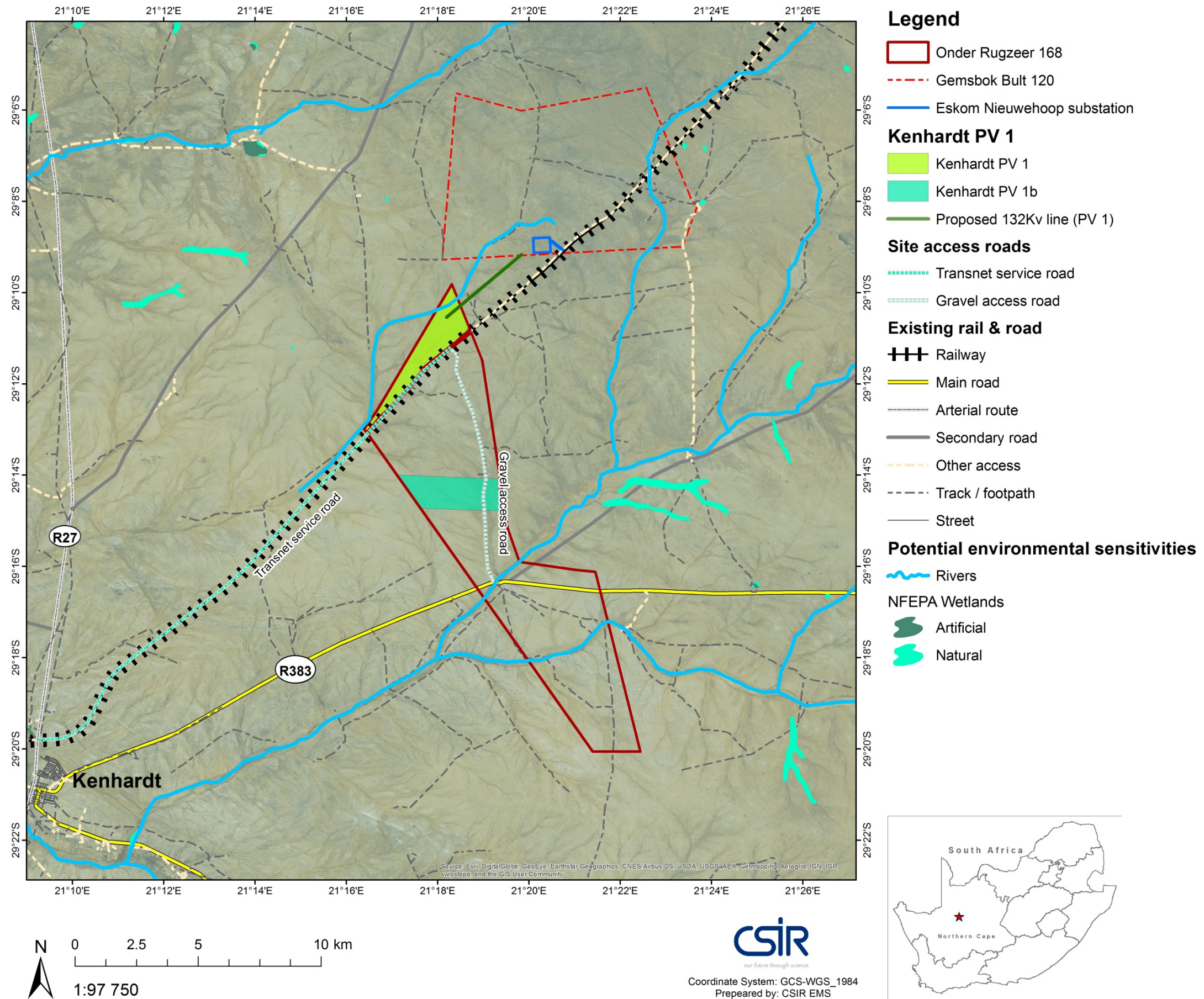


Figure 3.2: Sensitivity Map for the proposed Kenhardt PV 1 project and the Alternative Site

3.3 Biophysical Environment

3.3.1 Climatic Conditions

The mean annual rainfall of South Africa is shown in Figure 3.3 below. The climate of the Northern Cape is semi-arid with a late summer-autumn rainfall regime. Average rainfall of the area varies from 50 mm to 400 mm per year. Evaporation levels within this province exceed the annual rainfall. Climate conditions are extreme (i.e. very cold in winter and extremely hot in summer).

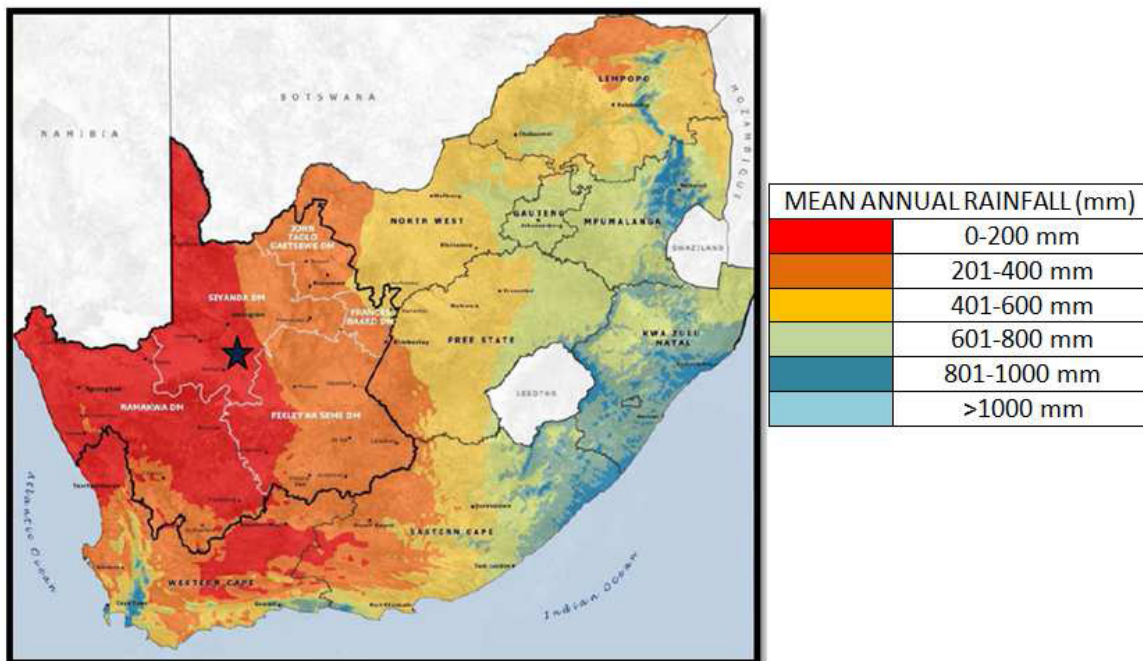


Figure 3.3: Mean Annual Rainfall Levels of South Africa (Source: Northern Cape PSDF, 2012)

The Kenhardt area (in which the proposed projects fall) has a very low rainfall level, 183 mm per annum, with a standard deviation of 71 mm, according to the South African Rain Atlas (Water Research Commission, undated)¹. The average monthly distribution of rainfall is shown in Table 3.1.

Table 3.1: Average Monthly Rainfall (mm) for the Kenhardt area (Water Research Commission, undated)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
25	33	38	24	11	5	3	4	5	8	11	16	183

Most rainfall in Kenhardt occurs mainly during autumn. Figure 3.4 (a) shows the average rainfall values for Kenhardt per month. It typically receives the lowest rainfall (0mm) in June and the highest (23mm) in March (GEOSS, 2015).

¹ Data available online at: <http://134.76.173.220/rainfall/index.html>

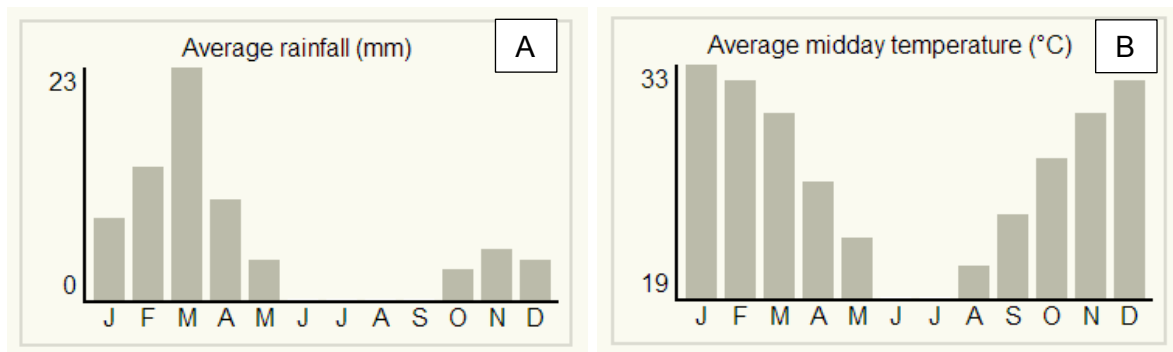


Figure 3.4: a) Rainfall and b) Average Midday Temperature for Kenhardt (www.saexplorer.co.za in GEOSS, 2015)

The monthly distribution of rainfall and evaporation for the remaining extent of Onder Rugzeer Farm 168 is shown in Figure 3.5. Since the area receives most of its rainfall during autumn it has a semi-arid to arid climate (as noted above). The relevance of this information is that the rainfall occurs whilst temperatures are quite high still and associated evaporation rates will be high. This implies that groundwater recharge will be very low. Figure 3.5 shows the long term monthly rainfall and evaporation distribution respectively (GEOSS, 2015).

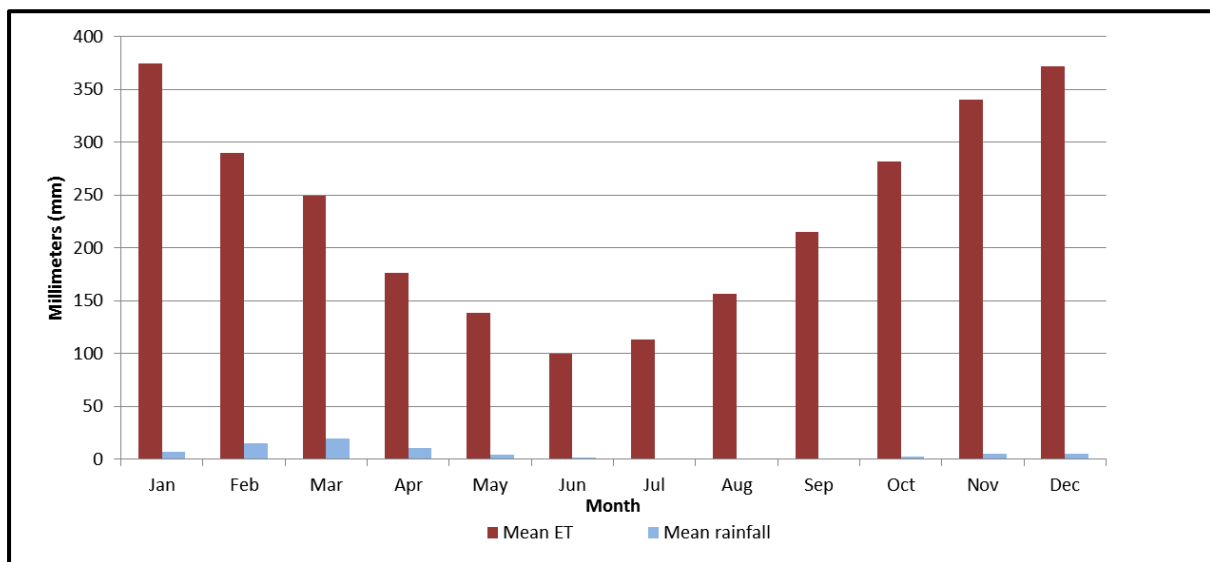


Figure 3.5: Long Term Average Rainfall and Evaporation (Schulze et al., 2008 in GEOSS, 2015)

Figure 3.6 shows the average monthly climatic chart for Kenhardt². As shown in Figure 3.6, the highest temperatures are reached in the summer months (December to January) and the lowest in the winter months (June to August). The average temperature of the area is 19.6 °C, with an annual average high temperature of 28 °C and an annual average low temperature of 11 °C. The monthly distribution of average daily maximum temperatures (Figure 3.4 (b)) shows that the average midday temperatures for Upington range from 19 °C in June to 33 °C in January (GEOSS, 2015).

The average daily solar radiation levels in South Africa range between 4.5 and 6.5 kilowatt-hour per square meter (kWh/m²). In South Africa the measured solar radiation is the highest in the Northern Cape, North West Province and the Free State. As discussed in Chapter 2 and Chapter 5 of this Scoping Report and shown in Figure 5.4, the site was selected because of the high solar radiation levels of the area (2300 kWh/m² per annum or 6.3 kWh/m² per day).

² Data available online at: <http://www.climatedata.eu>

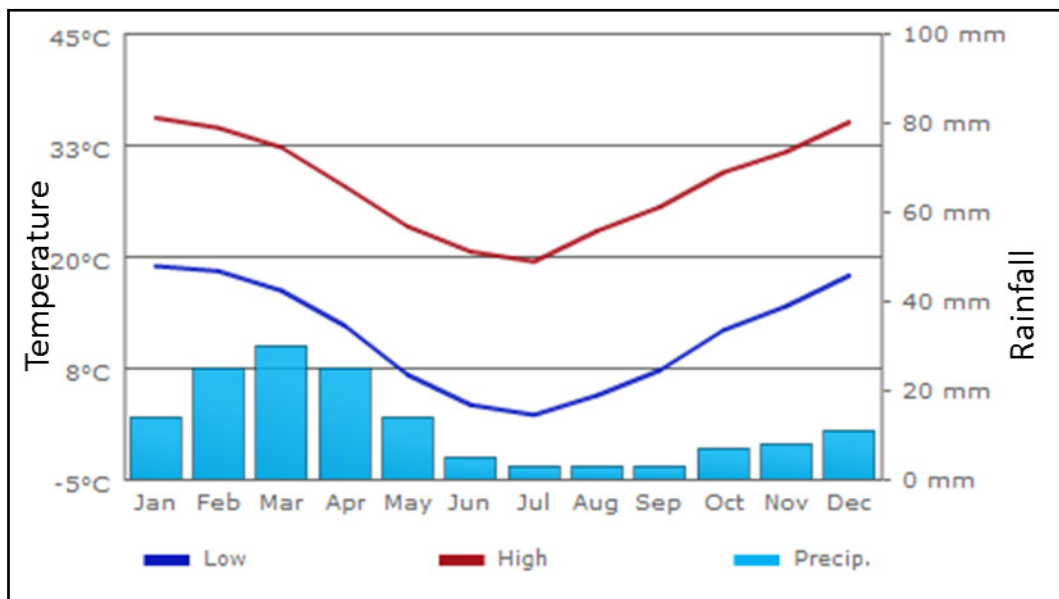


Figure 3.6: Climate chart for Kenhardt showing the monthly maximum and minimum temperatures (lines) and the average rainfall (bars) (Source: Climatedata)

One of the most important climate parameters for agriculture in a South African context is moisture availability, which is the ratio of rainfall to evapotranspiration. Moisture availability is classified into 6 categories across the country (as shown in Table 3.2). The proposed development site falls within class 6 which is described as a very severe limitation to agriculture (Lanz, 2015).

Table 3.2: The classification of moisture availability climate classes for summer rainfall areas across South Africa (Agricultural Research Council, Undated)

Climate class	Moisture availability (Rainfall/0.25 PET)	Description of agricultural limitation
C1	>34	None to slight
C2	27-34	Slight
C3	19-26	Moderate
C4	12-18	Moderate to severe
C5	6-12	Severe
C6	<6	Very severe

3.3.2 Topography and Landscape

The topography of the region is flat with gentle, open undulations (West-East elevations ranging between 936 m and 1000 m, and North-South elevations ranging between 895 m and 1018 m, as shown in Figure 3.7 and Figure 3.8 below) (Holland, 2015). The underlying geology of the sites belongs to the Vyfbeker Metamorphic Suite and represents supracrustal rocks (sediments which have undergone several episodes of metamorphism and deformation) of the Kakamas Terrane (Johnson, Anhaeusser, and Thomas 2006). Erosion resistant rocks of this suite form distinctive low rocky hills that are often visible in the distance, although none occur in the study area. Vegetation consists of low shrubs and grassland with occasional quiver trees (kokerboom), and produces a mottled background to most views which is effective at making some development types such as power lines and pylons blend in with the background (Holland, 2015).

Furthermore, the proposed development site lies across a low ridge that effectively bisects the area into two watersheds (SDP, 2015). Some shallow depressions are also evident arising from the variable sandy ridges that overlie the sandstone - dolerite geology of the area (SDP, 2015). Slopes across the site are almost entirely less than 2% with slightly steeper relief in some isolated spots (Lanz, 2015).

The Kenhardt landscape is arid with brown sand occurring widely being occasionally interspersed with black boulders. Because of the lack of trees in the area, a large number of weaver birds make use of the telegraph poles along the road to build their community nests (GEOSS, 2015).

A description of the geology and vegetation of the region is respectively provided in Section 3.3.3 and Section 3.3.8 of this chapter.

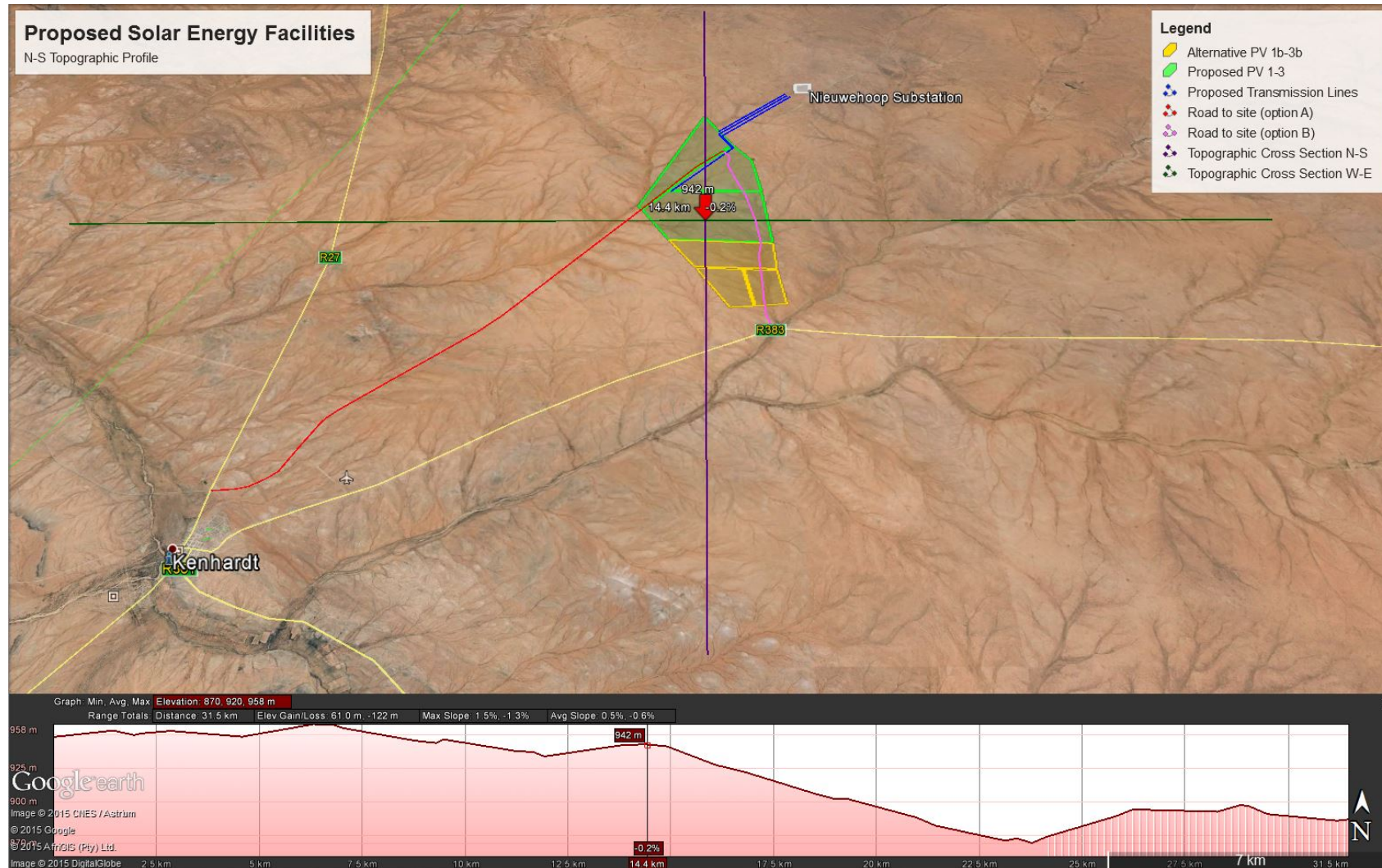


Figure 3.7: Topographic cross-section (purple vertical line) from north to south of the proposed site (Holland, 2015)

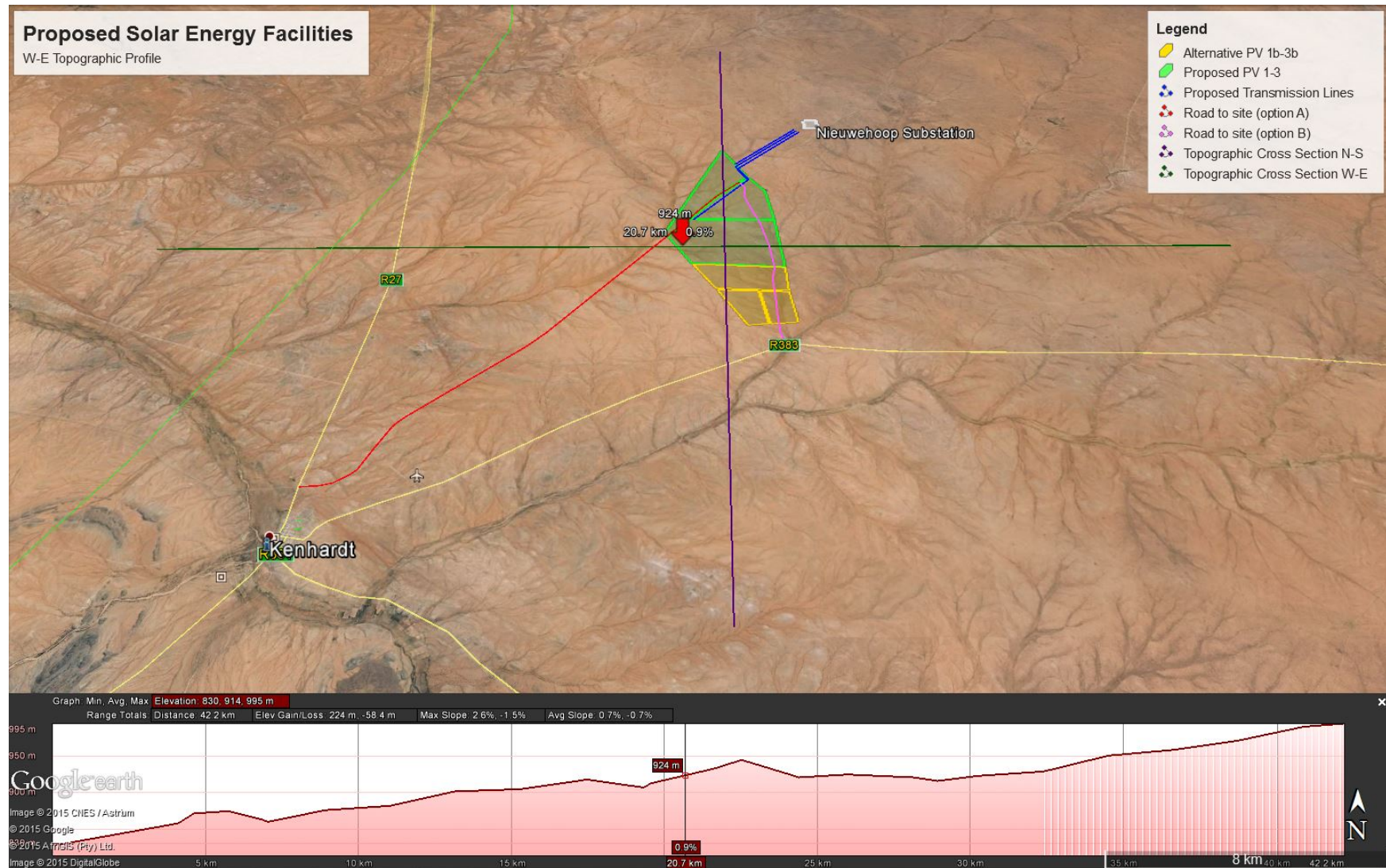


Figure 3.8: Topographic cross-section from west to east (green horizontal line) of the proposed site (Holland, 2015).

3.3.3 Regional Geology

The Geological Survey of South Africa (now the Council for Geoscience) has mapped the area at 1:250 000 scale (2920 - Kenhardt). The geological setting is shown in Figure 3.9. The main geology of the area is listed in Table 3.3. The formations occurring within the study area are indicated in bold (and shaded) in Table 3.3 (GEOSS, 2015).

Table 3.3: Geological Formations within the Study Area

Symbol	Name	Group	Description
Qg	Gordina Formation	Kalahari	Wind-blown dunes
Mks	Klip koppies granite	Keimoes suite	Grey, fine to medium grained porphyritic granite
Mb	Brussel granite		Grey, fine to medium grained porphyritic granite
Me	Elsie se gorja granite		Grey, medium grained granite, well-foliated.
Mva	Valsvei	Biesje poort	Yellow weathered, medium grained quartzitic gneiss with lenses of calc-silicate pelitic gneiss
Msa	Sandputs		Grey to brown, fine grained weather calc-bearing quartzite
Mja	Jacomyns pan	Jacomyns pan	Pelitic gneisses with quartzite, leuco-gneiss, amphibolite and calc-silicate rocks.
Mke	Kenhardt migmatiet	Metamorphic suite	Migmatitic biotite gneiss, amphibolite, leucogneiss and porphyroblastic biotite.

The oldest rocks in the area comprise of metamorphic gneisses (altered granite) which belong to the Jacomyns Pan Formation (Mja). The Jacomyns Pan Formation is also part of the Jacomyns Pan Group. These rocks mainly occur in the northern and central portion of the study area and are presumed to be bedrock. The alternative site for Kenhardt PV 1 (i.e. PV 1b) of the study area is underlain by a much younger formation Me (Elsie se gorja granite). This formation comprises of grey medium grained granite with distinct foliation. The study areas are both overlain by wind-blown sand (Qg) of the Gordonia Formation. The Gordonia Formation is part of the Kalahari Group (GEOSS, 2015). The stream channels are filled with alluvial material (Slabbert *et al*, 1999).

Two structural features are indicated as faults on the map sheet trend in a north-west to south-east direction. The structural features intersect the study area for Kenhardt PV 1 on the south-west border and intersect the study area for the alternative site (i.e. PV 1b) on its north-east border (GEOSS, 2015).

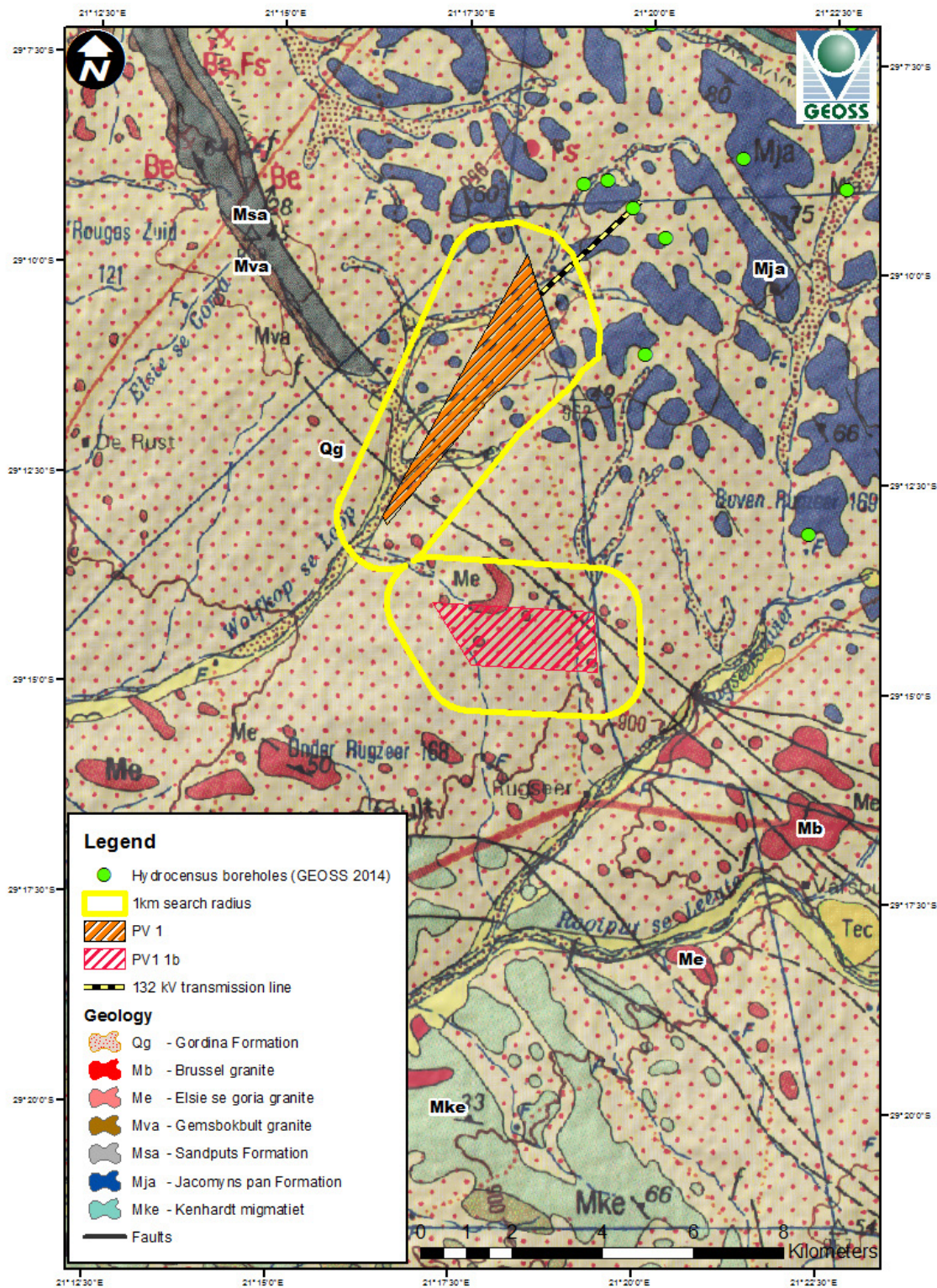


Figure 3.9: Geological Setting of the study area and National Groundwater Archive Boreholes (Council for Geoscience map: 1:250 000 scale 2920 - Kenhardt) (GEOSS, 2015)

3.3.4 Soil Types and Soil Potential

All the information on soils and agricultural potential in this chapter has been obtained from the online AGIS, produced by the Institute of Soil, Climate and Water (Agricultural Research Council, undated).

The land type classification is a nationwide survey that groups areas of similar soil, terrain and climatic conditions into different land types. The proposed development is located on two land types, Ag6 in the north and the very similar Ag2 in the south. These land types comprise predominantly shallow, red, sands to loamy sands on underlying rock, hard-pan carbonate, or hard-pan dorbank. The soils fall into the arid Silicic, Calcic, and Lithic soil groups according to the classification of Fey (2010). A summary detailing soil data for the land type is provided in Table 3.4 below. The land has a low to moderate water erosion hazard, mainly due to the low slope, but it is susceptible to wind erosion because of the sandy texture of the soil (Lanz, 2015).

Table 3.4: Land Type Soil Data for the Site

Land type	Land capability class	Soil series (forms)	Depth (cm)	Clay % A horizon	Clay % B horizon	Depth limiting layer	% of land type
Ag6	7	Hutton	10-35	6-12	7-15	ca, so, db	43
		Mispah	5-15	5-12		R	14
		Hutton	45->120	6-12	7-15	ca, so, R	10
		Hutton	10-35	10-20	15-25	ca, so, db	9
		Rock outcrop	0			R	8
Ag2	7	Hutton	10-30	4-13	6-15	so, db, R	30
		Mispah	5-15	5-12		R	18
		Glenrosa	10-30	3-13		so	10
		Hutton	10-30	10-20	15-25	so, db, R	9
		Hutton	45->120	3-13	3-15	so, R, db	8
		Mispah	5-15	5-12		db	7
		Rock outcrop	0			R	7

Land capability classes: 7 = non-arable, low potential grazing land.

Depth limiting layers: R = hard rock; so = partially weathered bedrock; ca = hardpan carbonate; db = dorbank hardpan.

3.3.5 Agricultural Capability and Sensitivity

Land capability is the combination of soil suitability and climate factors. The area has a land capability classification, on the 8 category scale, of Class 7 - non-arable, low potential grazing land. The limitations to agriculture are aridity and lack of access to water plus the shallow soil depth and rockiness. Because of these constraints, agricultural land use is restricted to low intensity grazing only. The natural grazing capacity is low, at mostly 31-40 hectares per animal unit (Lanz, 2015).

In terms of agricultural sensitivity, the farm is located within a sheep farming agricultural region and there is no cultivation on the farm. Agricultural potential is uniformly low across the farm and the choice of placement of the proposed facility on the farm therefore has minimal influence on the significance of agricultural impacts. No agriculturally sensitive areas occur within the site.

3.3.6 Regional Hydrogeology

According to the 1:500 000 scale groundwater map of Prieska (2920) the entire study area does host an “intergranular and fractured” aquifer (i.e. wind-blown sands and river alluvium as well as fractures within the bedrock constituting the aquifer) with an average borehole yield of 0.1 L/s to 0.5 L/s (DWAF, 2002), as shown in Figure 3.10 below (GEOSS, 2015).

With such low rainfall in the area, and thus associated low groundwater recharge conditions, it is anticipated that the groundwater quality will be poor. The regional 1:500 000 groundwater quality map, shown in Figure 3.11 below, indicates that the groundwater quality in the southern portions of the study area will be of relatively better groundwater quality than the northern portion. Using Electrical Conductivity (EC) as a groundwater quality indicator, the EC ranges from 70 - 300 mS/m, in these two areas. In terms of domestic supply this is classified as “marginal”. It cannot be used for irrigation (unless very salt tolerant plants are cultivated) or for the washing down of solar panels as it will most probably leave a salty deposit on the panels. In the northern part of the study area, the groundwater quality is poorer and the EC ranges from 300 - 1 000 mS/m (WRC, 2012). In terms of domestic supply this is “poor” water quality and cannot be used for irrigation or washing down of solar panels (GEOSS, 2015).

The national scale groundwater vulnerability map, which was developed according to the DRASTIC methodology (DWAF, 2005), classifies the area as having a “medium to high” vulnerability to surface based contaminants (Figure 3.12). The DRASTIC method takes into account the following factors:

D	=	depth to groundwater	(5)
R	=	recharge	(4)
A	=	aquifer media	(3)
S	=	soil type	(2)
T	=	topography	(1)
I	=	impact of the vadose zone	(5)
C	=	conductivity (hydraulic)	(3)

The number indicated in parenthesis at the end of each factor description is the weighting or relative importance at that factor (GEOSS, 2015).

However this assessment is based on national scale mapping. Based on the local conditions at the study area there is a very low risk of groundwater contamination in this area as the groundwater level is relatively deep (GEOSS, 2015).

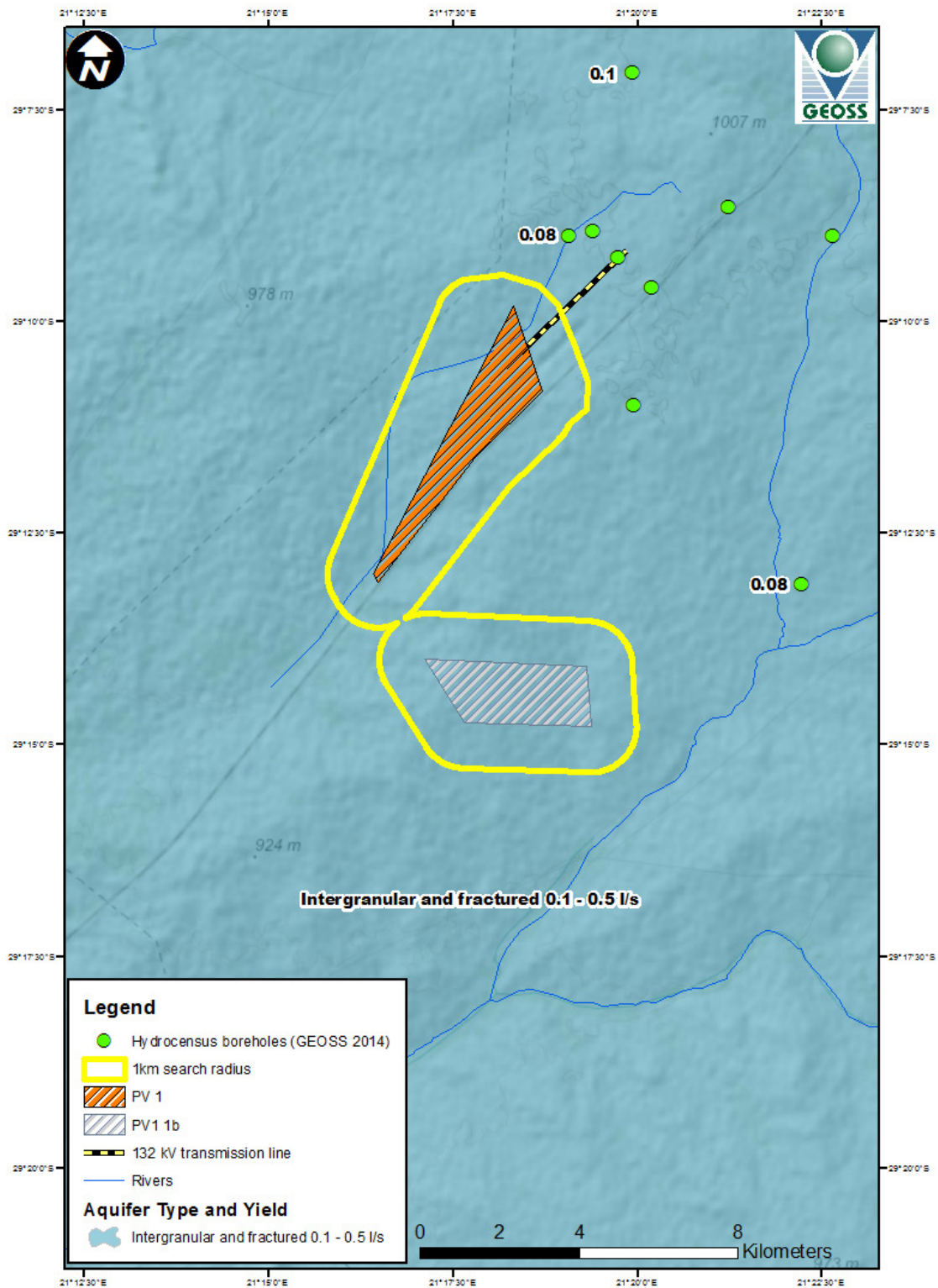


Figure 3.10: Aquifer Type and Yield (Department of Water Affairs Groundwater Map: 1:500 000 scale 2920 - Prieska)

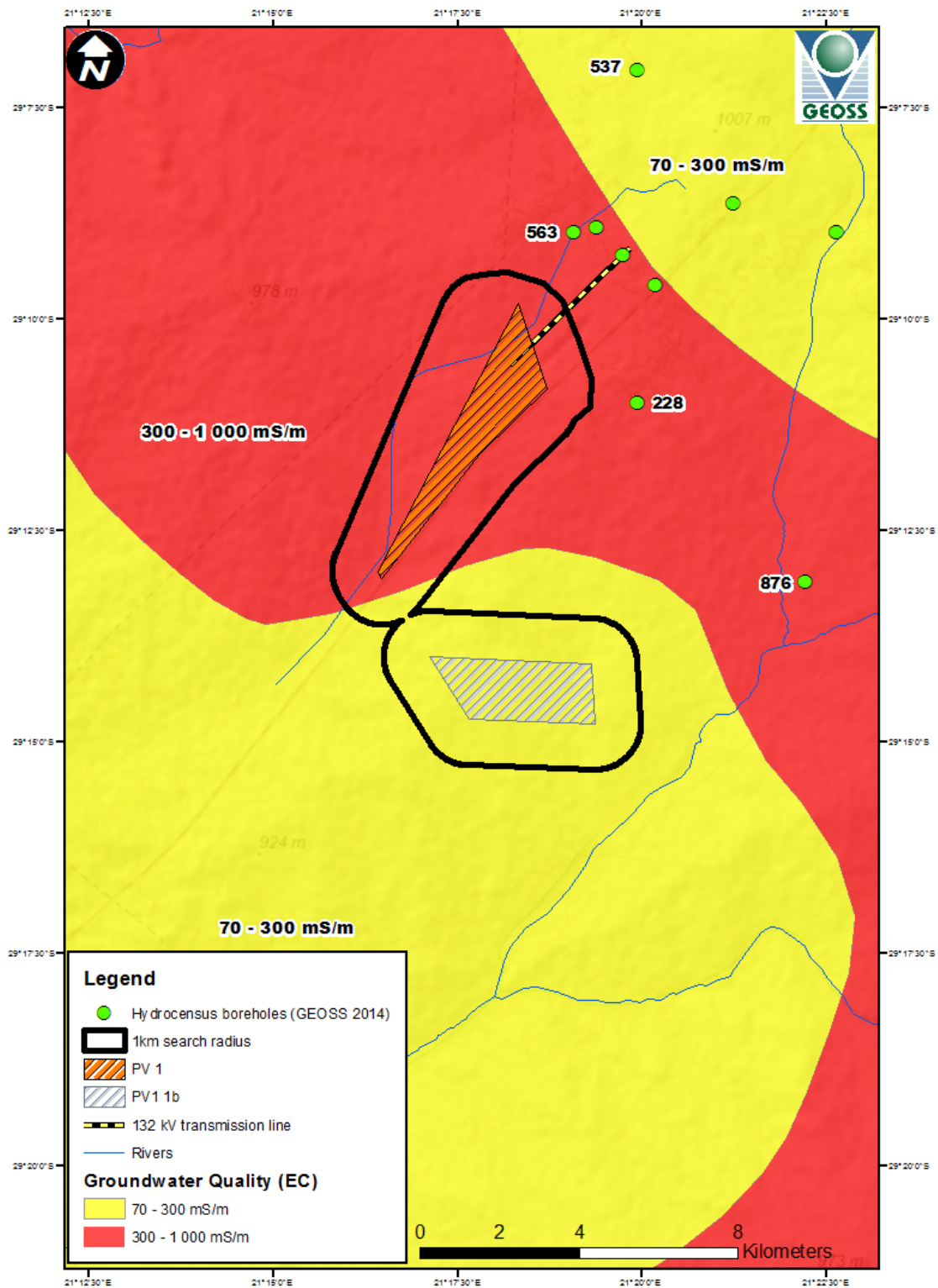


Figure 3.11: Regional Groundwater Quality (Department of Water Affairs Groundwater Map: 1:500 000 scale 2920 - Prieska)

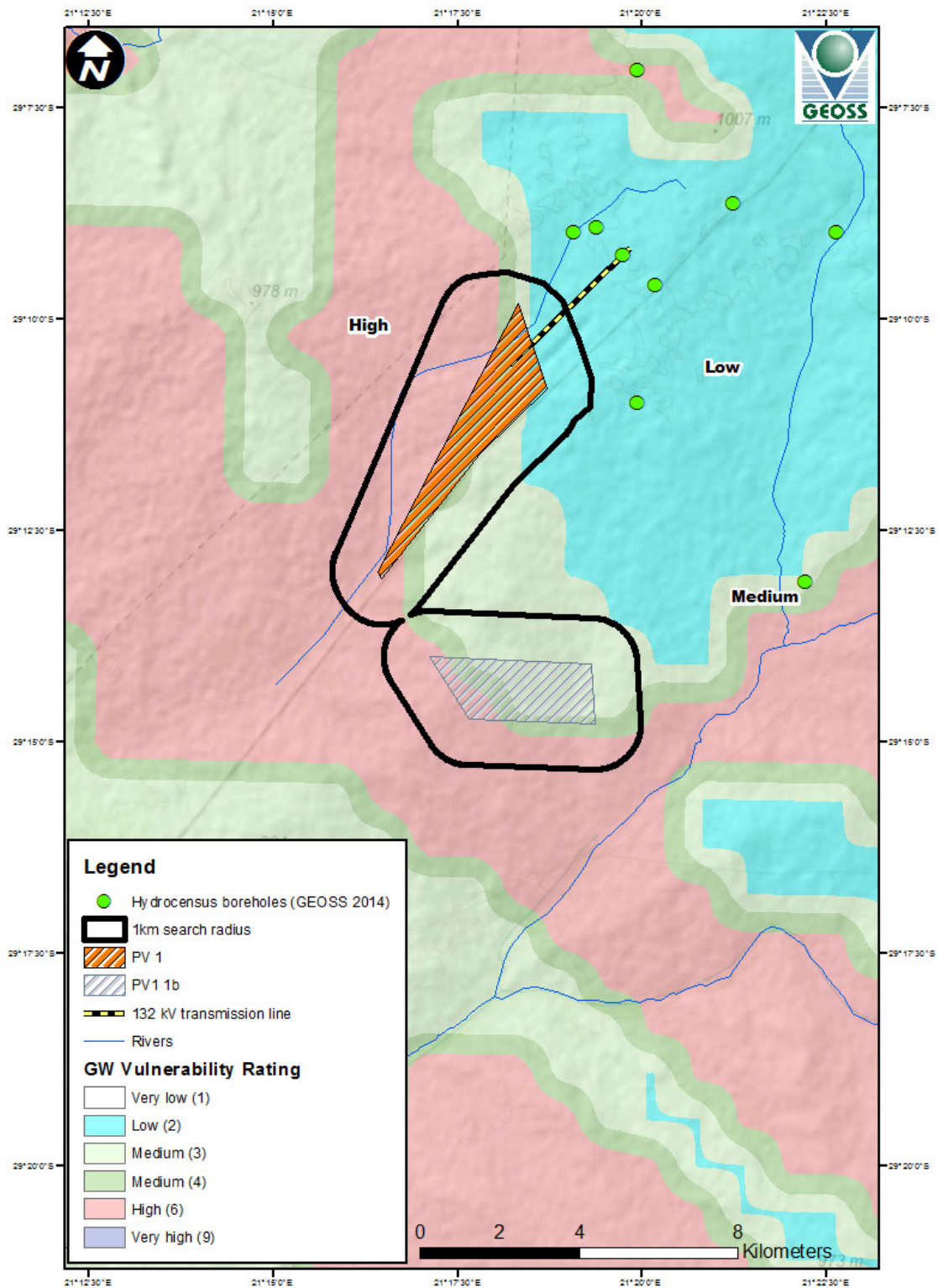


Figure 3.12: National Groundwater Vulnerability (Calculated according to the DRASTIC Methodology) and boreholes (Department of Water Affairs and Forestry, 2005)

3.3.7 Existing Groundwater Data

A search was completed of the National Groundwater Archive database which provides data on borehole positions, groundwater chemistry and borehole yield for the study area. A 1 km search radius was used for both Kenhardt PV 1 and the alternative site (PV 1b) around their boundaries. The National Groundwater Archive database indicated no boreholes within the 1 km search radius (GEOSS, 2015).

In November 2014, GEOSS conducted a hydrocensus on the adjacent farm Boven Rugzeer Remaining Extent of 169 and during the field hydrocensus the locations of the 10 boreholes were identified within the farm portion and three were found within the Transnet servitude (GEOSS, 2015).

The hydrocensus boreholes were found to be dry or to have very low yields (GEOSS, 2014). Relevant information regarding borehole yields, borehole and groundwater depths and groundwater quality was also obtained from the land owner. It has been reported that borehole depths are typically between 60 - 120 m deep and fractures occur within the highly metamorphic rocks between two zones of 15 - 30 m and 100 - 120 m below ground level (GEOSS, 2015).

A summary of hydrocensus boreholes and their field chemistry can be found in Table 3.5. The hydrocensus boreholes have been spatially represented in Figure 3.13 (GEOSS, 2015).

The hydrocensus revealed that the potential for groundwater use within the area is very limited and of poor quality and saline. The total dissolved solids within the study area range from 1 200 - 7 780 mg/L and salinity has a range of 840 - 4 700 mg/L. Groundwater is primarily used for livestock watering and domestic use to a limited extent.

Overall, the proposed site for the proposed solar PV project (Kenhardt PV 1 and alternative site PV 1b) will have a minimal effect on the geohydrology of the area. The study area is located in a highly metamorphic geological setting. Metamorphic rocks rarely produce sufficient groundwater and are considered an effective barrier to groundwater flow. The poor potential for groundwater development is related to the low occurrence of fractured networks within the formations.

From groundwater level data obtained and measured it is evident that the water level ranges from 19 to 20 metres below ground level (mbgl) regionally. The DRASTIC rating of medium to high vulnerability to surface based contamination has a high degree of uncertainty as the data sets are based on a national scale. The intergranular wind-blown sands of the Gordonina Formation are relatively thin in the study area and bedrock comprises highly metamorphic rock types that have been classified as having a low vulnerability to surface based contamination (GEOSS, 2015).

Additional information regarding potential issues and impacts are described in Chapter 6 of this Scoping Report.

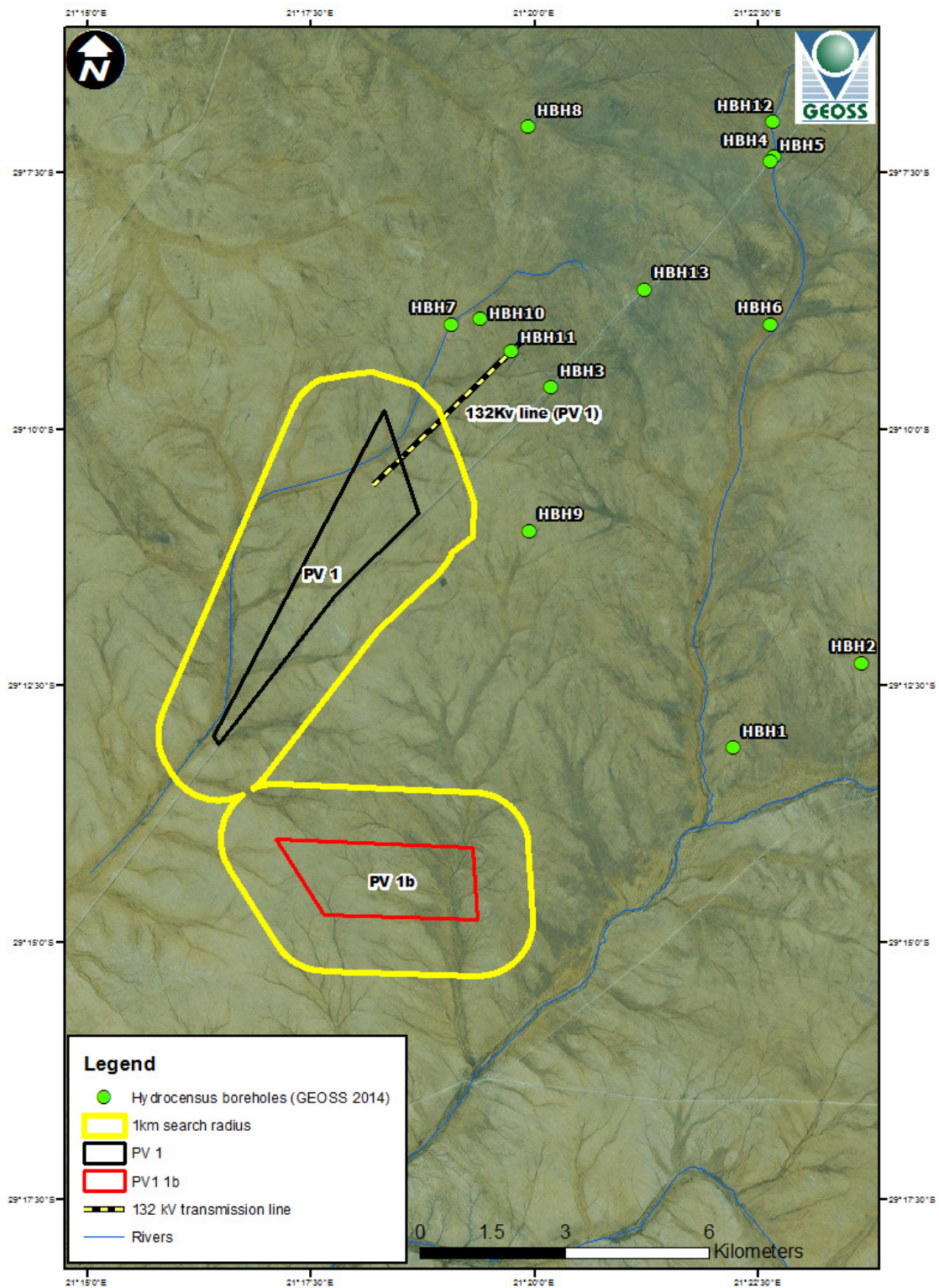


Figure 3.13: Study Area and Hydrocensus Boreholes (GEOSS, 2015 (Imagery: ESRI))

Table 3.5: Hydrocensus Boreholes (11 - 13 November 2014)

Location	Latitude (WGS84)	Longitude (WGS84)	WL (mbch)	CH (m)	WL (mbgl)	pH	Temp. (°C)	ORP (mV)	EC (mS/m)	TDS (mg/L)	Salinity (mg/L)	Comment
HBH1	-29.2185	21.3701	19.506	0.37	19.136	7.32	17.3	-18	876	7 780	4 700	Low yield ~0.04 L/s
HBH2	-29.2048	21.39401	-	-	-	7.80	25	-	338	1 951	-	No access point for WL
HBH3	-29.1600	21.33626	43	0.3	42.7	-	-	-	-	-	-	Dry, water from seep
HBH4	-29.1226	21.37785	-	-	-	-	-	-	-	-	-	1.2 L/s Transnet BH
HBH5	-29.1233	21.37715	-	-	-	-	-	-	-	-	-	0.6 L/s Transnet BH
HBH6	-29.1498	21.37715	-	-	-	-	-	-	-	-	-	Dry
HBH7	-29.1498	21.31763	-	-	-	7.28	17.4	-17	563	4 320	2 960	0.08 L/s sampled from reservoir
HBH8	-29.1177	21.3320	-	-	-	7.16	17.5	-10	537	4 110	2 840	0.1 L/s, sampled from reservoir
HBH9	-29.1833	21.33219	-	-	-	7.29	17.6	-10	228	1 680	1 150	Low yield - windpump
HBH10	-29.1489	21.32297	-	-	-	-	-	-	-	-	-	Dry
HBH11	-29.1542	21.3288	-	-	-	-	-	-	-	-	-	Dry
HBH12	29.11688	21.3775	-	-	-	7.7	17.4	-43	168	1 200	840	0.13 L/s windpump no WL access
HBH13	-29.1441	21.35368	-	-	-	-	-	-	-	-	-	Dry

HBH = hydrocensus borehole

WL = water level

CH = collar height

Temp = temperature

ORP = oxygen reduction potential

EC = electrical conductivity

TDS = total dissolved solids

mbch = metres below collar height

m = metres

mV = milliVolts

mS/m = milliSiemens per metre

mg/L = milligrams per metre

mbgl = metres below ground level

3.3.8 Aquatic and Terrestrial Environment

The SANBI BGIS has been used to define the regional vegetation, water resources, faunal and avifaunal and anticipated ecological sensitivity of the study area. A literature review of existing reports, scientific studies, databases, reference works, guidelines and legislation relevant to the study area was conducted to establish the baseline ecological and vegetative condition of the site and associated environment. It should be noted that exact details pertaining to the aquatic and terrestrial environment will be provided in the EIA Reports, subsequent to the completion of the field work to be undertaken as part of the EIA Phase.

3.3.8.1 Aquatic Environment (Surface Water, Drainage, and Wetland Ecosystems)

The Northern Cape is divided into the following four Water Management Areas:

- Lower Orange;
- Upper Orange;
- Olifants/Doorn; and
- Lower Vaal.

The proposed development area falls within the Lower Orange Water Management Area. The Orange River system drains 47 % of South Africa's surface area and is the river supporting the most water uses, including agricultural, mining, industry and municipal.

The National Freshwater Ecosystems Protected Areas (NFEPAs) project earmarked several important catchments (sub-quaternaries) based either on the presence of important biota (e.g. rare or endemic fish species) or the degree or lack thereof with regard to riverine degradation, i.e. the greater the catchment degradation the lower the priority to conserve the catchment. The important catchments areas are then classified as Freshwater Ecosystem Protection Areas (FEPAs). No FEPAs are located within the study area or immediately downstream of the study area (SDP, 2015).

Figure 3.14 shows the surface water and drainage associated with the site and the FEPAs in the greater region. A number of surface water drainage features are associated with the development area and these may be considered sensitive environments, which will be determined during the EIA Phase of the proposed project (SDP, 2015).

Desktop research undertaken by Colloty (2014) for an adjacent proposed solar PV project indicates that the area falls within two quaternary catchments namely D53C and D53B of the Hartbees River. Several main stem rivers are found within these catchments. These tributaries include:

- Rugseers;
- Rooiput se Leegte;
- Nrougas se Loop; and
- Several unknown tributaries.

As shown in Figure 3.2 above, the two river systems flow through the remaining extent of the Onder Rugzeer Farm 168 (the project site), which include the Rugseers and an unnamed river which lead to the Hartbees River. Drainage consists mainly of dry or ephemeral water courses and the major water courses are tributaries of the Orange River (Holland, 2015).

The proposed development from an aquatic vegetation point of view is dominated by species associated with the Nama Karoo (Bushmanland Arid Grassland) vegetation ecosystem. These systems are thus usually devoid of any trees with strict riparian or wetland affiliations due to the largely ephemeral nature of the rivers/water courses within the region (Colloty, 2014).

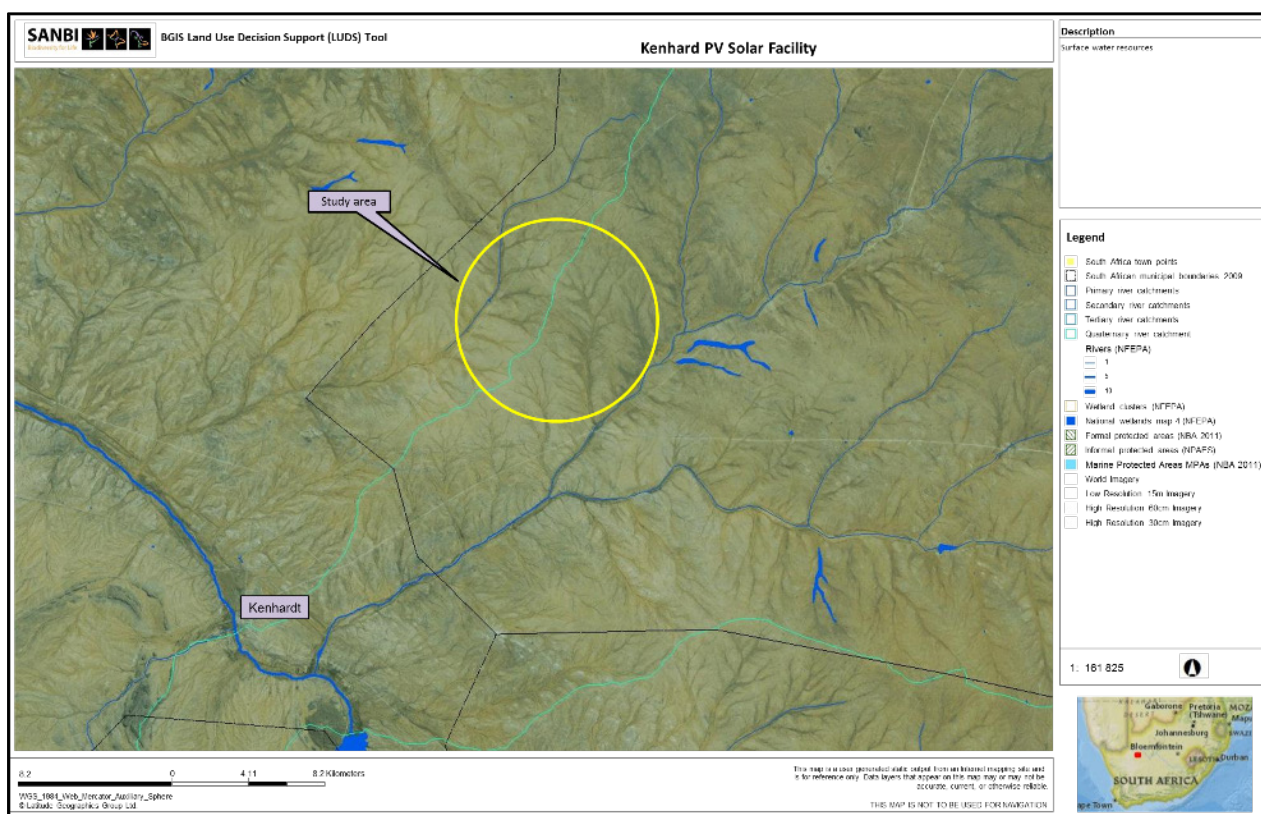


Figure 3.14: Surface Water Drainage and Wetlands (DWA and SANBI, 2015)

3.3.9 Terrestrial Environment

3.3.9.1 General Vegetation Description

The study area is located in the Nama Karoo biome of South Africa. The site falls within the Bushmanland Arid Grassland (Nkb3) (Figure 3.15) vegetation type (Mucina and Rutherford 2006). This vegetation unit is the second most extensive vegetation type in South Africa extending from around Aggeneys in the east to Prieska in the west. It is associated with freely draining alkaline soils common to this area. This vegetation form comprises, under a natural state, primarily of arid grassland dominated by *Aristida spp* and *Stipagrostis spp* (SDP, 2015).

The climate of the area is considered “arid”, receiving between 70 and 200 mm annual rainfall. More than 99% of the original extent of the vegetation type is considered to be remaining intact and as a consequence, its’ conservation status is classified as “least threatened” (i.e. this vegetation type is not listed as Threatened Ecosystems under the NEMBA). Mucina and Rutherford (2006) list 6 endemic species for this vegetation type, namely the succulent shrubs *Dinteranthus pole-evansii*, *Larryleachia dinteri*, *L marlothi*, *Ruschia kenhardtensis* and herbs *Lotononis oligocephala* and *Nemesia maxi*. A biogeographically important taxon is *Tridentea dwequensis* (SDP, 2015).

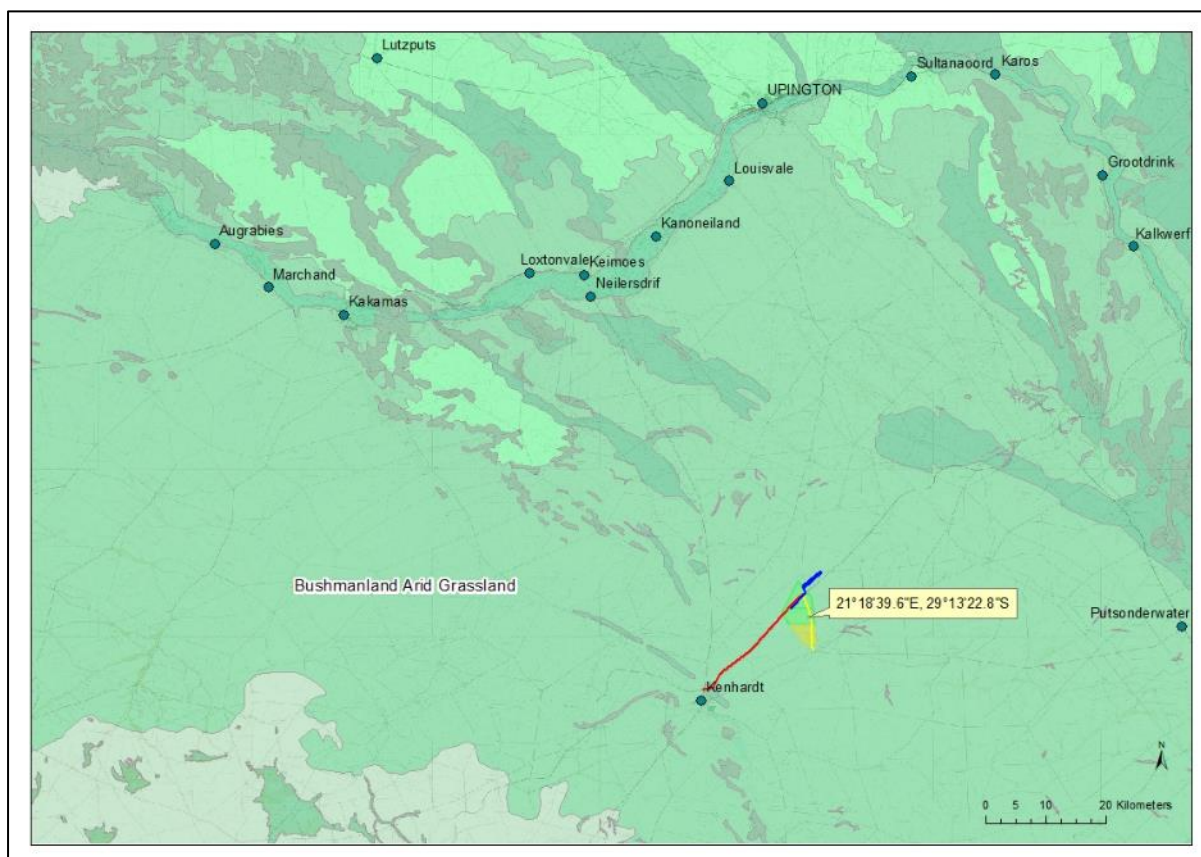


Figure 3.15: Regional Vegetation Map showing the proposed project site (Source: SANBI/Mucina and Rutherford, 2007)

3.3.9.2 Fauna

The fauna that can be expected in the study area (as determined from known distribution records and other studies) are presented in Table 3.6.

Table 3.6: List of Species likely to occur in the Study Area

Common Name	Species Name	Red Data List Category
Mammals		
Black-backed Jackal	<i>Canis mesomelas</i>	Least concern
Bat eared fox	<i>Otocyon megalotis</i>	Least concern
Namaqua Rock Mouse	<i>Aethomys namaquensis</i>	Least concern
Large spotted gennet	<i>Genetta tigrina</i>	Least concern
Amphibians		
Tremelo Sand Frog	<i>Tomopterna cryptotis</i>	Least Concern
Reptiles		
Verreaux's Tent Tortoise	<i>Psammobates tentorius</i>	Not listed
Southern Rock Agama	<i>Agama atra</i>	Least concern
Variegated Skink	<i>Trachylepis variegata</i>	Least concern

Very few signs of animal activities were noted during the surveys conducted by Envirolution Consulting in November 2013 for the updating of the Eskom Nieuwehoop Substation Construction and Operational Environmental Management Programme (COEMPr)³. Evidence was limited to small mammals such as Cape Ground Squirrel (*Xerus inauris*) and runways of the Striped mouse

³ Report sourced from: mp2mas17.eskom.co.za/tenderbulletin/File_Show.asp?ID=89791

(*Rabdomys pumilio*). As shown in Table 3.6 above, additional species are expected in the greater study area and will be surveyed during the EIA Phase.

3.3.9.3 Avifauna

According to the South African Bird Atlas Project (SABAP2), an average of 182 bird species have been recorded in the greater study area. The study area does not fall within or in close proximity to any Important Birds Areas (IBAs), with the closest being the Augrabies Falls National Park, located over 100 km to the north west of the study area (SDP, 2015).

3.3.10 Protected Areas

As noted in Section 3.2 above, the site does not fall within any protected areas defined in the NPAES or South African National Parks (NBA). There are no formal protected areas within 20 km of the proposed site (SDP, 2015). The closest NPAESs are the Gariep NPAES, located 30km to the south-east of the site and the Kamiesberg Bushmanland Augrabies NPAES located 43 km north-west of the site. The Augrabies Falls National Park is approximately 115 km north-west of the site.

3.3.11 Heritage Profile

3.3.11.1 Palaeontology

The study area for the proposed Kenhardt PV 1 project, located on the Farm Onder Rugzeer 168, is situated within the semi-arid Bushmanland region between c. 950 to 900 m above mean sea level (amsl), with a general slope towards the south. It is drained by a dendritic network of shallow, southwest-flowing tributary streams of the Hartbeesrivier, such as the Rugseersrivier in the south and the Wolfkop se Loop in the north (Almond, 2015).

The geology of the study area is shown on 1: 250 000 geology sheet 2920 Kenhardt (Council for Geoscience, Pretoria) (Figure 3.16). The entire area is underlain at depth by a variety of Precambrian basement rocks (c. 2 billion years old) assigned to the Namaqua-Natal Province. These ancient igneous and high-grade metamorphic rocks (mainly granites and gneisses) crop out at surface as small patches and are entirely unfossiliferous. The Precambrian crustal rocks are transected by a NW-SE trending fault zone and lie to the north of the major Wolfkop Fault. A large proportion of the basement rocks are mantled by a range of superficial sediments of Late Caenozoic age, some of which are included within the Kalahari Group. These predominantly thin, unconsolidated deposits include small patches of calcretes (soil limestones), gravelly to sandy river alluvium, pan sediments along certain watercourses, surface gravels, colluvium (scree) as well as - especially - Quaternary to Recent aeolian (wind-blown) sands of the Gordonia Formation (Kalahari Group). Most of these younger rock units are of widespread occurrence and low palaeontological sensitivity. Scientifically important vertebrate fossil remains (e.g. Pleistocene mammalian bones and teeth) have been recorded within older stratified pan and river sediments in the Bushmanland region where they are often associated with stone artefacts, while a limited range of trace fossils (e.g. plant root casts, termitaria and other invertebrate burrows) may be found within calcrete horizons (Almond, 2015).

The PV 1 and PV 1b study areas (Figure 3.16, orange) are underlain by Precambrian basement rocks of the Jacomyns Pan Group and the Keimoes Suite. The basement rocks are largely mantled by aeolian sands of the Gordonia Formation as well as Late Caenozoic alluvial deposits (Almond, 2015).

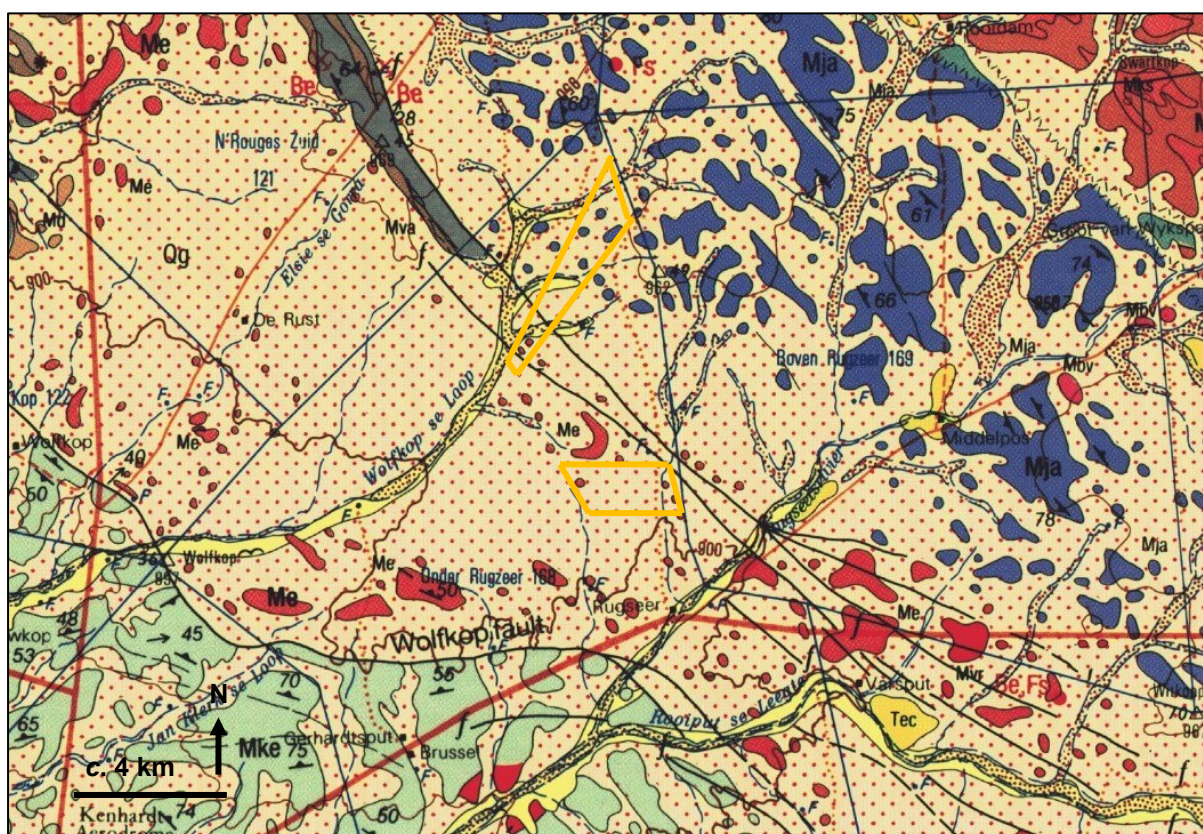


Figure 3.16: Extract from 1: 250 000 scale geological map sheet 2920 Kenhardt (Council for Geoscience, Pretoria) showing the geology of the Scatec Solar PV Facilities study area on Farm Onder Rugzeer 168 situated to the NE of Kenhardt, Northern Cape. The PV 1 and PV 1b study sites are approximately indicated by the two orange polygons in the north and south respectively (Almond, 2015)

The main geological units represented within the broader study region include (Almond, 2015):

Precambrian Basement Rocks

- Keimoes Suite
 - Red (Me) = Elsie se Gorra Granite
- Korannaland Supergroup
 - Brown (Mva) = Valsvlei Formation, Biesje Poort Group
 - Grey (Msa) = Sandputs Formation, Biesje Poort Group
 - Blue (Mja) = Sandnoute Formation, Jacomyns Pan Group
- Vyfbeker Metamorphic Suite
 - Pale blue-green (Mke) = Kenhardt Migmatite

Late Caenozoic Superficial Sediments

- Pale yellow with sparse red stipple (Qg) = aeolian sands of the Gordonia Formation (Kalahari Group)
- Pale yellow with dense red stipple = alluvial and pan sediments
- Dark yellow (Tec) = calcrete

3.3.11.2 Archaeology

In common with much of Bushmanland, the project area is a flat expanse of relatively flat terrain but with many ephemeral drainage lines visible on aerial photography. These drainages affect the various sites and their alternatives to differing degrees. Previous work in the area (Orton 2014a, 2014b, 2014c) suggests that vegetation cover is likely to be very sparse with the ground surface openly visible at all times. Aside from the ephemeral stream lines, Kenhardt PV 1, Kenhardt PV 3 and the three alternative sites all appear to be free of other landscape features. Kenhardt PV 2

contains a small pan in the north, close to the railway line, while a small rocky outcrop lies just outside and to the east of the layout area (ASHA Consulting, 2015).

In terms of expected heritage resources, Bushmanland is well known for the vast expanses of gravel that occur in places and which frequently contain stone artefacts in varying densities (Beaumont, 1995). Such material is referred to as 'background scatter' and is invariably of very limited significance. At times, however, the scatter can become very dense and mitigation work is occasionally called for. The artefacts located in these contexts are largely Early Stone Age (ESA) and Middle Stone Age (MSA) and are not associated with any other archaeological materials - these would have long since decomposed and disappeared. Previous experience immediately east of the present site suggests that such dense accumulations of artefacts are unlikely to occur in this area (ASHA Consulting, 2015).

Of potentially more significance, however, are Later Stone Age (LSA) sites which are commonly located along the margins of water features in Bushmanland. These features include both pans and ephemeral drainage lines. Such sites were identified to the east of the present study area in association with pans but artefact scatters associated with drainage lines were rare (Orton 2014a, 2014b, 2014c). The drainage lines on the present site, however, are more prominent and perhaps more likely to reveal LSA camp sites. These sites would typically contain mostly stone artefacts, but fragments of ostrich eggshell (used as water containers and also as a food source) and pottery are also found at times, while bone is rare and likely confined to sites that are very recent. Similar LSA sites can also be found in association with rocky outcrops but none appear to occur within the present study area. Because of their positions along water courses and adjacent to rocky areas, such sites are often avoided by development proposals because of the need to avoid the relevant natural features. Despite the increased likelihood of locating archaeology along streams, Morris (2009) noted that a search along the banks of the Hartebees River close to Kenhardt, where he expected elevated frequencies of archaeological material, revealed virtually nothing (ASHA Consulting, 2015).

Another kind of archaeological site fairly commonly encountered in Bushmanland is small rock outcrops that have been quarried as a source of stone material for making stone tools. Several such occurrences were noted to the east where quartz outcrops were frequently flaked (Orton 2014a, 2014b, 2014c). In terms of protected species, if dense stands of quiver trees are present it would be advisable to avoid these as they are an iconic feature of the drylands of north-western South Africa. Based on previous research, there are two quiver tree forests located towards the north, on the Gemsbok Bult Farm (ASHA Consulting, 2015).

The built environment is sparsely represented in Bushmanland because the farms tend to be so large. The vast majority of structures appear to be quite recent in age (20th century) and are of very limited heritage significance. In any case, the development will not affect any buildings. Graves are also very rare. Some older farms may have small graveyards located close to their farm buildings but, again, these are highly unlikely to be included within the areas proposed for development. Unmarked pre-colonial graves can, in theory, be located anywhere, although they are generally more common in sandy areas where excavation of graves was easier and in more productive areas where population densities would have been higher. It is highly unlikely that pre-colonial graves would be encountered in the study area (ASHA Consulting, 2015).

Although the Anglo-Boer War was fought across the Northern Cape, there is little of significance in the Kenhardt area (ASHA Consulting, 2015). The town was occupied by the Boers early on 25 February 1900 but they surrendered to the British who occupied the town on 31 March 1900 (Grobler, 2004).

3.3.11.3 Cultural and Natural Landscape (i.e. Visual Baseline)

The cultural and natural landscape should also be considered in terms of heritage significance. However, the cultural landscape is very poorly developed in this area with fences, water troughs and wind pumps being the primary features. The natural landscape lacks visually interesting and sensitive features (ASHA Consulting, 2015).

The proposed sites for the PV plant are in a remote and sparsely populated region with the nearest town, Kenhardt, more than 10 km from the site. Sheep farming is the major agricultural activity and the sites are located on sheep farming land. The Sishen-Saldanha iron ore railway line traverses the properties on which the proposed plants will be built, and passes within 5 km of the proposed solar plant sites (i.e. Kenhardt PV 1, Kenhardt PV 2, and Kenhardt PV 3). The railway line was recently renovated. The Nieuwehoop Substation, currently under construction, is located on the adjacent Remaining Extent of Portion 3 of Gemsbok Bult Farm Number 120. The cultural landscape is of low value and because of the Sishen-Saldanha Railway and the already approved Eskom Nieuwehoop Substation that will be constructed on the farm. The area therefore lends itself to an industrial character to the immediate landscape (Orton, 2014).

The R27, a major road between Cape Town and Upington, is more than 10 km west of the proposed site. The road is relatively busy and tourists visiting towns along the Orange River valley form part of its users. A secondary road, R383, passes more than 10 km from the site and connects Kenhardt with Marydale. Based on the distance between these roads and the proposed site, it is highly unlikely to be visible to anyone other than local residents making use of the gravel road along the railway line. Solar PV facilities are not very tall and, if an earthy coloured paint is used for the buildings, they can be almost invisible from as little as 1 km away (ASHA Consulting, 2015). Several communication towers are visible in the landscape. There are several buildings within 10 km of the proposed development and it is possible that existing views from these may be affected by the proposed development (Holland, 2015).

3.3.12 Socio-Economic Environment

It must be noted that documented data on the study area, particularly in terms of area specific (i.e. Kenhardt and surrounds) socio-economic data, is very limited. Accordingly, the available data is interpreted in terms of professional opinion and generally accepted trends within the study area and South Africa.

3.3.12.1 Demographic Profile

The ZF Mgcawu District Municipality (DM) comprises six Local Municipalities namely: Mier; Kai! Garib; Khara Hais; Tsantsabane, !Kheis and Kgatelopele and is classified as a Category C municipality (Figure 3.17). The ZF Mgcawu DM covers an area of approximately 100 000 km² (almost 30 % of the Province) (ZF Mgcawu DM IDP, 2014) and according to the 2011 Census has approximately 236 783 inhabitants.

The actual project footprint (Remaining Extent of Onder Rugzeer Farm 168) is located within the !Kheis Local Municipality. However, the closest urban center, Kenhardt, is located in the Kai !Garib Local Municipality.

A total of 16 703 households resides in the Kai !Garib Local Municipality, with 35 % of households being female headed. The total female population dominates the total male population by 8.5 % (Kai !Garib Draft IDP, 2014). Population of the working age demographic (i.e. 15 to 65 years) makes-up 70.5 % of the population, whereas those below 15 years of age comprise 24.4 % of the population, and the above 65 years age group makes-up 5.1 % of the population of the Kai !Garib Local Municipality. Accordingly, the dependency ratio (i.e. the economically active population vs. the non-economically active population: 24.4 % + 5.1 %) is 29.5 % (du Toit, 2015).

The !Kheis Local Municipality consists of a total of 4146 households, with 34.6 % of households being female headed. Population of the working age demographic (i.e. 15 to 65 years) makes-up 70.5 % of the population, whereas those below 15 years of age comprises 35 % of the population, and the above 65 years age group makes-up 5.1 % of the population (Statistics SA, 2015).

This data is suggestive of an area with a relatively high level of vulnerable people groups (i.e. woman and children) and, potentially, a corresponding high level of vulnerable households.

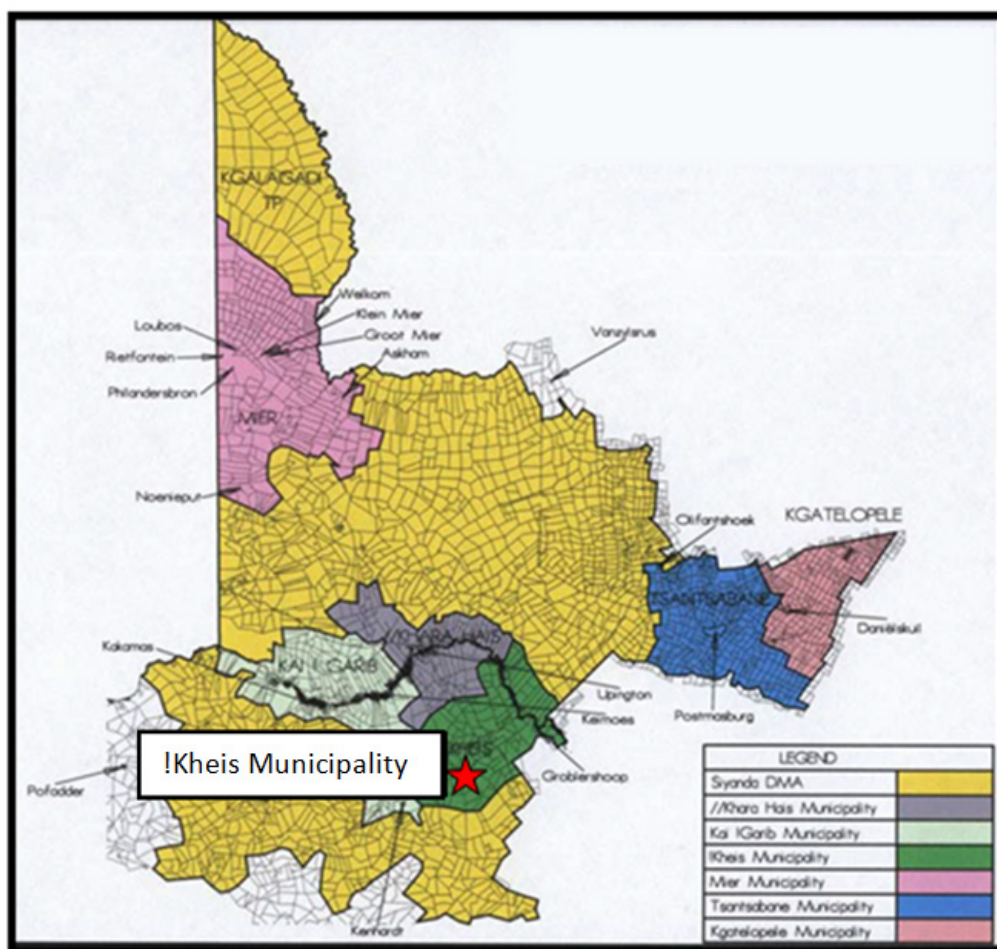


Figure 3.17: Siyanda DM (now known as ZF Mgcawu DM) boundary and boundaries of local municipalities (Siyanda DM IDP, 2013)

The !Kheis Local Municipality, in which the proposed project is located, has a population of 16 637, according to the 2011 Census (Statistics SA, 2015). As shown in Table 3.7, the !Kheis Local Municipality constitutes 8 % of the total population of the ZF Mgcawu DM.

Table 3.7: Population of the Local Municipalities within the ZF Mgcawu DM (Statistics SA, 2011)

Municipality	Census 2001	Census 2011	% of the total population	Difference	Area (Km ²)	Persons / Km ²
Mier	7207	7003	3%	493	22468	0.3
Kai Garib	58 617	65 869	24%	799	26357	2.1
//Kara Hais	77 919	93 494	42%	25249	21780	4.6
!Kheis	16 538	16 637	8%	2797	11107	1.7
Tsatsabane	27 082	35 093	12%	4018	18330	1.5
Kgatelopele	14 743	18 687	9%	6755	2478	8.7
Total	202 106	236 783	100%	35903	102520	2.3

Afrikaans is the dominant language (76.4 %) and Setswana the second largest language (15.8 %) spoken in the ZF Mgcawu DM. Within the !Kheis Local Municipality 94 % of the population speaks Afrikaans and 1.9 % Setswana. The population of the ZF Mgcawu DM is predominantly Coloured (61.2 %), followed by Black Africans (29.8 %) and Whites (8.3 %), with the !Kheis Local Municipality containing a similar racial population group composition (as shown in Figure 3.18).

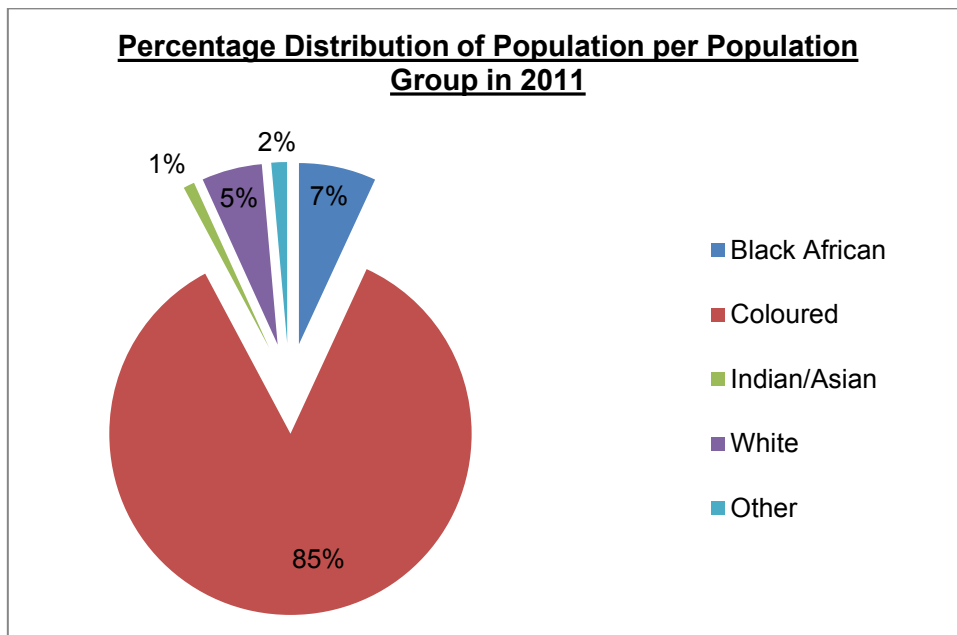


Figure 3.18: Percentage Distribution of Population per Population Group for the !Kheis Local Municipality in 2011 (Statistics South Africa, 2015).

The age distribution of the ZF Mgcawu DM (shown in Figure 3.19 below) is represented by a majority of young people, i.e. persons younger than 40 years old (Statistics SA, 2011).

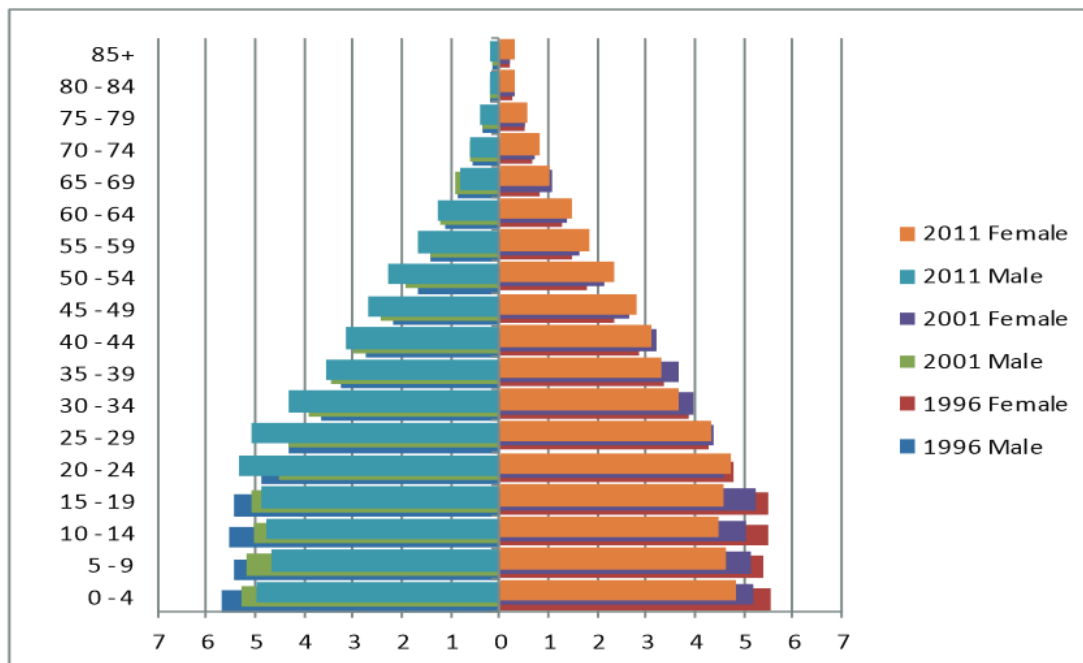


Figure 3.19: Age Distribution of the ZF Mgcawu DM (Statistics South Africa, 2011).

3.3.12.2 Economic Profile

The Northern Cape Province has the third highest per capita income of all nine provinces; however, income distribution is extremely skewed, with a high percentage of the population living in extreme poverty. Approximately 60 % of ZF Mgcawu DM's population has an income of between R 0 to R 800 per month. Approximately 7.7% of the population of the !Kheis Local Municipality has no income, whereas the majority of the population (i.e. 28.30 %) earns between the R 19 601 - R 38 200 income bracket, as shown in Figure 3.20 below.

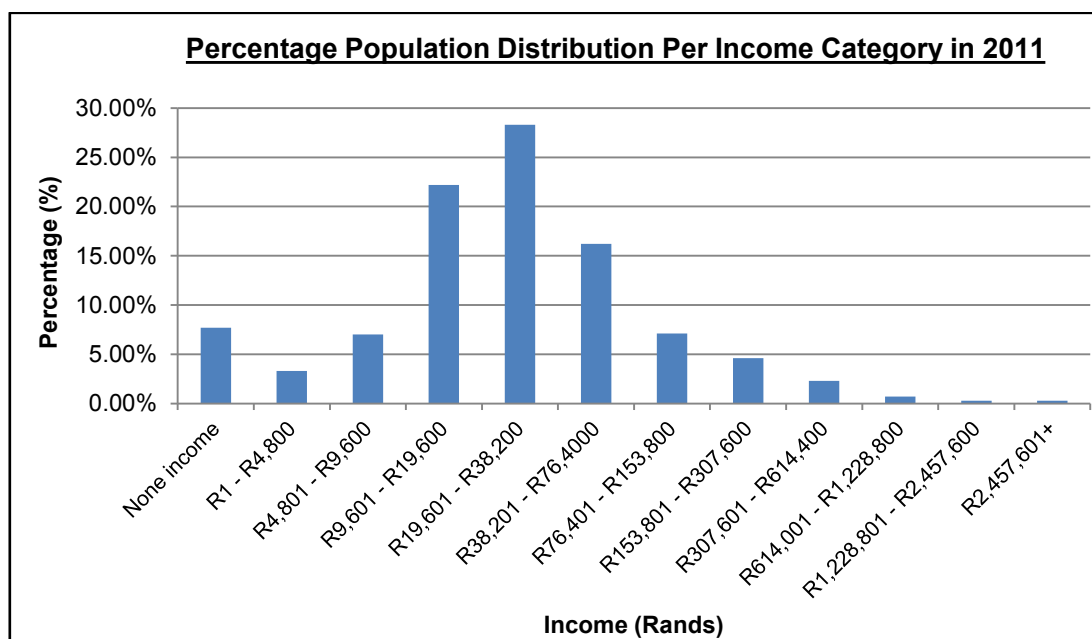


Figure 3.20: Income Distribution of the !Kheis Local Municipality in 2011 (Statistics South Africa, 2015).

The 2011 census indicates that 22 % and 34 % of the economically active population (between the ages of 15-34) in the ZF Mgcawu DM and the !Kheis Local Municipality, respectively, are unemployed. The !Kheis Local Municipality has the highest unemployment percentage of all the local municipalities falling within the ZF Mgcawu DM. Also, nearly a third of the population is economically inactive which suggests that individual and household incomes generated in the study area are being used to support a substantial amount of dependents. This in turn exacerbates the level of household vulnerability in the area.

The unemployment rate for the Kheis Local Municipality in 2001 was 20 % and in 2011 was 28 % (Statistics SA, 2015). The official unemployment rate of 10 % (based on the 2011 Census) has decreased by 6.1 % since the 2001 Census measurement of 16.1 % for the Kai !Garib Local Municipality. The economic sector is dominated by agriculture which provides 51.8 % of jobs, followed by the Community and Government Services sector with 15.9 %. The number of jobs generated by the agricultural sector needs to be interpreted within the context of the Kai !Garib Municipality. The vast majority of the land area occupied by the Kai !Garib Municipality consists of agricultural land, accordingly, it is unsurprising that agriculture would register as the major employer at municipal (i.e. regional) level.

However, the distribution of jobs within urban centers, like Kenhardt, does not necessarily follow this agriculturally dominated pattern. If the prevailing practice of predominantly male-oriented employment within the agricultural sector (specifically in terms of sheep farming) is assumed, the 51.8 % of jobs generated by the agricultural sector could in fact be heavily skewed towards men. This in turn is suggestive of a female dominated population which is heavily dependent on other economic sectors (i.e. non-agricultural sectors) for their income, and could very well imply that

socio-economic impacts on urban centers, like Kenhardt, could be of more significance than farm-based impacts.

In terms of education, only 9.5 % of the total population of ZF Mgcawu DM has no formal schooling, while 13.5 % of the !Kheis Local Municipality’s population is unschooled. Based on the 2011 Census, 3.1 % of the population of the !Kheis Local Municipality has no form of education, 55 % has some primary schooling, 7.5 % completed primary school, 5.7 % completed secondary school and 0.5 % has higher education, as shown in Figure 3.21 below.

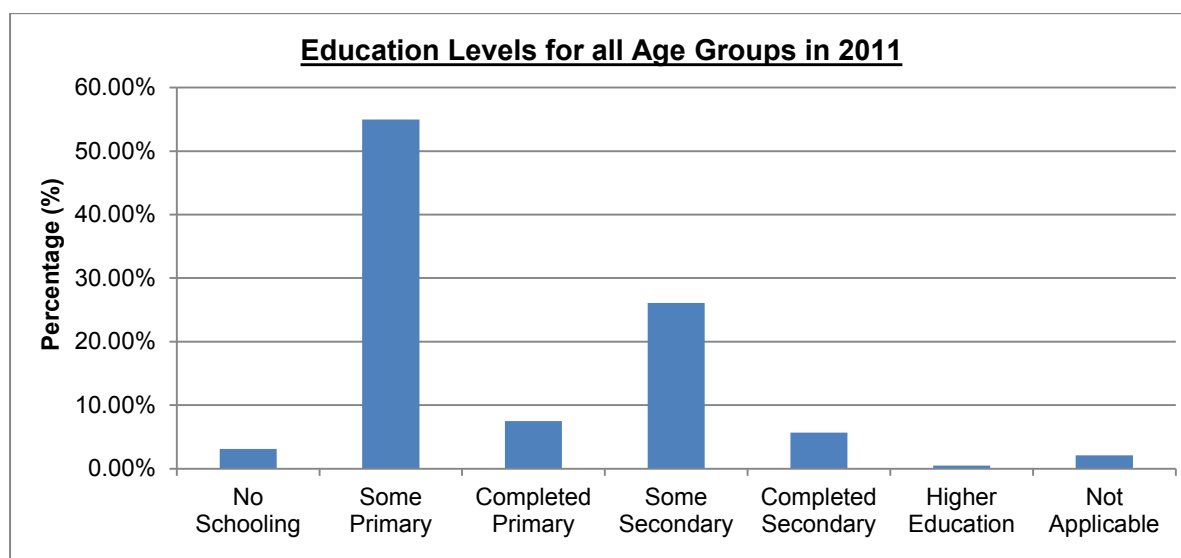


Figure 3.21: Education Levels of the !Kheis Local Municipality in 2011 (Statistics South Africa, 2015).

The economy of the ZF Mgcawu DM is dominated by mining and agriculture and accounts for up to 30 % of the Northern Cape’s economy. Agriculture is the major industry in the district, contributing to job creation and economic growth. The region is characterised by livestock farming which occurs mainly on large farms that are managed for extensive production. The majority of these farms are privately owned. According to the !Kheis Local Municipality’s IDP, the area is ideal for stock-farming, with the main focus being on sheep farming. The stock-farming industry also provides work to local people.

The ZF Mgcawu DM has a unique landscape that has the potential to contribute to and provide for a range of local and international tourist activities and destinations. The main attractions and destinations in the area are the Augrabies Falls National Park and the Kgalagadi Transfrontier Park. The presence of the Orange River is also a tourism asset providing several tourism opportunities. The natural appearance of the area also supports agricultural tourism. The ZF Mgcawu DM IDP indicates that tourism is one of the most important economic sectors in the Northern Cape as well as within the ZF Mgcawu DM boundaries. Tourism is a growing component of the economy of the Northern Cape and the IDP indicates that, after the agricultural sector, the local tourism industry should become the most important economic activity in the area within the next ten years. This is based on the current growth rate in both development and employment.

SCOPING REPORT



CHAPTER 4:

Approach to EIA Process and Public Participation

Scoping and Environmental Impact Assessment for the Proposed Development of a 75 MW Solar Photovoltaic Facility (KENHARDT PV 1) on the remaining extent of Onder Rugzeer Farm 168, north-east of Kenhardt, Northern Cape Province

contents

4	APPROACH TO EIA PROCESS AND PUBLIC PARTICIPATION	4-3
4.1	Legal Context for this EIA	4-3
4.2	Legislation and Guidelines Pertinent to this EIA	4-7
4.2.1	<i>National Legislation</i>	4-7
4.2.1.1	The Constitution of the Republic of South Africa (Act 108 of 1996)	4-7
4.2.1.2	NEMA and EIA Regulations published under Chapter 5 of the NEMA on 8 December 2014 (GN R982, GN R983, GN R984 and GN R985)	4-7
4.2.1.3	National Environmental Management: Biodiversity Act (Act 10 of 2004)	4-8
4.2.1.4	The National Heritage Resources Act (Act 25 of 1999)	4-8
4.2.1.5	National Forests Act (Act 84 of 1998)	4-10
4.2.1.6	Conservation of Agricultural Resources Act (Act 43 of 1983)	4-10
4.2.1.7	National Water Act (Act 36 of 1998)	4-10
4.2.1.8	Astronomy Geographic Advantage (Act 21 of 2007)	4-11
4.2.1.9	Subdivision of Agricultural Land Act (Act 70 of 1970)	4-12
4.2.1.10	Development Facilitation Act (Act 67 of 1995)	4-12
4.2.1.11	Other Applicable Legislation	4-12
4.2.2	<i>Provincial Legislation</i>	4-13
4.2.2.1	Northern Cape Nature Conservation (Act 09 of 2009)	4-13
4.2.2.2	The Provincial Spatial Development Framework for the Northern Cape (Office of the Premier of the Northern Cape, 2012)	4-13
4.2.3	<i>Local Planning Legislation</i>	4-13
4.2.3.1	ZF Mgcawu Spatial Development Framework (Siyanda DM 2012)	4-13
4.2.3.2	!Kheis Rural SDF (!Kheis Municipality 2014)	4-13
4.2.3.3	Kai !Garib SDF (Kai !Garib Municipality 2012)	4-14
4.2.3.4	Guidelines, Frameworks and Protocols	4-14
4.2.4	<i>International Finance Corporation Performance Standards</i>	4-14
4.3	Principles for Scoping and Public Participation	4-15
4.4	Objectives of the Scoping Process	4-16
4.5	Tasks in the Scoping Phase	4-16
4.6	Schedule for the EIA	4-21

tables

Table 4.1:	Listed Activities in GN R982 and GN R983 that potentially form part of the proposed Kenhardt PV 1 project	4-3
Table 4.2:	Newspaper Advertisements Placed for the Commencement of the BA, Scoping and EIA Processes (Kenhardt PV 1, Kenhardt PV 2, Kenhardt PV 3, Kenhardt PV 1 - Transmission Line, Kenhardt PV 2 - Transmission Line and Kenhardt PV 3 - Transmission Line)	4-17
Table 4.3:	Site Notice Boards Placed for the Commencement of the BA, Scoping and EIA Processes (Kenhardt PV 1, Kenhardt PV 2, Kenhardt PV 3, Kenhardt PV 1 - Transmission Line, Kenhardt PV 2 - Transmission Line and Kenhardt PV 3 - Transmission Line)	4-18
Table 4.4:	Schedule for the Proposed Projects (including the Scoping and EIA Projects and the BA Projects)	4-23

figures

Figure 4.1:	Joint PPP proposed for the Kenhardt PV EIA and BA Projects	4-22
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4 APPROACH TO EIA PROCESS AND PUBLIC PARTICIPATION

This chapter presents the EIA Process to be conducted for the proposed development and gives particular attention to the legal context and guidelines that apply to this EIA, the steps in the Scoping and Public Participation component of the EIA (in accordance with Regulations 41, 42, 43 and 44 of GN R982), and the schedule for the EIA Process.

4.1 Legal Context for this EIA

Section 24(1) of the NEMA states:

- *"In order to give effect to the general objectives of integrated environmental management laid down in this Chapter, the potential impact on the environment of listed activities must be considered, investigated, assessed and reported to the competent authority charged by this Act with granting the relevant environmental authorization."*

The reference to "listed activities" in Section 24 of the NEMA relates to the regulations promulgated in GN R982, R983, R984 and R985 in Government Gazette 38282, dated 4 December 2014, which came into effect on 8 December 2014. The relevant Government Notices published in terms of the NEMA collectively comprise the NEMA EIA Regulations listed activities that require either a Basic Assessment, or Scoping and EIA (that is a "full EIA") be conducted. As noted in Chapter 1 of this Scoping Report, the proposed project requires a full EIA, as it particularly includes, *inter alia*, the inclusion of Listed Activity Number 1 in GN R984:

- *"The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs within an urban area"*.

All the listed activities potentially forming part of this proposed development and therefore requiring EA were included in the Application Form for EA that was prepared and submitted to the DEA. At the time of release of this Scoping Report to I&APs for review, the letter of acknowledgement from the DEA stipulating the DEA EIA Reference Number for the proposed project was pending. A copy of the Application Form and the letter of acknowledgement from the DEA will be included as an appendix to the Scoping Report that will be submitted to the DEA for decision-making (in accordance with Regulation 21 (1) of the 2014 EIA Regulations) (if this has been provided by the DEA). The listed activities potentially triggered by the proposed project are indicated in Table 4.1.

Table 4.1: Listed Activities in GN R982 and GN R983 that potentially form part of the proposed Kenhardt PV 1 project

Listed Activity Number	Listed Activity Description	Description of the project activity that potentially triggers the relevant listed activity
GN R983		
Activity 9 (i) and (ii)	<p>The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water:</p> <p>(i) with an internal diameter of 0,36 metres or more; or</p> <p>(ii) with a peak throughput of 120 litres per second or more;</p> <p>excluding where:</p>	<p>The proposed solar PV facility will be constructed on the remaining extent of Onder Rugzeer Farm 168, approximately 80 km south of Upington and 30 km north-east of Kenhardt within the !Kheis Local Municipality, Northern Cape Province. Hence the proposed project will take place outside of an urban area.</p> <p>The proposed project will entail the construction of stormwater channels and water pipelines.</p>

Listed Activity Number	Listed Activity Description	Description of the project activity that potentially triggers the relevant listed activity
	<p>a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve; or</p> <p>b) where such development will occur within an urban area.</p>	<p>These structures may exceed 1000 m in length, may have an internal diameter of 0.36 m or more, and possibly a peak throughput of 120 l/s or more.</p> <p>Water pipelines may need to be constructed in order to transfer groundwater from existing boreholes to the proposed solar facility. The Project Applicant intends to make use of existing boreholes to source groundwater (if available and if suitable) for the solar panel cleaning process. The groundwater will be stored on site in suitable containers or reservoir tanks (or similar) during the operational phase.</p> <p><u>The Geohydrological Assessment, which will be undertaken during the EIA Phase, will confirm whether the groundwater is sufficient and suitable for use.</u></p>
Activity 10 (i) and (ii)	<p>The development and related operation of infrastructure exceeding 1000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes:</p> <p>(i) with an internal diameter of 0,36 metres or more; or</p> <p>(ii) with a peak throughput of 120 litres per second or more;</p> <p>excluding where -</p> <p>a) such infrastructure is for bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve; or</p> <p>b) where such development will occur within an urban area.</p>	<p>The proposed project may entail the construction drainage structures (i.e. French drains) for the transfer of waste water generated by the proposed facility. These structures may exceed 1000 m in length, may have an internal diameter of 0.36 m or more, and possibly a peak throughput of 120 l/s or more.</p> <p>As previously noted, the proposed solar PV facility will be constructed on the remaining extent of Onder Rugzeer Farm 168, approximately 80 km south of Upington and 30 km north-east of Kenhardt within the !Kheis Local Municipality, Northern Cape Province. Hence the proposed project will take place outside of an urban area.</p>
Activity 12 (x) and (xii)	<p>The development of:</p> <p>(x) buildings exceeding 100 square metres in size;</p> <p>(xii) infrastructure or structures with a physical footprint of 100 square metres or more;</p> <p>where such development occurs-</p> <p>a) within a watercourse;</p> <p>b) in front of a development setback; or</p> <p>c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;</p> <p>excluding-</p> <p>(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</p>	<p>The proposed solar PV facility will be constructed on the remaining extent of Onder Rugzeer Farm 168, approximately 80 km south of Upington and 30 km north-east of Kenhardt within the !Kheis Local Municipality, Northern Cape Province. Hence the proposed project will take place outside of an urban area.</p> <p>The proposed 75 MW Solar PV facility will entail the construction of building infrastructure and structures (such as the solar field, offices, workshop, ablution facilities, on-site substation, laydown area and security enclosures etc.). Based on the preliminary sensitivity screening undertaken for the site, two rivers flow through the farm (as shown in Figure 3.2 in Chapter 3 of this Scoping Report) and the buildings and infrastructure are expected to exceed a footprint of 100 m² and some are likely to occur within 32 m of the watercourses.</p>

Listed Activity Number	Listed Activity Description	Description of the project activity that potentially triggers the relevant listed activity
	<p>(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</p> <p>(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;</p> <p>(dd) where such development occurs within an urban area; or</p> <p>(ee) where such development occurs within existing roads or road reserves.</p>	<p><i>Additional information regarding the presence of watercourses on site will be provided in the Ecological Impact Assessment, which will be undertaken during the EIA Phase.</i></p>
Activity 19 (i)	<p>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from -</p> <p>(i) a watercourse;</p> <p>(ii) the seashore; or</p> <p>(iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater,</p> <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving-</p> <p>a) will occur behind a development setback;</p> <p>b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or</p> <p>c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.</p>	<p>The proposed project may entail the excavation, removal and moving of more than 5 m³ of soil, sand, pebbles or rock from the nearby watercourses. The proposed project may also entail the infilling of more than 5 m³ of material into the nearby watercourses. Based on the preliminary sensitivity screening undertaken for the site, two rivers flow through the farm (as shown in Figure 3.2 in Chapter 3 of this Scoping Report). Construction of the internal gravel access road and/or the construction of infrastructure within drainage lines may require the removal of material.</p> <p><i>Additional information regarding the presence of watercourses on site will be provided in the Ecological Impact Assessment, which will be undertaken during the EIA Phase. Confirmation regarding whether material will be infilled or excavated from the watercourses will be provided in the EIA Report.</i></p>
Activity 24 (ii)	<p>The development of -</p> <p>(ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;</p> <p>but excluding -</p> <p>a) roads which are identified and included in activity 27 in Listing Notice 2 of 2014; or</p> <p>b) roads where the entire road falls within an urban area.</p>	<p>Existing roads (such as a private Transnet Service Road or an unnamed farm road) will be used to gain access to the preferred site. The Transnet Service Road can be accessed from the R27 and the farm road can be accessed from the R383 Regional Road also via the R27 National Road.</p> <p>An internal gravel road may be constructed from either the Transnet Service Road or the unnamed farm road to the proposed project site. The internal gravel road is not expected to exceed 6 m in width. The length of the internal gravel road will be confirmed as the location, design and layout of the facility progresses.</p> <p>The proposed solar PV facility will be constructed on the remaining extent of Onder Rugzeer Farm 168, approximately 80 km south of Upington and 30 km north-east of Kenhardt within the !Kheis Local Municipality, Northern Cape Province. Hence the proposed project will take place outside of an urban area.</p>
Activity 28 (ii)	<p>Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development:</p>	<p>The proposed project will take place on the remaining extent of Onder Rugzeer Farm 168, north-east of Kenhardt in the Northern Cape. It is understood that the land is currently used for agricultural purposes (mainly grazing). The</p>

Listed Activity Number	Listed Activity Description	Description of the project activity that potentially triggers the relevant listed activity
	(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.	proposed 75 MW solar PV facility (i.e. Kenhardt PV 1), which is considered to be a commercial/industrial development, will have an estimated footprint of approximately 250 ha. The Kenhardt PV 1, PV 2 and PV 3 proposed projects will have a collective footprint of approximately 750 ha.
GN R984		
Activity 1	The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs within an urban area.	The proposed project will entail the construction of a 75 MW Solar PV facility (i.e. facility for the generation of electricity from a renewable resource). The proposed project will be constructed on the remaining extent of Onder Rugzeer Farm 168, approximately 80 km south of Upington and 30 km north-east of Kenhardt within the !Kheis Local Municipality, Northern Cape Province. Hence the proposed project will take place outside of an urban area.
Activity 15	The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for: (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	The proposed 75 MW solar PV facility (i.e. Kenhardt PV 1) will have an estimated footprint of approximately 250 ha. The Kenhardt PV 1, PV 2 and PV 3 proposed projects will have a collective footprint of approximately 750 ha. As a result, more than 20 ha of indigenous vegetation could possibly be removed for the construction of the proposed Solar PV facility. <i>Additional information regarding the presence of indigenous vegetation on site will be provided in the Ecological Impact Assessment, which will be undertaken during the EIA Phase.</i>

Notes regarding the identification of potential listed activities:

- It should be noted that a precautionary approach was followed when identifying listed activities (for inclusion in the Application for EA and to be assessed as part of the Scoping and EIA Process), i.e. if the activity potentially forms part of the project, it is listed. However, the final project description will be shaped by the findings of the EIA Process and certain activities may be added or removed from the project proposal. The DEA and I&APs will be informed in writing of such amendments accordingly.
- Based on the preliminary sensitivity screening undertaken for the site, the proposed project area does not fall within any threatened ecosystems, National Protected Areas, National Protected Area Expansion Strategy Focus Areas or areas of conservation planning. The closest protected area is approximately 113 km away from the proposed project site. An Ecological Support Area (i.e. a buffer around the Hartbees River) is located approximately 14 km west of proposed project as part of the Namakwa District Biodiversity Sector Plan. Furthermore, there is no conservation plan for the !Kheis Local Municipality and the ZF Mgcauw District Municipality, hence Critical Biodiversity Areas are not present or defined. Therefore, the listed activities relating to specific geographic areas contained in GN R985 of the 2014 NEMA EIA Regulations do not apply to the proposed project at this stage. However, this will be confirmed during the EIA Phase as part of the relevant specialist studies.
- It is proposed that less than 30 m³ of dangerous goods (such as petrol and diesel) will be temporarily stored on site during the construction phase. Furthermore, no infrastructure or structures are planned to be specifically constructed for the aforementioned temporary storage. Recommendations for the temporary storage of petrol and diesel on site during the construction phase will be provided in the EMPr.
- The relevant listed activities applicable to the construction of the proposed transmission lines and associated electrical infrastructure at the Eskom Nieuwehoop Substation will be included in

the separate BA Reports and the Applications for EA for the BA Processes. As mentioned previously, the Applications for EA for the BA Processes will be lodged with the DEA during the EIA Phase, in order to comply with the timeframes stipulated in Regulation 19 (1) of GN R982.

4.2 Legislation and Guidelines Pertinent to this EIA

The scope and content of this Scoping Report has been informed by the following legislation, guidelines and information series documents:

4.2.1 National Legislation

4.2.1.1 *The Constitution of the Republic of South Africa (Act 108 of 1996)*

The Constitution, which is the supreme law of the Republic of South Africa, provides the legal framework for legislation regulating environmental management in general, against the backdrop of the fundamental human rights. Section 24 of the Constitution states that:

- “Everyone has the right:
 - to an environment that is not harmful to their health or well-being; and
 - to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that -
 - prevent pollution and ecological degradation;
 - promote conservation; and
 - secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”

Section 24 of the Bill of Rights therefore guarantees the people of South Africa the right to an environment that is not detrimental to human health or well-being, and specifically imposes a duty on the State to promulgate legislation and take other steps that ensure that the right is upheld and that, among other things, ecological degradation and pollution are prevented.

In support of the above rights, the environmental management objectives of proposed project is to protect ecologically sensitive areas and support sustainable development and the use of natural resources, whilst promoting justifiable socio-economic development in the towns nearest to the project site.

4.2.1.2 *NEMA and EIA Regulations published under Chapter 5 of the NEMA on 8 December 2014 (GN R982, GN R983, GN R984 and GN R985)*

The NEMA sets out a number of principles (Chapter 1, Section 2) to give guidance to developers, private land owners, members of public and authorities. The proclamation of the NEMA gives expression to an overarching environmental law. Various mechanisms, such as cooperative environmental governance, compliance and non-compliance, enforcement, and regulating government and business impacts on the environment, underpin NEMA. NEMA, as the primary environmental legislation, is complemented by a number of sectoral laws governing marine living resources, mining, forestry, biodiversity, protected areas, pollution, air quality, waste and integrated coastal management. Principle number 3 determines that a development must be socially, environmentally and economically sustainable. Principle Number 4(a) states that all relevant factors must be considered, inter alia i) that the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied; ii) that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied; vi) that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised; and viii) that negative impacts on the environment and on peoples’ environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.

4.2.1.3 National Environmental Management: Biodiversity Act (Act 10 of 2004)

The National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA) provides for “the management and conservation of South Africa’s biodiversity within the framework of the NEMA, the protection of species and ecosystems that warrant national protection, and the use of indigenous biological resources in a sustainable manner, amongst other provisions”. The Act states that the state is the custodian of South Africa’s biological diversity and is committed to respect, protect, promote and fulfil the constitutional rights of its citizens.

Furthermore, NEMBA states that the loss of biodiversity through habitat loss, degradation or fragmentation must be avoided, minimised or remedied. The loss of biodiversity includes inter alia the loss of threatened or protected species. Biodiversity offsets are a means of compensating for the loss of biodiversity after all measures to avoid, reduce or remedy biodiversity loss have been taken, but residual impacts still remain and these are predicted to be medium to high. Chapter 5 of NEMBA (Sections 73 to 75) regulates activities involving invasive species, and lists duty of care as follows:

- the land owner/land user must take steps to control and eradicate the invasive species and prevent their spread, which includes targeting offspring, propagating material and regrowth, in order to prevent the production of offspring, formation of seed, regeneration or re-establishment;
- take all required steps to prevent or minimise harm to biodiversity; and
- ensure that actions taken to control/eradicate invasive species must be executed with caution and in a manner that may cause the least possible harm to biodiversity and damage to the environment.

An amendment to the NEMBA has been promulgated, which lists 225 threatened ecosystems based on vegetation types present within these ecosystems. Should a project fall within a vegetation type or ecosystem that is listed, actions in terms of NEMBA are triggered. Based on the preliminary sensitivity screening undertaken for the proposed site, none of the threatened ecosystems occur within the study area. This will be confirmed as part of the Ecological Impact Assessment study undertaken during the EIA Phase.

4.2.1.4 The National Heritage Resources Act (Act 25 of 1999)

The National Heritage Resources Act (Act 25 of 1999) (NHRA) introduces an integrated and interactive system for the managements of national heritage resources (which include landscapes and natural features of cultural significance).

Parts of sections 35(4), 36(3) (a) and 38(1) (8) of the NHRA apply to the proposed project:

Archaeology, palaeontology and meteorites:

Section 35 (4) No person may, without a permit issued by the responsible heritage resources authority:

- a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
- b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
- c) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

Burial grounds and graves:

Section 36 (3) (a) No person may, without a permit issued by South African Heritage Resources Agency (SAHRA) or a provincial heritage resources authority:

- a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

- b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
- c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

Heritage resources management:

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorized as:

- a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- b) the construction of a bridge or similar structure exceeding 50 m in length;
- c) any development or other activity which will change the character of the site -
 - (i) exceeding 5000 m² in extent, or
 - (ii) involving three or more erven or subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA, or a provincial resources authority;
- d) the re-zoning of a site exceeding 10 000 m² in extent; or
- e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

While landscapes with cultural significance do not have a dedicated Section in the NHRA, they are protected under the definition of the National Estate (Section 3). Section 3(2)(c) and (d) list “historical settlements and townscapes” and “landscapes and natural features of cultural significance” as part of the National Estate. Furthermore, Section 3(3) describes the reasons a place or object may have cultural heritage value. Section 38 (2a) of the NHRA states that if there is reason to believe that heritage resources will be affected then an impact assessment report must be submitted.

A Heritage Impact Assessment (including Archaeology and Cultural Landscape) and a desktop Palaeontological Impact Assessment will be undertaken during the EIA Phase of the proposed project. These relevant specialist studies will be included in the EIA Reports that will be released to I&APs for review during the EIA Phase.

Ngwao-Boswa Ya Kapa Bokoni (Heritage Northern Cape) and the SAHRA are required to provide comment on the proposed project in order to facilitate final decision-making by the DEA. To this end and to facilitate comment from the relevant heritage authorities, the proposed project was loaded onto the South African Heritage Resources Information System (SAHRIS) on 30 and 31 July 2015. An application was created for each project and all necessary project information (including the BID, Letter 1, and Comment and Registration Form) was uploaded to the SAHRIS. The following Case Reference Numbers were allocated to the proposed projects:

- Kenhardt PV 1: 8204;
- Kenhardt PV 2: 8205;
- Kenhardt PV 3: 8206;
- Kenhardt PV 1 - Transmission Line: 8207;
- Kenhardt PV 2 - Transmission Line: 8208; and
- Kenhardt PV 3 - Transmission Line: 8209.

Once a final comment has been issued by the heritage authority, the recommendations should be included in the conditions of the EA (should it be granted). This will essentially give ‘permission’ from the heritage authorities to proceed. If any archaeological mitigation is required then this would need to be conducted by an appropriate specialist under a permit issued to that specialist by

SAHRA. This permit has no bearing on the developer or development but is purely a way in which the heritage authority can be sure that the mitigation work will be carried out satisfactorily.

4.2.1.5 National Forests Act (Act 84 of 1998)

The National Forest Act (Act 84 of 1998) allows for the protection of certain tree species. The Minister has the power to declare a particular tree to be a protected tree. According to Section 12 (1) d (read with Sections (5) 1 and 62 (2) (c)) of the National Forest Act (Act 84 of 1998), a licence is required to remove, cut, disturb, damage or destroy any of the listed protected trees. The most recent list of protected tree species was published in November 2014. The Department of Agriculture, Forestry and Fisheries (DAFF) is authorised to issue licences for any removal, cutting, disturbance, damage to or destruction of any protected trees. The protected trees that commonly occur in this region are *Acacia erioloba* and *Boscia albitrunca*. The presence of these trees on site will be confirmed as part of the Ecological Impact Assessment to be conducted during the EIA Phase.

4.2.1.6 Conservation of Agricultural Resources Act (Act 43 of 1983)

The objectives of the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) are to provide for the conservation of the natural agricultural resources of South Africa by the:

- maintenance of the production potential of land;
- combating and prevention of erosion and weakening or destruction of the water sources; and
- protection of the vegetation and the combating of weeds and invader plants.

The CARA states that no land user shall utilise the vegetation of wetlands (a watercourse or pans) in a manner that will cause its deterioration or damage. This includes cultivation, overgrazing, diverting water run-off and other developments that damage the water resource. The CARA includes regulations on alien invasive plants. According to the amended regulations (GN R280 of March 2001), declared weeds and invader plants are divided into three categories:

- Category 1 may not be grown and must be eradicated and controlled,
- Category 2 may only be grown in an area demarcated for commercial cultivation purposes and for which a permit has been issued, and must be controlled, and
- Category 3 plants may no longer be planted and existing plants may remain as long as their spread is prevented, except within the flood line of watercourses and wetlands. It is the legal duty of the land user or land owner to control invasive alien plants occurring on the land under their control.

Should alien plant species occur within the study area; this will be managed in line with the EMPr. Rehabilitation after disturbance to agricultural land is also managed by CARA. The DAFF reviews and approves applications in terms of these Acts according to their Guidelines for the evaluation and review of applications pertaining to renewable energy on agricultural land, dated September 2011.

4.2.1.7 National Water Act (Act 36 of 1998)

One of the important objectives of the National Water Act (Act 36 of 1998) (NWA) is to ensure the protection of the aquatic ecosystems of South Africa's water resources. Section 21 of this Act identifies certain land uses, infrastructural developments, water supply/demand and waste disposal as 'water uses' that require authorisation (licensing) by the Department of Water and Sanitation (DWS). Chapter 4 (Part 1) of the NWA sets out general principles for the regulation of water use. Water use is defined broadly in the NWA, and includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering the bed, banks, course or characteristics of a watercourse, removing water found underground for certain purposes, and recreation. In general a water use must be licensed unless it is listed in Schedule I, is an existing lawful use, is permissible under a general authorisation, or if a responsible authority waives the need for a licence. The Minister may limit the amount of water which a responsible authority may allocate. In making

regulations the Minister may differentiate between different water resources, classes of water resources and geographical areas.

All water users who are using water for agriculture: aquaculture, agriculture: irrigation, agriculture: watering livestock, industrial, mining, power generation, recreation, urban and water supply service must register their water use. This covers the use of surface and ground water.

Section 21 of the Act lists the following water uses that need to be licensed:

- a) taking water from a water resource;
- b) storing water;
- c) impeding or diverting the flow of water in a watercourse;
- d) engaging in a stream flow reduction activity contemplated in section 36;
- e) engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
- f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- g) disposing of waste in a manner which may detrimentally impact on a water resource;
- h) disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- i) altering the bed, banks, course or characteristics of a watercourse;
- j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- k) using water for recreational purposes.

Any activities that take place within a water course or within 500 m of a wetland boundary require a Water Use Licence (WUL) under the Section 21 (c) and Section 21 (i) of the NWA. The need for a Water Use Licence will be determined as part of the Ecological Impact Assessment, which will be conducted during the EIA Phase. However, it is important to note that considerable efforts will be made to place the proposed solar field and project infrastructure outside of wetland areas. The DWS will be consulted with during the EIA Process to confirm the need for a WUL, as well as to seek comment on the proposed project.

4.2.1.8 Astronomy Geographic Advantage (Act 21 of 2007)

The Astronomy Geographic Advantage (Act 21 of 2007) aims to provide for:

- the preservation and protection of areas within the Republic that are uniquely suited for optical and radio astronomy;
- intergovernmental co-operation and public consultation on matters concerning nationally significant astronomy advantage areas; and
- matters connected therewith.

The overall purpose of the Act is to preserve the geographic advantage areas that attract investment in astronomy. The entire Northern Cape Province, excluding the Sol Plaatjie Municipality, has been declared an astronomy advantage area. The South African MeerKAT radio telescope is currently being constructed about 90 km north-west of Carnarvon in the Northern Cape Province. The MeerKAT radio telescope is a precursor to the Square Kilometre Array (SKA) telescope and will be integrated into the SKA Phase 1 (SKA South Africa, 2014).

The proposed Kenhardt PV 1 project is located approximately 30 km north-east of Kenhardt. Kenhardt is located approximately 220 km from Carnarvon. According to the SKA Project Office, the nearest SKA station has been identified as SKA Station ID 2362, at approximately 20 km from the proposed project. The SKA office will be contacted during the EIA Phase to confirm whether the proposed project in Kenhardt poses a risk to the SKA project. The SKA have been pre-identified as a key stakeholder and therefore included on the project database of I&APs (as shown in Appendix C of this Scoping Report). As such, the SKA office was provided with a copy of the BID, Letter 1, and Comment and Registration Form during the Project Initiation Phase. Comments received from the SKA Project Office are included in Appendix G and Chapter 7 of this Scoping Report.

According to the SKA, based on distance to the nearest SKA station, the location of the station, and the information currently available on the design of the PV installation, the proposed facility poses a medium to high risk of detrimental impact on the SKA. Furthermore, Electro Magnetic Interference and Radio Frequency Interference studies will be undertaken to determine appropriate mitigation and management measures to reduce the risk of a detrimental impact on the SKA project. These studies will be included in the EIA Report.

4.2.1.9 Subdivision of Agricultural Land Act (Act 70 of 1970)

A change of land use (re-zoning) for the development on agricultural land needs to be approved in terms of the Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA). This is required for long term lease, even if no subdivision is required.

4.2.1.10 Development Facilitation Act (Act 67 of 1995)

The Development Facilitation Act (Act 67 of 1995) (DFA) sets out a number of key planning principles which have a bearing on assessing proposed developments in light of the national planning requirements. The planning principles most applicable to the study area include:

- Promoting the integration of the social, economic, institutional and physical aspects of land development;
- Promoting integrated land development in rural and urban areas in support of each other;
- Promoting the availability of residential and employment opportunities in close proximity to or integrated with each other;
- Optimising the use of existing resources including such resources relating to agriculture, land, minerals, bulk infrastructure, roads, transportation and social facilities;
- Contributing to the correction of the historically distorted spatial patterns of settlement in the Republic and to the optimum use of existing infrastructure in excess of current needs;
- Promoting the establishment of viable communities; and
- Promoting sustained protection of the environment.

4.2.1.11 Other Applicable Legislation

Other applicable national legislation that may apply to the proposed project include:

- Electricity Act (Act 41 of 1987);
- Electricity Regulations Amendments (August 2009);
- Energy Efficiency Strategy of the Republic of South Africa (Department of Minerals and Energy (DME) now operating as Department of Mineral Resources (DMR), March, 2005);
- Promotion of Administrative Justice Act (Act 2 of 2000);
- Civil Aviation Act (Act 13 of 2009) and Civil Aviation Regulations (CAR) of 1997;
- Civil Aviation Authority Act (Act 40 of 1998);
- White Paper on Renewable Energy (2003);
- Integrated Resource Plan for South Africa (2010);
- Occupational Health and Safety Act (Act 85 of 1993), as amended by Occupational Health and Safety Amendment (Act 181 of 1993);
- Fencing Act (Act 31 of 1963);
- National Environmental Management: Air Quality Act (Act 39 of 2004);
- National Environmental Management: Protected Areas Act (NEM:PA) (Act 31 of 2004);
- National Environmental Management: Waste Management Act (Act 59 of 2008); and
- National Road Traffic Act (Act 93 of 1996).

4.2.2 Provincial Legislation

4.2.2.1 Northern Cape Nature Conservation (Act 09 of 2009)

The Northern Cape Nature Conservation Act (Act 09 of, 2009) and in particular the Northern Cape Conservation: Schedule 2 - Specially Protected Species has reference to the proposed project. This Act aims at improving the sustainability in terms of balancing natural resource usage and protection or conservation thereof. It includes six schedules, as follows:

- Schedule 1 - Specially Protected species;
- Schedule 2 - Protected species;
- Schedule 3 - Common indigenous species;
- Schedule 4 - Damage causing animal species;
- Schedule 5 - Pet species; and
- Schedule 6 - Invasive Species.

With regards to protected flora, the Northern Cape Nature Conservation Act includes a list of protected flora. The plant species potentially present within the proposed project area will be identified as part of the Ecological Impact Assessment specialist study. However, it will be recommended as part of the EMP, that a detailed plant search and rescue operation be conducted before the final design process and prior to the commencement of the construction phase. If any of the listed species are found, the relevant permits should be obtained by the Project Applicant prior to their relocation or destruction. In addition, the Provincial Department of Environment and Nature Conservation should be consulted on whether a permit is required for the clearance of indigenous vegetation on site. The Provincial Department of Environment and Nature Conservation have been pre-identified as a key stakeholder and therefore included on the project database (as shown in Appendix C of this Scoping Report). As such, the Provincial Department of Environment and Nature Conservation were provided with a copy of the BID, Letter 1, and Comment and Registration Form during the Project Initiation Phase.

4.2.2.2 The Provincial Spatial Development Framework for the Northern Cape (Office of the Premier of the Northern Cape, 2012)

The Provincial Spatial Development Framework (PSDF) identified a Solar Corridor where solar projects will be given priority. According to the PSDF, this Solar Corridor “centres around Upington and extends from roughly Kakamas in the north to De Aar in the east” (Department of Co-operative Governance, Human Settlements and Traditional Affairs, 2012, Page 68). The proposed Kenhardt PV 1 project does not fall within this corridor.

4.2.3 Local Planning Legislation

4.2.3.1 ZF Mgcawu Spatial Development Framework (Siyanda DM 2012)

The Solar Corridor is seen as an initiative that ‘should be pursued vigorously.’ The corridor follows the main routes from Prieska to Upington and further along the N10. However, the Spatial Development Framework (SDF) map (Page 221) shows that the corridor also extended along the N14 west. There are also a number of solar energy projects outside these corridors. Proposal SB7 for Southern Bushmanland relates to solar projects: “Sensitively place solar projects within the Solar Corridor with due regard to the visual impact of these facilities and the siting principles in Section 6.3.7”. Siting principles address wind farms rather than solar plants.

4.2.3.2 !Kheis Rural SDF (!Kheis Municipality 2014)

Natural scenic beauty of the municipality and production of solar energy are both seen as opportunities based on its existing bio-physical conditions. Tourism opportunities for this municipality potentially relevant to the proposed development include agricultural tourism, landscape tourism and game farms. Solar energy projects are suggested for the remote areas of the municipality although no indication is given where this should be (other than the Solar Corridor).

4.2.3.3 Kai !Garib SDF (Kai !Garib Municipality 2012)

Kenhardt and its surrounding rural area are seen as an agricultural region with a scenic environment and important cultural heritage. Dust pollution is seen as factor that “must be taken into consideration with future developments”. Solar projects are mainly located along the Orange River and within the Solar Corridor, but there are projects south-west of Kenhardt indicated on the resources map.

4.2.3.4 Guidelines, Frameworks and Protocols

- Public Participation Guideline, October 2012 (Government Gazette 35769);
- DEADP and DEA Guidelines published in terms of the NEMA EIA Regulations, in particular:
 - Guideline on Transitional Arrangements (DEADP, March 2013);
 - Guideline on Alternatives (DEADP, March 2013);
 - Guideline on Public Participation (DEADP, March 2013); and
 - Guideline on Need and Desirability (DEADP, March 2013);
- Information Document on Generic Terms of Reference for EAPs and Project Schedules (March 2013);
- Integrated Environmental Management Information Series (Booklets 0 to 23) (Department of Environmental Affairs and Tourism (DEAT), 2002 - 2005);
- Guidelines for Involving Specialists in the EIA Processes Series (DEADP; CSIR and Tony Barbour, 2005 - 2007);
- United Nations Framework Convention on Climate Change (1997); and
- Kyoto Protocol (which South Africa acceded to in 2002).

4.2.4 International Finance Corporation Performance Standards

In order to promote responsible environmental stewardship and socially responsible development, the proposed Kenhardt PV 1 project will, as far as practicable, incorporate the environmental and social policies of the International Finance Corporation (IFC). These policies provide a frame of reference for lending institutions to review of environmental and social risks of projects, particularly those undertaken in developing countries.

Through the Equator Principles, the IFC’s standards are now recognised as international best practice in project finance. The IFC screening process categorises projects into A, B or C in order to indicate relative degrees of environmental and social risk. The categories are:

- Category A - Projects expected to have significant adverse social and/or environmental impacts that are diverse, irreversible, or unprecedented.
- Category B - Projects expected to have limited adverse social and/or environmental impacts that can be readily addressed through mitigation measures.
- Category C - Projects expected to have minimal or no adverse impacts, including certain financial intermediary projects.

Accordingly, projects such as the proposed Kenhardt PV 1 project are categorised as Category B projects. The EA Process for Category B projects examines the project’s potential negative and positive environmental impacts and compares them with those of feasible alternatives (including the ‘without project’ scenario). As required for Category B projects a Scoping and EIA Process is being undertaken for the Kenhardt PV 1 project

Other Acts, standards and/or guidelines which may also be applicable will be reviewed in more detail as part of the specialist studies to be conducted for the EIA.

4.3 Principles for Scoping and Public Participation

The PPP for this Scoping and EIA Process is being driven by a stakeholder engagement process that will include inputs from authorities, I&APs, technical specialists and the project proponent. Guideline 4 on “Public Participation in support of the EIA Regulations” published by DEAT in May 2006, states that public participation is one of the most important aspects of the EA Process. This stems from the requirement that people have a right to be informed about potential decisions that may affect them and that they must be afforded an opportunity to influence those decisions. Effective public participation also improves the ability of the Competent Authority (CA) to make informed decisions and results in improved decision-making as the view of all parties are considered.

An effective PPP could therefore result in stakeholders working together to produce better decisions than if they had worked independently.

- “Provides an opportunity for I&APs, EAPs and the CA to obtain clear, accurate and understandable information about the environmental impacts of the proposed activity or implications of a decision;
 - Provides I&APs with an opportunity to voice their support, concern and question regarding the project, application or decision;
 - Enables an applicant to incorporate the needs, preferences and values of affected parties into its application;
 - Provides opportunities for clearing up misunderstanding about technical issues, resolving disputes and reconciling conflicting interests;
 - Is an important aspect of securing transparency and accountability in decision-making; and
 - Contributes toward maintaining a health, vibrant democracy.”

To the above, one can add the following universally recognised principles for public participation:

- Inclusive consultation that enables all sectors of society to participate in the consultation and assessment processes;
- Provision of accurate and easily accessible information in a language that is clear and sufficiently non-technical for I&APs to understand, and that is sufficient to enable meaningful participation;
- Active empowerment of grassroots people to understand concepts and information with a view to active and meaningful participation;
- Use of a variety of methods for information dissemination in order to improve accessibility, for example, by way of discussion documents, meetings, workshops, focus group discussions, and the printed and broadcast media;
- Affording I&APs sufficient time to study material, to exchange information, and to make contributions at various stages during the assessment process;
- Provision of opportunities for I&APs to provide their inputs via a range of methods, for example, via briefing sessions, public meetings, written submissions or direct contact with members of the EIA team.
- Public participation is a process and vehicle to provide sufficient and accessible information to I&APs in an objective manner to assist I&APs to identify issues of concern, to identify alternatives, to suggest opportunities to reduce potentially negative or enhance potentially positive impacts, and to verify that issues and/or inputs have been captured and addressed during the assessment process.

At the outset it is important to highlight two key aspects of public participation:

- There are practical and financial limitations to the involvement of all individuals within a PPP. Hence, public participation aims to generate issues that are representative of societal sectors, not each individual. Hence, the PPP will be designed to be inclusive of a broad range of sectors relevant to the proposed project.

- The PPP will aim to raise a diversity of perspectives and will not be designed to force consensus amongst I&APs. Indeed, diversity of opinion rather than consensus building is likely to enrich ultimate decision-making. Therefore, where possible, the PPP will aim to obtain an indication of trade-offs that all stakeholders (i.e. I&APs, technical specialists, the authorities and the development proponent) are willing to accept with regard to the ecological sustainability, social equity and economic growth associated with the project.

4.4 Objectives of the Scoping Process

This Scoping Process is being planned and conducted in a manner that is intended to identify and provide sufficient information to enable the authorities to reach a decision regarding the scope of issues to be addressed in this EIA Process, and in particular to convey the range of specialist studies that will be included as part of the Environmental Impact Reporting Phase of the EIA, as well as the approach to these specialist studies.

As highlighted in Chapter 1 of this Scoping Report, within this context, the objectives of this Scoping Process (as per the 2014 EIA Regulations) are to:

- Identify and inform a broad range of stakeholders about the proposed development;
- Confirm the process to be followed and opportunities for stakeholder engagement;
- Clarify the project scope to be covered;
- Identify and confirm the preferred activity and technology alternative;
- Identify and confirm the preferred site for the preferred activity;
- Clarify the alternatives being considered and ensure due consideration of alternative options regarding the proposed development, including the “No-go” option;
- Conduct an open, participatory and transparent approach and facilitate the inclusion of stakeholder issues in the decision-making process;
- Identify and document the key issues to be addressed in the impact assessment phase (through a process of broad-based consultation with stakeholders) and the approach to be followed in addressing these issues; and
- Confirm the level of assessment to be undertaken during the impact assessment

4.5 Tasks in the Scoping Phase

This section provides an overview of the tasks being undertaken in the Scoping Phase, with a particular emphasis on providing a clear record of the PPP followed. As discussed in Chapter 1 of this Scoping Report, three Solar PV projects are being proposed by the Applicant which requires a Scoping and EIA Process. These projects are referred to as Kenhardt PV 1, Kenhardt PV 2, and Kenhardt PV 3. Separate BA Processes will be undertaken for the construction of the proposed transmission lines to and associated electrical infrastructure at the Eskom Nieuwehoop Substation. These separate BA projects are referred to as Kenhardt PV 1 - Transmission Line, Kenhardt PV 2 - Transmission Line, and Kenhardt PV 3 - Transmission Line.

Even though three separate Applications for EA were submitted to the DEA for the Scoping and EIA Projects (i.e. Kenhardt PV 1, Kenhardt PV 2, and Kenhardt PV 3) and three separate Applications for EA will be submitted to the DEA during the EIA Phase for the BA projects, and three separate Scoping, BA and EIA Reports will be compiled for each project, the PPP will be integrated. Integrated PPP for the proposed projects will entail that all public participation documents (such as newspaper advertisements, site notices, notification letters etc.) will serve to notify the public and organs of state of the joint availability of all reports for the abovementioned projects and will provide I&APs with an opportunity to comment on the reports. This process is outlined in Figure 4.1. This approach is proposed due to the close proximity of the sites (i.e. the proposed projects will take place within the same geographical area) and that proposed project will entail the same activity (i.e. generation of electricity with the use of solar PV panels).

TASK 1: I&AP IDENTIFICATION, REGISTRATION AND THE CREATION OF AN ELECTRONIC DATABASE

Prior to advertising the EA Process in the local print media an initial database of I&APs (including key stakeholders and organs of state) was developed for the Scoping Process. This was supplemented with input from the EIA Project Managers, CSIR, and the Project Applicant, Scatec Solar. A total of 54 I&APs were included on the project database in this manner. Appendix C of this Scoping Report contains the current I&AP database, which has been updated to include requests to register interest in the project, and comments received. At the time of compiling this Scoping Report, the database stands at 62 I&APs, who will be informed about the availability of the Scoping Reports for comment.

While I&APs have been encouraged to register their interest in the project from the start of the process, following the public announcements (refer to Task 2), the identification and registration of I&APs will be ongoing for the duration of the study. Stakeholders from a variety of sectors, geographical locations and/or interest groups can be expected to show an interest in the proposed project, for example:

- Provincial and Local Government Departments;
- Local interest groups, for example, Councillors and Rate Payers associations;
- Surrounding landowners;
- Farmer Organisations;
- Environmental Groups and NGOs; and
- Grassroots communities and structures.

In terms of the electronic database, I&AP details are being captured and automatically updated as and when information is distributed to or received from I&APs. This ongoing record of communication is an important component of the PPP. It must be noted that while not required by the regulations, those I&APs proactively identified at the outset of the Scoping Process will remain on the project database throughout the EIA Process and will be kept informed of all opportunities to comment and will only be removed from the database by request.

TASK 2: ANNOUNCEMENT OF THE SCOPING PROCESS

In order to notify and inform the public of the proposed project and invite I&APs to register on the project database, the project and EIA Process was advertised in one local newspaper (i.e. The Gemsbok), as shown in Table 4.2 below. A copy of the advertisement placed is contained in Appendix D of this report. The newspaper advertisement also provided the details of the project website (i.e. <http://www.csir.co.za/eia/ScatecSolarPV/>), where information available on the project, could be downloaded from.

Table 4.2: Newspaper Advertisements Placed for the Commencement of the BA, Scoping and EIA Processes (Kenhardt PV 1, Kenhardt PV 2, Kenhardt PV 3, Kenhardt PV 1 - Transmission Line, Kenhardt PV 2 - Transmission Line and Kenhardt PV 3 - Transmission Line)

Newspaper	Area of distribution	Language	Date Placed
The Gemsbok	Distribution in Upington, Aggenys, Alexanderbaai, Augrabies, Boesmanland, Brandvlei, Calvinia, Garies, Groblershoop, Grootdrink, Kakamas, Kamieskroon, Kanoneiland, Kathu, Keimoes, Kenhardt, Kuruman, Lambersdrift, Leerkrans, Marydale, Nababeep, Okiep, Olifantshoek, Pofadder, Port Nolloth, Postmasburg, Prieska, Sishen and Springbok.	English	29 July 2015

The Gemsbok is a weekly newspaper and is distributed on Wednesdays and dated for the Fridays. The Gemsbok is therefore distributed from Wednesday onwards and was released on 29 July 2015 for the proposed projects.

In addition to the newspaper advertisement, letters regarding the Scoping and EIA Processes were mailed to all pre-identified key stakeholders on the database, which at the time consisted of 54 I&APs (Letter 1). This letter, dated 30 July 2015, provided I&APs with a 30-day period to register their interest on the project database. The registration period concluded on 31 August 2015. Appendix E of this report contains copies of correspondence and information distributed to I&APs prior to the release of this Scoping Report. Letter 1 to I&APs included the BID developed for the project as well as a Comment and Registration Form. The purpose of the BID was to inform the public of the proposed projects, provide information on the project description, the EIA Processes and to provide an overview of the opportunities and mechanisms for public participation. The letter was sent to all I&APs and organs of state (where postal and physical addresses are available) on the pre-identified database via registered mail. Appendix E of this Scoping Report contains copies of registered mailing receipts (as proof of correspondence).

Letter 1 to I&APs, the BID and Comment and Registration Form were also emailed to all I&APs and organs of state (where email addresses are available) on the pre-identified database on 29 July 2015. A copy of this email and delivery thereof is included in Appendix E of this Scoping Report.

Regulation 41 (2) (a) of the 2014 EIA Regulations require that a notice board providing information on the project and EIA Process is fixed at a place that is conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of the site where the application will be undertaken or any alternative site. To this end, an 841 mm x 594 mm notice board was placed at the locations shown in Table 4.3 on 3 August 2015.

Table 4.3: Site Notice Boards Placed for the Commencement of the BA, Scoping and EIA Processes (Kenhardt PV 1, Kenhardt PV 2, Kenhardt PV 3, Kenhardt PV 1 - Transmission Line, Kenhardt PV 2 - Transmission Line and Kenhardt PV 3 - Transmission Line)

Location	Co-ordinates	Language
Entrance to the Transnet Service Road, which serves as one of the access routes to the (preferred and alternative) project sites.	29° 19' 47.79" S and 21° 9' 15.53" E	Afrikaans
Entrance to the alternative access road (unnamed farm road), which serves as one of the access routes to the (preferred and alternative) project sites.	29° 16' 21.13" S and 21° 19' 15.17" E	English
Kenhardt Petrol Station	29° 20' 52.23" S and 21° 9' 7.97" E	Afrikaans
Kai !Garib Municipality Offices in Kenhardt	29° 20' 56.01" S and 21° 9' 7.69" E	English

Therefore, four notice boards were placed for the proposed projects. A copy of the notice boards and proof of placement thereof is included in Appendix F of this Scoping Report.

TASK 3: ONGOING COMMUNICATION AND CAPACITY BUILDING

The process for this Scoping and EIA aims to ensure that people are involved from the outset, that we proactively solicit the involvement of stakeholders representing all three dimensions of sustainability (i.e. biophysical, social and economic dimensions), and that we provide them with sufficient and accessible information to contribute meaningfully to the process. In this manner, the PPP aims to build the capacity of stakeholders to participate.

Within the context of the EIA Process, capacity building is not viewed as a “once off” event, but rather a series of events and/or information sharing which provides information on a continuous basis thereby building the capacity and knowledge of I&APs to effectively participate in the EIA Process and raise issues of concern.

One of the challenges facing the PPP is the diversity of South African society. Public participation by its very nature is a dynamic process with various sectors of society having varying needs, values and interests. The core question for public participation is “*How can I, the interested and affected party, meaningfully participate in the process?*” This varies according to the needs of I&APs. The

PPP should be inclusive of all I&APs, and afford them the opportunity to raise their issues and concerns in a manner that suits them. Coupled with this South African society is characterized by varying socio-economic, literacy and language levels all of which need to be considered in the participation process. For example, certain I&APs may want to receive documentation only and not attend meetings, some I&APs may want to only attend meetings, other I&APs may not want to attend meetings and send their comments in writing, and some I&APs may want to be actively involved throughout the process.

In order to accommodate the varying needs of I&APs and develop their capacity to participate in the process, information sharing forms an integral and ongoing component of the EIA Process to ensure effective public participation. The following provides an overview of how information sharing is being effected throughout the EIA Process in order to develop the capacity of I&APs to effectively engage in the PPP:

- **Website** - placing EIA related project information on the project website (i.e. <http://www.csir.co.za/eia/ScatecSolarPV/>);
- **Language** - encouraging I&APs to use the language of their choice at meetings or during telephonic discussions and providing translations at meetings in Afrikaans, when required;
- **BID (July 2015)** - which contains information on the proposed projects, the EIA Process and PPP;
- **Newspaper Advertisements** - requesting I&APs to register their interest in the project, raise issues of concern or notifying I&APs of potential public meetings (if required to be held);
- **Letters to I&APs** - notifying them of the various stages of the EIA Process, availability of reports for comment and inviting them to attend potential public meetings (if required to be held). These letters will be sent via registered mail and email (where postal, physical and email addresses are available for I&APs and organs of state on the project database);
- **Report Distribution** - providing hard copies of the Scoping, BA and EIA Reports at local libraries (such as the Kenhardt and Groblershoop libraries) for I&APs to access for viewing. Electronic copies of the reports will also be loaded onto the project website for access. Key organs of state will be provided with hard copies and/or electronic copies of the reports;
- **Public Meeting** - is not proposed during the Scoping and EIA Phase, however a meeting could possibly be held during the review of the BA and EIA Report if warranted and if there is substantial public interest during the EIA Phase. Furthermore, telephonic consultations with key I&APs will take place, upon request; and
- **Focus Group Meetings** - may be undertaken (depending on the interest in the projects) with key I&AP groups (Councillors, ratepayers association, surrounding landowners, affected organs of state, environmental organisations).

Documents will continuously being posted onto the project website (i.e. <http://www.csir.co.za/eia/ScatecSolarPV/>) as and when they become available and I&APs will be notified accordingly.

TASK 4: CONSULTATION WITH AUTHORITIES

All public participation documentation will reach the DEA, as well as other relevant authorities and organs of state included on the I&AP database. Additionally, consultation with relevant authorities on a one-on-one basis will be effected where necessary and notes from these meetings will be compiled summarising the main outcomes thereof.

Comments received on the Scoping Process from the authorities will be included in the Issues and Response Trail as an appendix to the Scoping Report (which will be submitted to the DEA for decision-making in line with Regulation 22 of the 2014 EIA Regulations).

TASK 5: TECHNICAL SCOPING WITH PROJECT PROPONENT AND EIA TEAM

The Scoping Process has been designed to incorporate two complementary components: a stakeholder engagement process that includes the relevant authorities and wider I&APs; and a technical process involving the EIA team and the project proponent (Scatec Solar).

The purpose of the technical Scoping Process is to draw on the past experience of the EIA team and the project proponent to identify environmental issues and concerns related to the proposed project, and confirm that the necessary specialist studies have been identified. The specialist team has worked with the CSIR on several other projects, as well as having experience from EIAs for other renewable energy projects in the Northern Cape. The specialists were therefore able to identify issues (as shown in Chapter 6 of this Scoping Report) to be addressed in the EIA based on their experience and knowledge of the area and type of activity. Their inputs have informed the scope and Terms of Reference for the specialist studies (as included in Chapter 8 of this Scoping Report). The findings of the Scoping Process with the public and the authorities will inform the specialist studies, which will only be completed after the public Scoping Process has been finalised.

TASK 6: CONSULTATION WITH WIDER I&APS (PUBLIC) TO IDENTIFY ISSUES AND CONCERNS

As noted above, in order to accommodate the varying needs of I&APs as well as capture their views and issues regarding the project, a comment and registration period extending from 30 July 2015 to 31 August 2015 was provided during the Project Initiation Phase. The comments received from I&APs, via fax or email have been captured in the Issues and Responses Trail contained in Chapter 7 of this Scoping Report. The Issues and Responses Trail includes comments received from affected authorities in response to the first notification distributed on the project. Appendix G of this Scoping Report contains copies of all the comments received.

The Issues and Responses Trail (Chapter 7) also includes responses from the EIA team (and, in some cases, the project proponent) to the issues raised. In general, the responses indicate how the issues will be addressed in the EIA Process. In some cases, immediate responses and clarification were provided. Where issues were raised that the EIA team considers beyond the scope and purpose of this EIA Process, clear reasoning for this view is provided.

The Scoping Process is currently at this stage, when I&APs are invited to review the Scoping Report. This stage and the forthcoming steps in the Scoping Process are presented below.

As noted above, various opportunities have been provided for I&APs to have their issues noted prior to the release of the Scoping Report. These include:

- Letter 1 to I&APs (dated 30 July 2015) notifying them of the initiation of the Scoping Process and providing them with a BID and a Comment and Registration Form;
- Newspaper advertisement placed;
- Site notice board;
- Website information; and
- Written, faxed or email correspondence.

TASK 7: REVIEW OF THE SCOPING REPORT (CURRENT STAGE)

This stage in the process entails the release of the Scoping Report for a 30-day period for public review (in line with Regulation 3 (8) and Regulation 21 (1) of the 2014 EIA Regulations). All I&APs on the project database will be notified in writing of the release of the Scoping Report for review.

The following mechanisms and opportunities will be utilised to notify I&APs of the release of the Scoping Report for comment:

- **Correspondence to I&APs** - Letter to notify I&APs of the release of the Scoping Reports and the comment period will be sent via registered mail and email (where postal, physical and email addresses are available for I&APs and organs of state on the project database). The letter will include an Executive Summary of the Scoping Reports and a Comment and Registration Form;
- **Availability of Information** - the Scoping Reports will be made available for review by I&APs and key authorities through the following means:
 - The Scoping Reports will be placed on the project website (i.e. <http://www.csir.co.za/eia/ScatecSolarPV/>);
 - The Scoping Reports will be placed at the Kenhardt and Groblershoop libraries;
 - Key authorities will be provided with either a hard copy and/or CD of the Scoping Reports.
 - Telephonic consultations will be held with key I&AP and organs of state groups, as necessary.

All issues identified through the review of the Scoping Report will be captured in an updated Issues and Responses Trail (as an appendix to the Scoping Report), which will be submitted to the DEA for decision-making in line with Regulation 22 of the 2014 EIA Regulations.

TASK 8: SUBMISSION OF SCOPING REPORTS TO THE DEA FOR DECISION-MAKING

Following the commenting period of the Scoping Reports and incorporation of the comments received into the reports, the Scoping Reports will be submitted to the DEA for decision-making in line with Regulation 22 of the 2014 EIA Regulations. In line with best practice, I&APs on the project database will be notified of the submission of the Scoping Reports to the DEA for decision-making.

The Scoping Reports that are submitted for decision-making will also include proof of the PPP that was undertaken to inform organs of state and I&APs of the availability of the Scoping Reports for the 30 day review (during Task 7, as explained above). To ensure ongoing access to information, copies of the Scoping Reports that are submitted for decision-making will be placed on the project website (i.e. <http://www.csir.co.za/eia/ScatecSolarPV/>).

The DEA will have 43 days (from receipt of the Scoping Reports) to either accept the Scoping Reports with or without conditions, or refuse EA.

This step marks the end of the PPP for the Scoping Phase. The PPP for the subsequent EIA Phase is presented in the Plan of Study for EIA (Chapter 8).

4.6 Schedule for the EIA

The proposed schedule for the EIA, based on the legislated EIA Process, is presented in Table 4.4. It should be noted that this schedule could be revised during the EIA Process, depending on factors such as the time required for decisions from authorities.

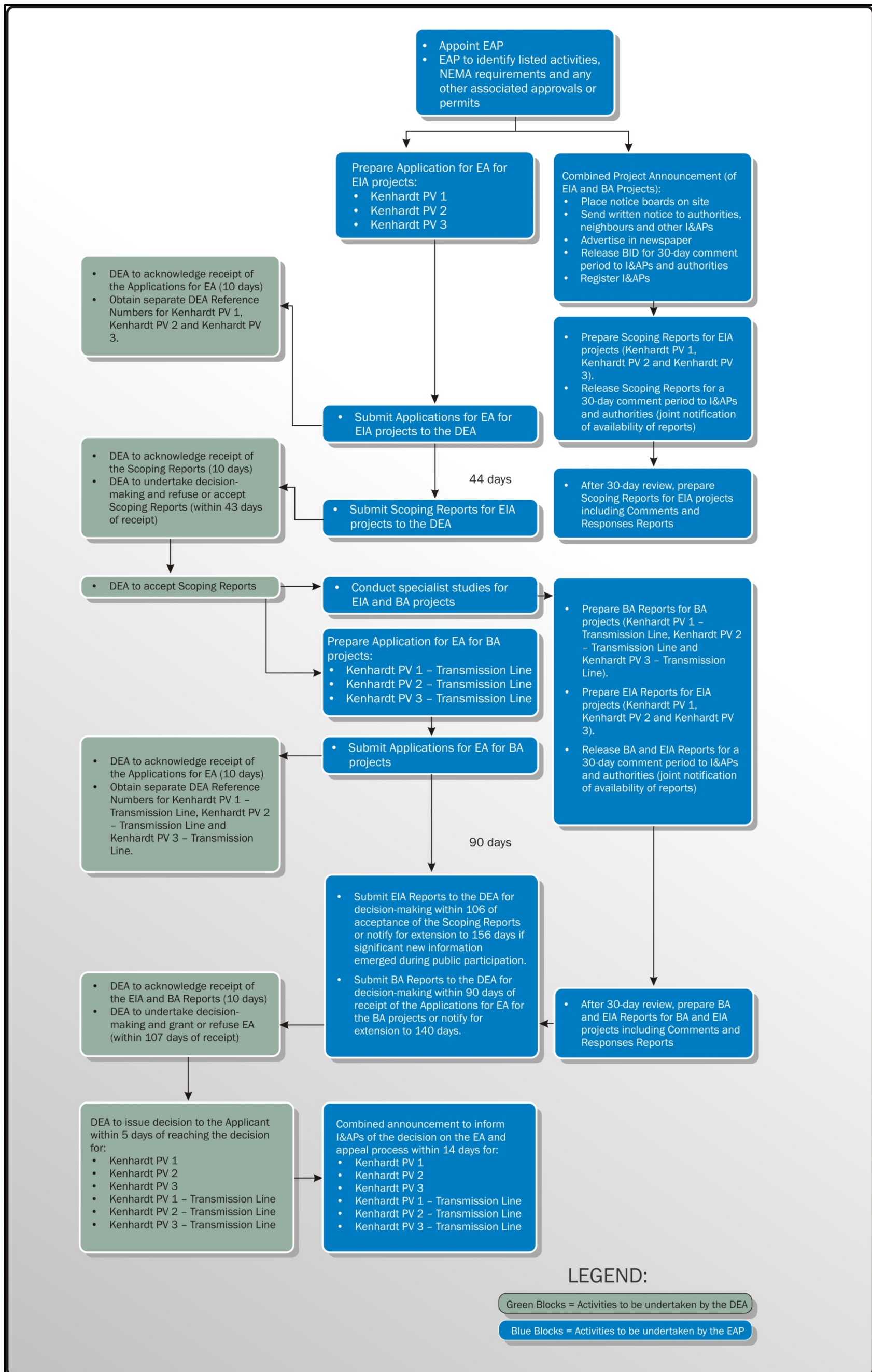


Figure 4.1: Joint PPP proposed for the Kenhardt PV EIA and BA Projects

SCOPING REPORT



CHAPTER 5: Project Alternatives

Scoping and Environmental Impact Assessment for the Proposed Development of a 75 MW Solar Photovoltaic Facility (KENHARDT PV 1) on the remaining extent of Onder Rugzeer Farm 168, north-east of Kenhardt, Northern Cape Province

contents

5	APPROACH TO THE ASSESSMENT OF ALTERNATIVES	5-3
5.1	Assessment of Alternatives	5-3
5.1.1	<i>No-go Alternative</i>	5-3
5.1.2	<i>Land-use Alternatives</i>	5-5
5.1.2.1	Agriculture	5-5
5.1.2.2	Renewable Energy Alternatives	5-5
5.1.3	<i>Site Alternatives</i>	5-11
5.1.3.1	Site Specific Considerations	5-11
5.1.4	<i>Location Alternatives</i>	5-12
5.1.5	<i>Technology Alternatives</i>	5-15
5.1.5.1	Solar Panel Types	5-15
5.1.5.2	Mounting System	5-15
5.1.6	<i>Layout Alternatives</i>	5-15
5.2	Concluding Statement of Preferred Alternatives	5-16

tables

Table 5.1:	Evaluation of Potential Risks and Impacts for Renewable Energy Alternatives	5-10
Table 5.2:	Site selection factors and suitability of the site	5-11

figures

Figure 5.1:	Biomass Potential (Source: SARERD)	5-6
Figure 5.2:	Micro Hydro Power Potential (Source: SARERD)	5-6
Figure 5.3:	Representation of Mean Wind Speed (ms^{-1} at 100 m) (Source: WASA, 2014)	5-7
Figure 5.4:	Solar Resource Availability in South Africa (Source: SolarGIS map© 2013 GeoModel Solar).	5-8
Figure 5.5:	Direct Normal Irradiation of South Africa (Source: SolarGIS map© 2014 GeoModel Solar).	5-8
Figure 5.6:	Renewable Energy Development Areas identified in the Strategic Environmental Assessment (the proposed project falls within the REDZ 7)	5-9
Figure 5.7:	Location Alternatives on the Remaining Extent of Onder Rugzeer 168 that was considered in the Scoping Phase.	5-13
Figure 5.8:	Scatec Solar Kenhardt PV 1, Kenhardt PV 2, and Kenhardt PV 3 projects.	5-14



5 APPROACH TO THE ASSESSMENT OF ALTERNATIVES

This chapter discusses the alternatives that will be considered as part of the EIA Phase. The 2014 EIA Regulations (GN R982) define “alternatives”, in relation to a proposed activity, “as different means of meeting the general purpose and requirements of the activity, which may include alternatives to the:

- property on which or location where the activity is proposed to be undertaken;
- type of activity to be undertaken;
- design or layout of the activity;
- technology to be used in the activity; or
- operational aspects of the activity; and
- includes the option of not implementing the activity”.

Appendix 2 of the 2014 EIA Regulations provides the following objectives of the Scoping Process in relation to alternatives:

- To identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process; and
- To identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment.

The Scoping Report is therefore required to provide a full description of the process followed to reach the proposed preferred activity, site and location within the site, including details of all the alternatives considered and the outcome of the site selection matrix.

Sections 24(4) (b) (i) and 24(4A) of the NEMA require an EIA to include investigation and assessment of impacts associated with alternatives to the proposed project. In addition, Section 24O (1)(b)(iv) also requires that the Competent Authority, when considering an application for EA, takes into account “where appropriate, any feasible and reasonable alternatives to the activity which is the subject of the application and any feasible and reasonable modifications or changes to the activity that may minimise harm to the environment”.

Therefore, the assessment of alternatives should, as a minimum, include the following:

- The consideration of the no-go alternative as a baseline scenario;
- A comparison of the reasonable and feasible alternatives; and
- Providing a methodology for the elimination of an alternative.

5.1 Assessment of Alternatives

5.1.1 No-go Alternative

The no-go alternative assumes that the proposed project will not go ahead i.e. it is the option of not constructing the proposed Kenhardt PV 1 project. This alternative would result in no environmental impacts on the site or surrounding local area. It provides the baseline against which other alternatives are compared and will be considered throughout the report. The following implications will occur if the “no-go” alternative is implemented:

- No benefits will be derived from the implementation of an additional land-use;

- No additional power will be generated or supplied through means of renewable energy resources by this project at this location. The proposed 75 MW facility is predicted to generate approximately 200 GW/h per year which could power 20 000 households;
- The “no go” alternative will not contribute to and assist the government in achieving its proposed renewable energy target of 17 800 MW by 2030;
- Additional power to the local grid will need to be provided via the Eskom grid, with approximately 90% coal-based power generation with associated high levels of CO₂ emissions and water consumption;
- Electricity generation will remain constant (i.e. no additional renewable energy generation will occur on the proposed site) and the local economy will not be diversified;
- Local communities will continue their dependence on agriculture production and government subsidies. The local municipality’s vulnerability to economic downturns will increase because of limited access to capital;
- There will be no opportunity for additional employment in an area where job creation is identified as a key priority. Between 90 and 150 skilled and 400 and 460 unskilled employment opportunities are expected to be created during the construction phase. Approximately 20 skilled and 40 unskilled employment opportunities will be created over the 20 year lifespan of the proposed facility;
- There will be lost opportunity for skills transfer and education/training of local communities;
- The positive socio-economic impacts likely to result from the project such as increased local spending and the creation of local employment opportunities will not be realised; and
- The local economic benefits associated with the REIPPPP will not be realised, and socio-economic contribution payments into the local community trust will not be realised.

Converse to the above, the following benefits could occur if the “no-go” alternative is implemented:

- There will be no development of solar energy facilities at the proposed location;
- Only the agricultural land use will remain;
- No threatened vegetation will be removed or disturbed during the development of these facilities;
- No change to the current landscape will occur;
- No additional transmission lines and additional electrical infrastructure will be constructed; and
- No additional water use during the construction phase and the cleaning of panels during the operational phase.

It is important to take into account that the country is facing serious power and water shortages due to its heavy dependency on fossil fuels such as coal. There is therefore a need for additional electricity generation options to be developed throughout the country. As discussed in Chapter 1 of this Scoping Report, the purpose of the proposed Kenhardt PV 1 project is to feed electricity generated by a renewable energy resource into the national electricity grid. Many other socio-economic and environmental benefits will result from the development of this project such as development of renewable energy resources in the country and contribution to the increase of energy security, employment creation and local economic development (as noted above).

Hence, while the “no-go” alternative will not result in any negative environmental impacts; it will also not result in any positive community development or socio-economic benefits. It will also not assist government in addressing climate change, reaching its set targets for renewable energy, nor will it assist in supplying the increasing electricity demand within the country. Hence the “no-go” alternative is not a preferred alternative.

5.1.2 Land-use Alternatives

5.1.2.1 Agriculture

At present the proposed site is zoned for agricultural land-use, and is mainly used for livestock grazing. As noted in Chapter 3 of this Scoping Report, agricultural potential is uniformly low across the preferred and alternative sites and the choice of placement of the proposed facility on the farm therefore has minimal influence on the significance of agricultural impacts. No agriculturally sensitive areas occur within the site. Hence, agricultural land use is not a preferred alternative. A Soils and Agricultural Potential Assessment will be conducted during the EIA Phase in order to assess the potential impacts of the proposed development on soils and agricultural potential.

5.1.2.2 Renewable Energy Alternatives

Where the “activity” is the generation of electricity, possible reasonable and feasible land-use alternatives for the proposed properties include Biomass, Hydro Energy and Wind Energy. However, based on the preliminary investigations undertaken by the Project Applicant, no other renewable energy technologies are deemed to be appropriate for the site. The unsuitability of other renewable energy developments for the site is discussed below.

▪ Biomass Energy

The proposed project site lacks any abundant or sustainable supply of biomass. According to the South African Renewable Energy Resource Database (SARERD), the project site is identified as having no cumulative biomass energy potential (as shown in Figure 5.1). Certain areas within the KwaZulu-Natal province, for example, have a good biomass energy potential ranging between 101 GJ/ha/year and 500 GJ/ha/year (as shown in Figure 5.1). However, based on the SARERD, the implementation of a Biomass Facility at the proposed site in the Northern Cape is therefore considered to be an unfeasible and unreasonable alternative to the implementation of the proposed solar PV energy facility.

▪ Hydro Energy

The proposed project site lacks any large inland water bodies, which precludes the possibility of renewable energy from small/large scale hydro generation. In terms of micro hydro power potential, the SARERD has classified the proposed project site as “Not Suitable” (as shown in Figure 5.2). The SARERD classifies certain areas within the Western Cape and the Drakensberg as having an excellent micro hydro power potential. However, based on the SARERD, the implementation of a Hydro Energy Facility at the proposed site is therefore also considered to be an unfeasible and unreasonable alternative to the implementation of the proposed solar PV energy facility.

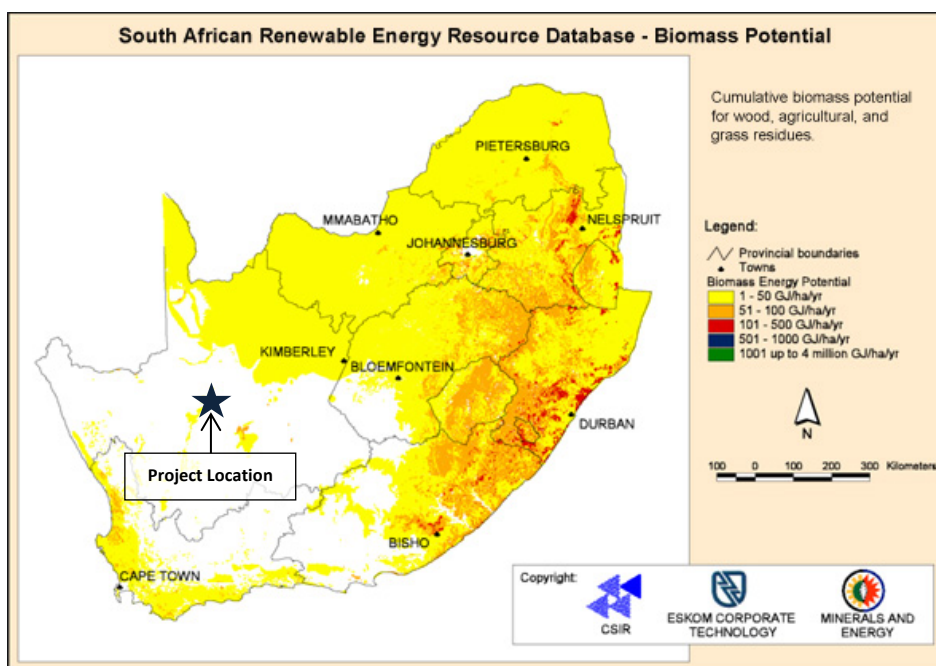


Figure 5.1: Biomass Potential (Source: SARERD)

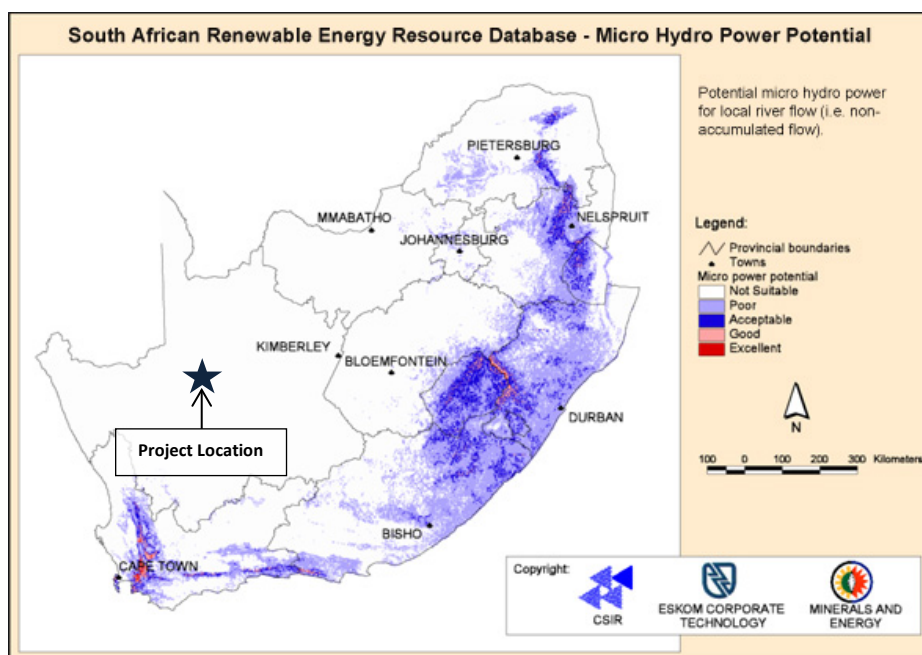


Figure 5.2: Micro Hydro Power Potential (Source: SARERD)

- **Wind Energy**

Wind energy is considered to be the most feasible alternative to solar energy when compared to biomass and hydro energy; however the site specific requirements of wind energy facilities make it a less feasible alternative when compared to solar PV. In order to ensure that a wind energy facility is successful, a reliable wind resource is required. A wind resource is defined in terms of average wind speed, turbulence, and direction. Measurements provided by the Wind Atlas of South Africa (WASA) indicate that the mean wind speed is the highest at the coastal regions of South Africa (as shown in Figure 5.3).

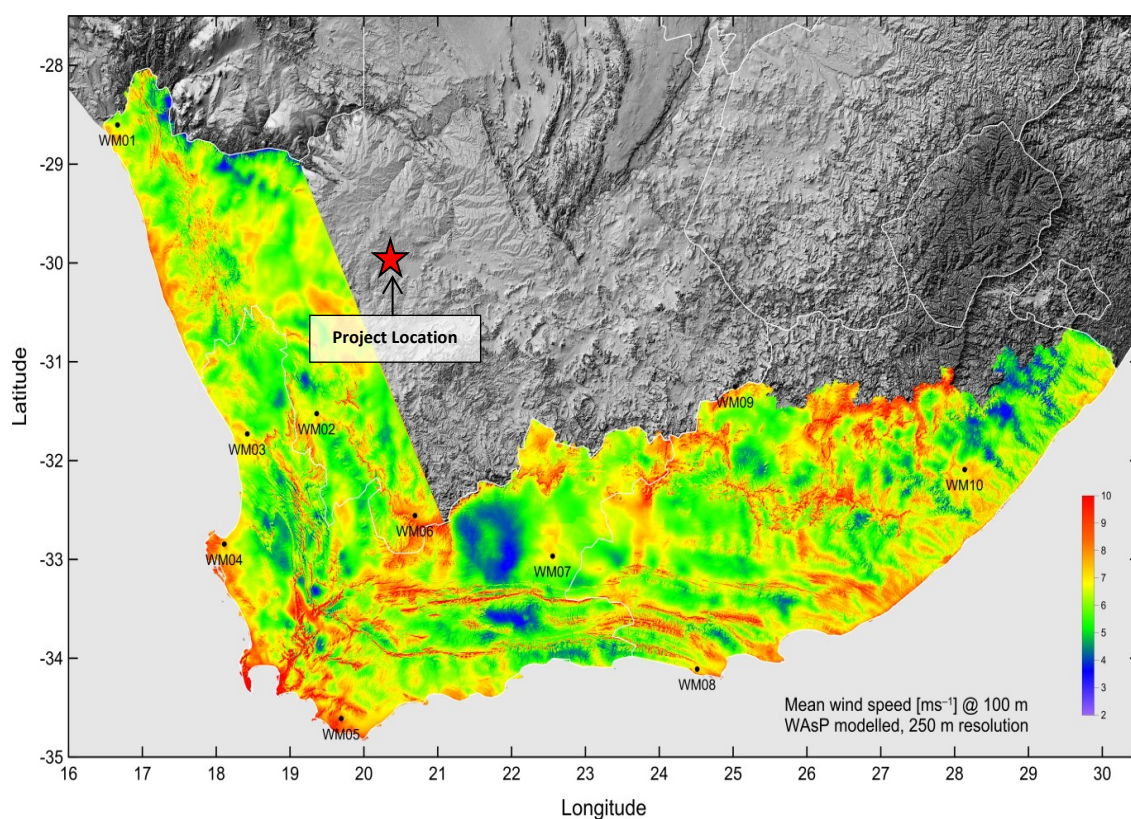


Figure 5.3: Representation of Mean Wind Speed (ms^{-1} at 100 m) (Source: WASA, 2014)

▪ **Solar Energy**

• *National Level Considerations: Solar Radiation*

The north-western part of South Africa has the highest Global Horizontal Irradiation¹ (GHI), relevant to PV installations (Figure 5.4) and Direct Normal Irradiance² (DNI), relevant to CPV and tracking PV installations (Figure 5.5). Therefore, this section of South Africa is deemed the most suitable for the construction and operation of solar energy facilities as opposed to other areas and provinces within South Africa. For example, coastal regions within KwaZulu-Natal, Eastern Cape and Western Cape mainly have a solar radiation between 1500 kWh/m² and 1700 kWh/m² per annum, which is not completely feasible for the proposed projects. On the other hand, the Northern Cape (the area with the predominant pink shading in Figure 5.4) has a solar radiation of 2300 kWh/m² per annum, which is the highest level. Various developers have received several approvals for PV facilities on farms in the Northern Cape, which shows and justifies the suitability of this area for this type of development.

¹ Global Horizontal Irradiance is the total amount of shortwave radiation received from above by a surface horizontal to the ground

² Direct Normal Irradiance is the amount of solar radiation received per unit area by a surface that is always held perpendicular (or normal) to the rays that come in a straight line from the direction of the sun at its current position in the sky.

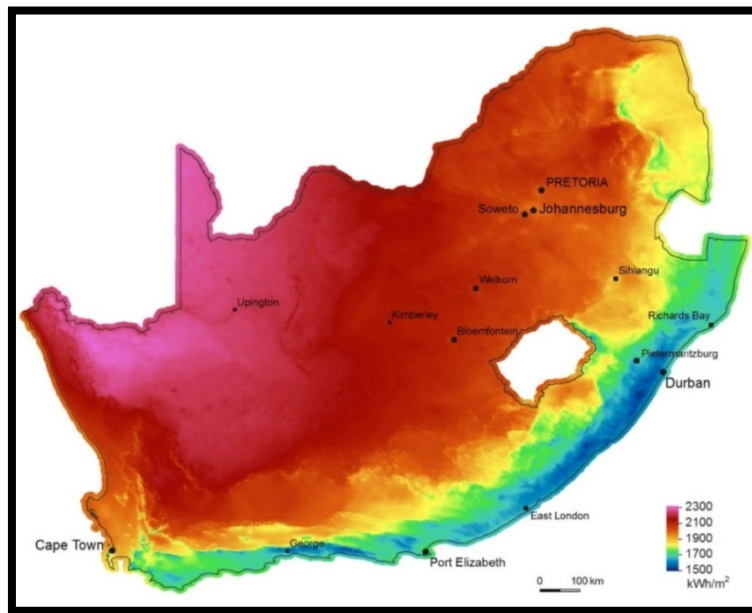


Figure 5.4: Solar Resource Availability in South Africa (Source: SolarGIS map© 2013 GeoModel Solar).

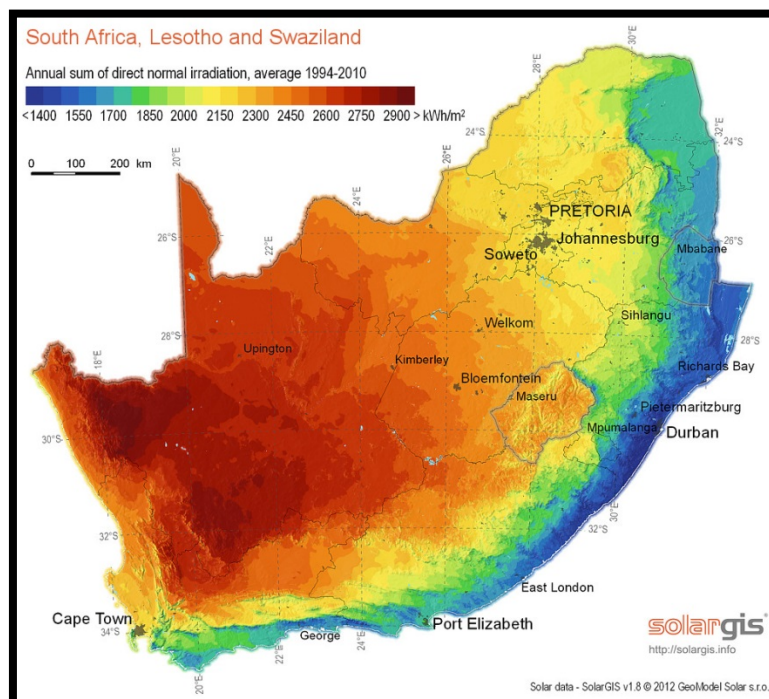


Figure 5.5: Direct Normal Irradiation of South Africa (Source: SolarGIS map© 2014 GeoModel Solar).

- *REIPPPP and SEA for Wind and Solar PV in South Africa*

The Integrated Resource Plan for South Africa for the period 2010 to 2030 (referred to as “IRP2010”) and the IRP Updated Report (2013) proposes to secure 17 800 MW of renewable energy capacity by 2030. The DOE subsequently has entered into a bidding process for the procurement of 3725 MW of renewable energy from IPPs by 2016 and beyond to enable the Department to meet this target. On 18 August 2015, an additional procurement target of 6300 MW to be generated from renewable energy sources was added to the REIPPPP for the years 2021 - 2025, as published in

Government Gazette 39111. The additional target allocated for wind energy, solar PV energy, and solar CSP energy is 3040 MW, 2200 MW, and 600 MW respectively.

In order to submit a bid, the proponent is required to have obtained an EA in terms of the EIA Regulations as well as several additional authorisations or consents. It has been determined that even though the current processes will enable renewable energy to be fed into the national grid, the REIPPPP does have certain inefficiencies. As noted in Chapter 1 of this Scoping Report, to this end, the National DEA, in discussion with the DOE, has been mandated by MinMec to undertake a SEA³ to identify the areas in South Africa that are of strategic importance for Wind and Solar PV development. The Wind and Solar PV SEA is in support of the Strategic Infrastructure Plan (SIP) 8, which focuses on the promotion of green energy in South Africa. The SEA aims to identify strategic geographical areas best suited for the roll-out of large scale wind and solar PV energy projects, referred to as REDZs. Through the identification of the REDZs, the key objective of the SEA is to enable strategic planning for the development of large scale wind and solar PV energy facilities in a manner that avoids or minimises significant negative impact on the environment while being commercially attractive and yielding the highest possible social and economic benefit to the country - for example through strategic investment to lower the cost and reduce timeframes of grid access⁴. Following the completion of the SEA, the proposed REDZs, shown in Figure 5.6, will be submitted for Cabinet approval for the rollout of solar PV energy in the Northern Cape, Eastern Cape, Western Cape and Free State provinces.

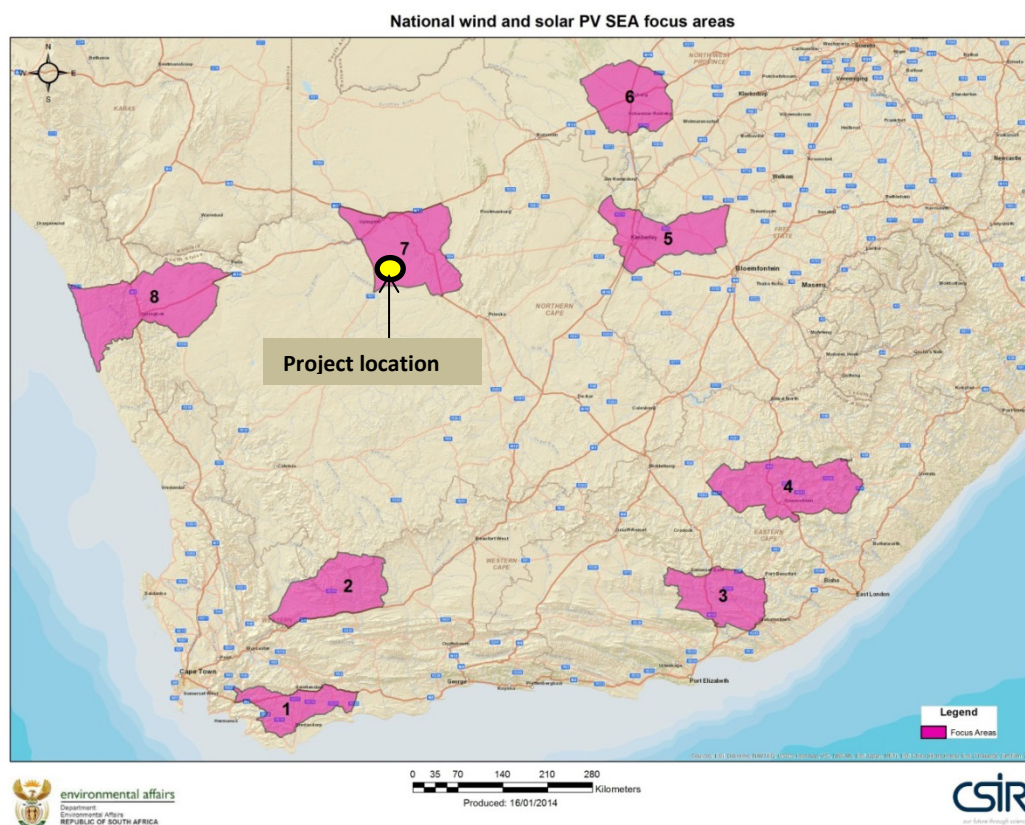


Figure 5.6: Renewable Energy Development Areas identified in the Strategic Environmental Assessment (the proposed project falls within the REDZ 7)

³ Information on this process can be obtained at:
<http://www.csir.co.za/nationalwindsolaresea/background.html>

⁴ More information on the SEA can be read at <https://redzs.csir.co.za/>

As previously noted, the proposed solar facility currently falls within the REDZ 7. The proposed project is therefore in line with the criteria of the SEA and located in an area of strategic importance for Solar PV development. It should be noted that even if a project falls within a REDZ, the proposed development still requires site specific assessments as per the site protocol in order to determine the potential impacts of a project at a local and site specific level.

Therefore, the implementation of a solar energy facility at the proposed project site is more favourable and feasible than other alternative energy facilities. Therefore in terms of project and location compatibility, the proposed solar facility is considered to be the most feasible renewable energy land use alternative. Since these alternative land-uses were deemed unsuitable for the area and the preferred and alternative sites, these technologies will not be further assessed during the EIA Phase. Only solar energy will be assessed during the EIA Phase. Furthermore, it is important to note that solar energy development (i.e. not wind energy, hydro power and biomass) is the Project Applicant's core business area and focus. The experience that the Project Applicant has within the solar energy development industry will positively benefit the proposed project.

Furthermore, from an impact and risk assessment perspective, the implementation of a solar PV project on the remaining extent of Onder Rugzeer Farm 168 will result in fewer risks and low significance impacts in comparison to the implementation of wind energy, hydro power and biomass. The risks and impacts are described in Table 5.1 below.

Table 5.1: Evaluation of Potential Risks and Impacts for Renewable Energy Alternatives

Type of Renewable Energy	Potential Impacts and Risks
Biomass Energy	<ul style="list-style-type: none"> Based on the SARERD, the project site has no cumulative biomass energy potential. Therefore, a biomass facility will be unfeasible at the proposed project site. If a biomass facility was to be constructed instead of a solar facility, it will create significant negative socio-economic implications as it would not be feasible in terms of operations. It will most likely use valuable municipal resources without contributing to the local economy in a beneficial manner. A biomass facility is also likely to result in unnecessary pollution due to waste generation (especially waste water generated during the operational phase of the biomass facility), traffic impacts and air emissions as a result of operations. A biomass facility is likely to create traffic impacts as the material required for the plant (i.e. biomass) would need to be transported to the site on a regular basis during the relevant seasons.
Hydro Energy	<ul style="list-style-type: none"> Based on the SARERD, the project site is not suitable in terms of hydro energy potential. Hydro power is also not noted as a renewable energy source in terms of the municipal IDP. As with biomass, a hydro power facility will be unfeasible and not possible at the proposed project site. If a hydro power was to be constructed instead of a solar facility, it will create significant negative socio-economic implications as it would not be feasible in terms of operations.
Wind Energy	<ul style="list-style-type: none"> Wind energy facilities require that wind turbines are spaced a significant distance from one another. Due to the fact that there is only a certain amount of land available for development, the implementation of a wind energy facility would not make optimum use of that land which is available. The total development area required for the implementation of a wind energy project is much higher than that required with a solar energy facility, resulting in additional potential environmental impacts (such as soil erosion, impacts on nearby watercourses and impact on the geohydrology). A wind facility would generate additional noise during the operational phase as compared to a solar energy facility.
Solar Energy	<ul style="list-style-type: none"> The solar resources available across the proposed project site are better and represent a higher yield than the biomass, hydro or wind resources available across the same site. The proposed solar facility currently falls within the REDZ 7, which is an area of strategic importance for large scale Solar PV development (as discussed above

Type of Renewable Energy	Potential Impacts and Risks
	<p>and in Chapter 1 of this Scoping Report).</p> <ul style="list-style-type: none"> ▪ There is a possibility that the proposed solar energy facility will still provide an opportunity for the current land use (i.e. grazing) to continue during operations. ▪ Additional potential impacts relating to the proposed Kenhardt PV 1 project are noted in Chapter 6 of this Scoping Report.

5.1.3 Site Alternatives

As noted above, as per the requirements listed within Appendix 2 (2) (h) (ix) of the 2014 EIA Regulations, a site selection matrix should be provided to show how the preferred site was determined through a site selection process. Within this context, it is assumed that the “site” referred to in the 2014 EIA Regulations is the farm or land portions on which proposed location alternatives will be considered for the proposed project (discussed in Section 5.1.4 below).

As discussed in Chapter 1 of this Scoping Report, as well as Section 5.1.2 above, the preferred and alternative sites within the Northern Cape were selected based on national level considerations (high solar radiation in the Northern Cape, as opposed to other provinces within South Africa) and the fact that the proposed sites currently fall within the REDZ 7. On a site specific (local) level, the site was deemed suitable due to all the site selection factors (such as land availability, distance to the national grid, site accessibility, topography, fire risk, current land use and landowner willingness) being favourable. The site selection criteria considered by the Applicant are discussed in detail below.

5.1.3.1 Site Specific Considerations

On a local (site specific) level, the site selection process took into account the following factors shown in Table 5.2.

Table 5.2: Site selection factors and suitability of the site

FACTOR	SUITABILITY OF THE preferred SITE
Land Availability	The remaining extent of Onder Rugzeer Farm 168 is of a suitable size for the proposed project. The land available to develop at the preferred site for Kenhardt PV 1 extends approximately 450 ha, however only an estimated 250 ha will be required for the proposed project (i.e. Kenhardt PV 1).
Irradiation Levels	2100 - 2300 kWh/m ² (as shown in Figure 5.4)
Distance to the Grid	<p>An Environmental Authorisation for the construction of the 400/50 50 kV Eskom Nieuwehoop Substation was granted to Eskom Holdings SOC Limited on 21 February 2011 by the DEA (Reference Number: 12/12/20/1166). Site preparation and construction of the substation has commenced and is currently underway. An Environmental Authorisation (DEA Reference Number: 12/12/20/2606; NEAS Reference Number: DEA/EIA/0000785/2011), dated 14 February 2014, was also granted to Eskom Holdings SOC Limited to construct, <i>inter alia</i>, the following within the existing development footprint of the Nieuwehoop Substation:</p> <ul style="list-style-type: none"> - 2 x 400 kV transformer feeder bay; - A 400 / 132 kV transformer; - 132 kV busbar; - 400 / 132 kV 500 MVA x 3 transformers; and - 8 x 132 kV feeder bays and associated lines. <p>The proposed project will be located approximately 3 km from the Eskom Nieuwehoop Substation.</p>
Site Accessibility	The proposed project site can be accessed via an existing gravel road and the existing Transnet Service Road (private). The existing gravel road can be accessed from the R383 Regional Road via the R27 National Road. The R27 extends from

FACTOR	SUITABILITY OF THE preferred SITE
	Keimoes (in the north) to Vredendal in the south. The Transnet Service Road can be accessed from the R27. Internal gravel roads will be constructed as part of the proposed project.
Topography	Slope $\leq 2\%$ (Level to very gentle slope).
Fire Risk	Main vegetation type is Bushman arid grassland, low fire risk.
Current Land Use	Agriculture - Grazing
Landowner Willingness	The landowner has signed consent for the use of the land for the proposed projects. This is considered an important aspect of the proposed project in terms of its viability (i.e. this will limit potential appeals during the decision-making process, as the landowner is willing and supportive of the proposed projects being undertaken on the farm).

Furthermore, from an impact and risk assessment perspective, the implementation of a solar PV project on the remaining extent of Onder Rugzeer Farm 168 will result in fewer risks in comparison to its implementation at alternate sites within the Northern Cape (i.e. regions with similar irradiation levels). The following risks and impacts will be likely in this case:

- There is no guarantee that suitable land will be available for development of a solar PV facility. Site geotechnical conditions, topography, fire potential and ready access to a site might not be suitable, thus resulting in negative environmental implications and reduced financial viability.
- There is no guarantee that the current land use of alternative sites will be flexible in terms of development potential, for example the agricultural potential for alternative sites might be higher and of greater significance.
- There is no guarantee of the willingness of other landowners to allow the implementation of a solar facility on their land and if the landowners strongly object, then the project will not be feasible.
- There is no guarantee that other sites within the Northern Cape will be located close to existing or proposed electrical infrastructure to enable connection to the national grid. The further away a project is from the grid, the higher the potential for significant environmental and economic impacts.

Given the site selection requirements associated with solar energy facilities and the suitability of the land available on the remaining extent of Onder Rugzeer Farm 168, no other site alternatives will be considered in the EIA Phase.

5.1.4 Location Alternatives

Figure 5.7 shows the location alternatives that were initially considered by the Applicant. These sites are suitable in terms of size requirements, i.e. larger than 250 ha which is required for the proposed Kenhardt PV 1 facility and still falls within the boundaries of the remaining extent of Onder Rugzeer Farm 168 which, as discussed above, has been deemed a suitable site for the proposed development. The preferred site (i.e. Kenhardt PV 1) and the alternative site (i.e. Kenhardt PV 1b) are illustrated in Figure 5.7.

As shown in Figure 5.8 and discussed in Chapter 1 of this Scoping Report, the current project proposal is one of three PV projects proposed on site. The proximity of the two site locations (preferred and alternative) for the Kenhardt PV 1 project to the Nieuwehoop Substation (currently being constructed) was the main consideration in terms of technical and economic feasibility of what the preferred site is. Based on the desktop assessment undertaken to identify the sensitivities on site (discussed in Chapter 3 of this Scoping Report), both site localities are expected to be fairly homogenous in terms of environmental features on site and should there be features present within a specific site boundary, it can be avoided by the layout and design of the project (to be determined during the EIA Phase).

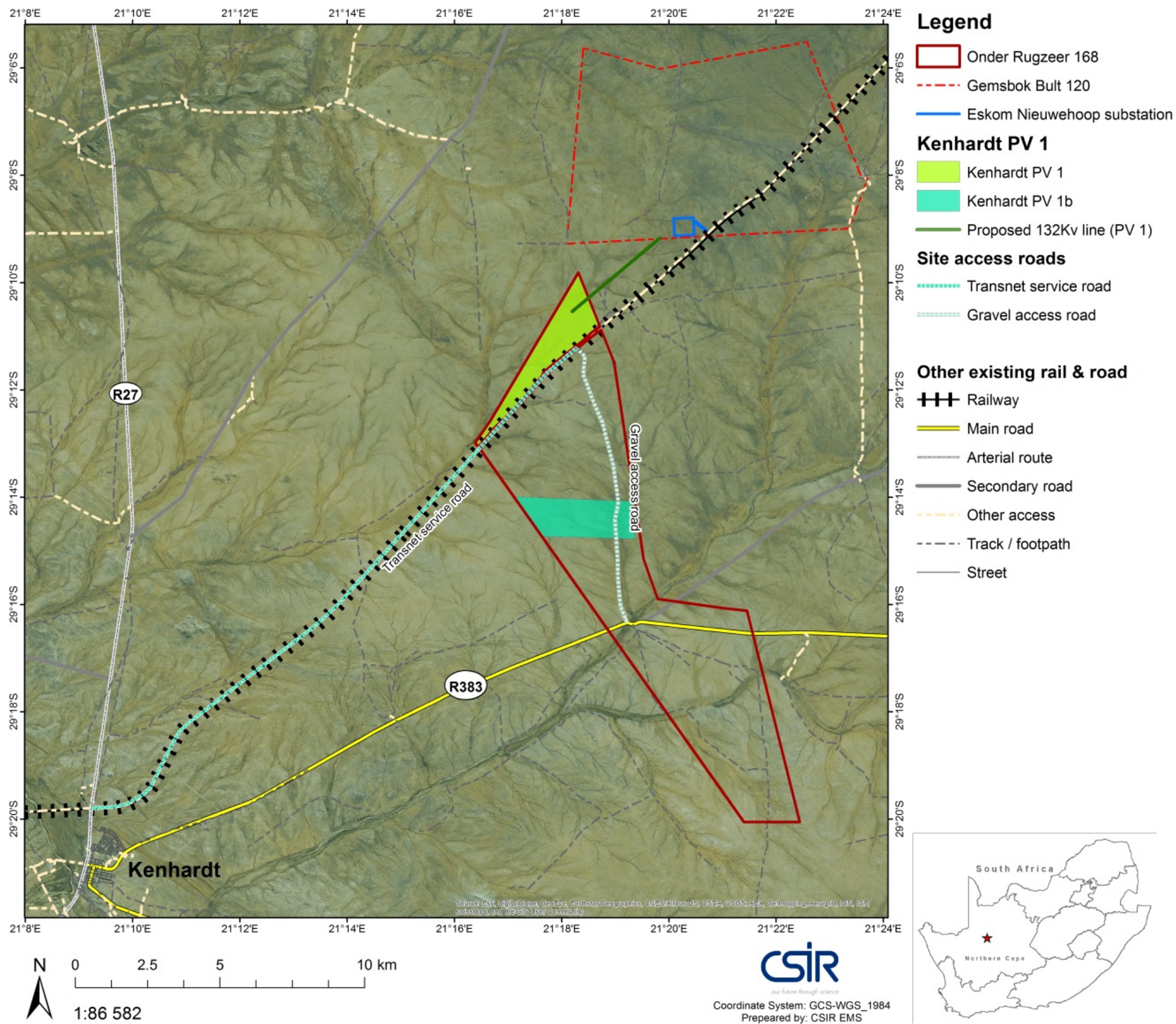


Figure 5.7: Location Alternatives on the Remaining Extent of Onder Rugzeer 168 that was considered in the Scoping Phase.

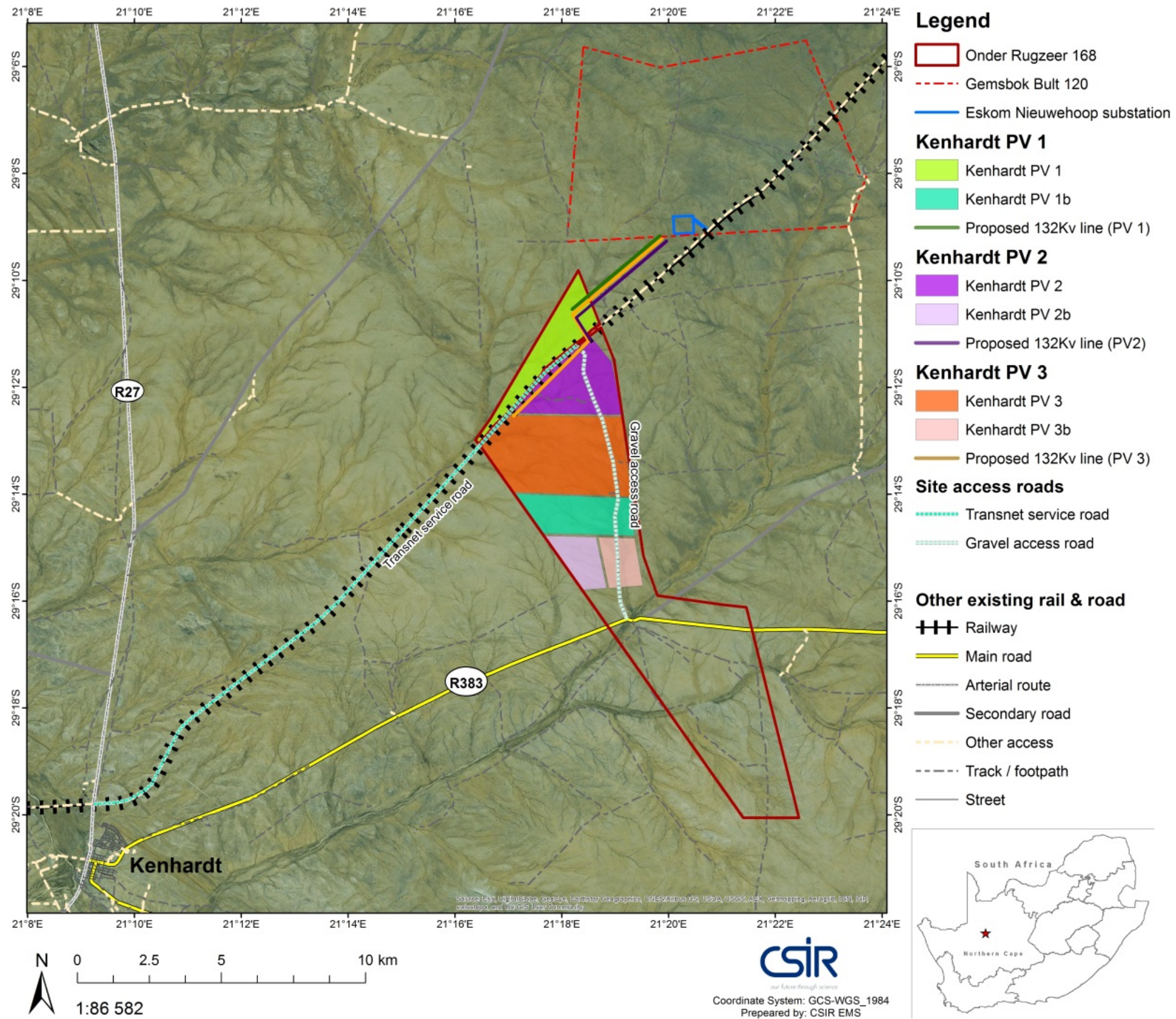


Figure 5.8: Scatec Solar Kenhardt PV 1, Kenhardt PV 2, and Kenhardt PV 3 projects.

Therefore, in relation to the alternative site, the preferred site (i.e. Kenhardt PV 1) is favoured for the proposed project based on the following:

- The alternative Kenhardt PV 1b site is located too far south from the Eskom Nieuwehoop Substation, which therefore significantly reduces the financial viability of the proposed project as additional costs are required for longer transmission lines. Longer power lines may also result in additional environmental impacts. Therefore, the closer the site is to the Eskom Nieuwehoop Substation will reduce potential economic and environmental impacts, and improve the feasibility of the proposed project.
- The alternative site is located closer to the landowner's residence, therefore it would be better to locate the proposed PV facility a greater distance from the farm house (i.e. at the preferred site) to enable a certain level of privacy.
- The alternative site lies closer to the main public road (i.e. R383), resulting in safety concerns, higher visual intrusion on the sense of place and increased risk of theft during the construction and operational phases.

As noted above, the preferred site includes approximately 450 ha of land. The proposed project only requires approximately 250 ha of land; therefore there is scope to avoid major environmental constraints through the final design of the facility. During the EIA Phase, the specialists will identify any sensitive features on the preferred site. As a result, the final siting of the proposed Kenhardt PV 1 facility on the preferred site will be undertaken during the EIA Phase, whereby any sensitive features identified will be avoided by the proposed layout. The final recommended siting of the proposed Kenhardt PV 1 within the preferred site locality will be provided in the EIA Report, together with specialist recommendations.

5.1.5 Technology Alternatives

5.1.5.1 Solar Panel Types

Only the PV solar panel type will be considered in during the EIA Phase. Due to the scarcity of water in the proposed project area and the large volume of water required for CSP, this technology is not deemed feasible or sustainable and will not be considered further. Furthermore, CPV technology therefore requires a larger development footprint to obtain the same energy output as PV technology, and it requires active solar tracking to be effective. Furthermore, as noted above, in Government Gazette 39111 published on 18 August 2015, no additional procurement target was allocated for CPV.

5.1.5.2 Mounting System

Solar panels can be mounted in various ways to ensure maximum exposure of the PV panels to sunlight. The main mounting systems that will be considered as part of the design are:

- Single axis tracking systems;
- Fixed axis tracking systems;
- Dual axis tracking systems; and
- Fixed Tilt Mounting Structure.

The above mounting systems will be considered during the EIA Phase to inform the detailed design of the proposed solar facility. Additional information regarding the mounting system is provided in Chapter 2 of this Scoping Report.

5.1.6 Layout Alternatives

The findings of the specialist studies will be used to inform the layout of the proposed facility within the preferred site, Kenhardt PV 1. The specialist studies that will be conducted during the EIA Phase will identify the various environmental sensitivities present on site that should be

avoided, which will be taken into account during the determination of the proposed layout of the PV facility. These layouts will be assessed during the EIA Phase.

The aim of the EIA Phase (in terms of the layout of the proposed facility), will be to determine a buildable area for the proposed project, which will be assessed by the specialists and considered during the EIA Phase.

5.2 Concluding Statement of Preferred Alternatives

As per Appendix 2, Section 2 (xi) of the 2014 EIA Regulations, and based on Section 5.1 above, the following alternatives will be taken forward into the EIA Phase:

- **No-go Alternative:**
 - The no-go alternative assumes that the proposed project will not go ahead i.e. it is the option of not constructing the proposed Kenhardt PV 1 facility. This alternative would result in no environmental impacts on the site or surrounding local area, as a result of the facility. It will provide a baseline against which other alternatives will be compared and considered during the EIA Phase.
- **Land Use Alternative:**
 - No other renewable energy technologies were deemed to be appropriate for the site and therefore these technologies will not be further assessed during the EIA Phase. The implementation of a solar energy facility at the proposed project site is more favourable than other alternative energy facilities due to the following:
 - The solar resources available across the proposed project site are better and represent a higher yield than the biomass, hydro or wind resources available across the same site;
 - Wind energy facilities require that wind turbines are spaced a significant distance from one another. The implementation of a wind energy facility would not make optimum use of the land which is available; and
 - The proposed solar facility currently falls within the REDZ 7 which has been identified by the DEA SEA as being of strategic importance for Solar PV development (as discussed in Chapter 1 and Chapter 2 of this Scoping Report).
- **Preferred Site and Site Location:**
 - The preferred site for the project is the Remaining Extent of the Onder Rugzeer Farm 168 and the Kenhardt PV 1 site; and
 - The available development areas of each of the above locations exceed 250 ha, which is the approximate area required for each solar PV project.
- **Technology Alternatives:**
 - Applicable and relevant technology options will be described during the EIA Phase, such as those relating to the mounting system.
- **Layout Alternatives:**
 - Layout alternatives for the project will be determined following the input from the various specialists. The studies will aim to identify various environmental sensitivities present on the preferred sites that should be avoided, which will be taken into account during the determination of the proposed layout of the PV facility.
 - The use of the existing Transnet Service Road or the unnamed farm road will also be discussed during the EIA Phase.

SCOPING REPORT



CHAPTER 6: Issues and Potential Impacts

Scoping and Environmental Impact Assessment for the Proposed Development of a 75 MW Solar Photovoltaic Facility (KENHARDT PV 1) on the remaining extent of Onder Rugzeer Farm 168, north-east of Kenhardt, Northern Cape Province

contents

6	ISSUES AND POTENTIAL IMPACTS	6-3
6.1	Ecology (Terrestrial Ecology, Aquatic Ecology and Avifauna)	6-3
	6.1.1 Key Issues	6-3
	6.1.2 Assessment to be undertaken during the EIA Phase	6-4
6.2	Visual Impacts	6-5
	6.2.1 Key Issues	6-5
	6.2.2 Assessment to be undertaken during the EIA Phase	6-6
6.3	Archaeology (including Cultural Landscape)	6-6
	6.3.1 Key Issues	6-6
	6.3.2 Assessment to be undertaken during the EIA Phase	6-6
6.4	Palaeontology	6-6
	6.4.1 Key Issues	6-6
	6.4.2 Assessment to be undertaken during the EIA Phase	6-7
6.5	Geohydrology and Water Use	6-7
	6.5.1 Key Issues	6-7
	6.5.2 Assessment to be undertaken during the EIA Phase	6-8
6.6	Soils and Agricultural Potential	6-8
	6.6.1 Key Issues	6-8
	6.6.2 Assessment to be undertaken during the EIA Phase	6-9
6.7	Social Issues	6-9
	6.7.1 Key Issues	6-9
	6.7.2 Assessment to be undertaken during the EIA	6-9
6.8	Air Quality and Dust	6-9
	6.8.1 Assessment to be undertaken during the EIA Phase	6-10
6.9	Waste Generation	6-10
	6.9.1 Assessment to be undertaken during the EIA Phase	6-10
6.10	Noise Emissions	6-11
	6.10.1 Assessment to be undertaken during the EIA Phase	6-11
6.11	Traffic Generation	6-11
	6.11.1 Assessment to be undertaken during the EIA Phase	6-11
6.12	Proximity to the SKA Project	6-12
	6.12.1 Assessment to be undertaken during the EIA Phase	6-12
6.13	Cumulative Impacts	6-12

tables

Table 6.1: EIA Processes currently underway within 20 km of the proposed project

6-13



6 ISSUES AND POTENTIAL IMPACTS

The purpose of this chapter is to present a synthesis of the key issues and potential impacts that have been identified thus far as part of the Scoping Process. These issues and impacts have been identified via the environmental status quo of the receiving environment (environmental, social and heritage features present on site) (discussed in Chapter 3 of this Scoping Report), a review of environmental impacts from other similar solar projects and input from specialists that form part of the project team. The Terms of Reference for the specialist studies that have been deemed necessary, based on the relevant issues and impacts discussed within this chapter, are incorporated into the Plan of Study for the EIA (discussed in Chapter 8 of this Scoping Report).

6.1 Ecology (Terrestrial Ecology, Aquatic Ecology and Avifauna)

6.1.1 Key Issues

The proposed development will result in a number of actions that will arise in both the construction and operation phases of the project and include inter alia:

- Possible levelling of topographic features;
- Some clearance of vegetation;
- Establishment of hardpanned roadways and related surfaces;
- Excavation and construction of structures using wet trades;
- Cabling at a sub-surface level;
- Establishment of transformers and substations;
- Establishment of PV module arrays, possibly on tracking mountings;
- Fencing of the site;
- Establishment of towers for powerlines/transmission lines (to be assessed as part of the BA Processes); and
- Other supportive infrastructure.

The construction phase is a relatively short term undertaking, although “intensive” in terms of the rapid physical changes that arise on site. The operational phase is more benign in nature, with limited staff and minor activity in and around the proposed PV facility. Given this situation, it is expected that the following impacts of an ecological nature may arise during the construction and operational phases.

▪ Construction Phase

Terrestrial Impacts:

- Ousting of fauna through increased anthropogenic activities, disturbance of refugia (location of an isolated population that was widespread in the past) and general change in habitat.
- Increased electrical light pollution leading to changes in nocturnal behavioural patterns amongst fauna.
- Exclusion (or entrapment) of in particular, larger fauna on account of the fencing of the site.
- Changes in edaphics (soils) on account of excavation and import of material, leading to alteration of plant communities and fossorial species in and around these points.

Aquatic Impacts:

- Alteration in surface drainage patterns on account of construction activities leading to rapid change in plant communities and general habitat structure both within the site and immediately adjacent to site.
- Alteration of surface water quality on account of construction activities that lead to changes in water chemistry (e.g. use of concrete, increased hydrocarbon input, increased sediment within run off etc. alter various chemical parameters).

- Depending upon the origin of water (import or through abstraction of groundwater) changes in sub-surface water resources may arise, particularly in the case of the latter.
- **Operational Phase**

Terrestrial Impacts:

- Alteration of ecological processes on account of the exclusion of certain species inherent to the functional state of land within the PV facility i.e. larger fossorial species and predators will be excluded from the PV facility site by virtue of its fencing, generally leading to possible variations in populations of other species that remain within the site, with concomitant ecological change.
- Increased shading of vegetation as a consequence of the PV arrays, will lead to changes in plant water relations and possible changes in plant community structures within the site.
- Changes in meteorological factors at a localised scale on account of the PV facility is likely to arise (e.g. subtle changes in wind dynamics, “heat bubbles”, as well as alteration in run off of surface water and evapo-transpiration states), leading to long term, but generally latent changes in habitat.
- The fencing of the site, possibly with electric fencing, is likely to impact upon faunal behaviour, leading to the exclusion of certain species and possible mortalities. Alternatively, such changes may also favour some specific individuals, particularly those that remain within the confines of the proposed PV facility, which is likely to lead to further localised alteration in habitat and ecological processes within the facility.

Aquatic Impacts:

- Abstraction of ground water for the cleaning of modules will alter the state of sub-surface water resources, depending upon nature and origin of such water.
- Overhead transmission lines, as well as subtle changes in habitat are likely to result in the alteration of avian behaviour in and around the site (which will be assessed as part of the BA Processes).

Identified Mitigation Measures to be considered as part the EIA Phase:

- Should any of the Quiver Tree (*Aloe dichotoma*) individuals or other protected species be damaged, cut or removed off-site, a permit would first need to be obtained from the DAFF, Upington office.
- The development footprint should be rehabilitated and returned to an ecological functional state if the site needs to be decommissioned. Recommendations for rehabilitation must be provided in the EMP, as applicable.
- The project design and layout need to take cognisance of a number of rivers (including alluvial fans and water courses) and potential wetland areas that may occur on or are associated with the proposed project. These would be vulnerable to impact as a result, primarily, of changes in flow associated with the hardening of large areas of land.
- It is critical that the site layout accommodates the need for effective setbacks of the development and its infrastructure from the aquatic habitats.
- Management of flows into any wetlands or drainage lines should be such that the development, regardless of extent of setback, does not result in any impacts to sensitive aquatic systems.

6.1.2 Assessment to be undertaken during the EIA Phase

An Ecological Impact Assessment (including Terrestrial Ecology, Aquatic Ecology and Avifauna) will be undertaken during the EIA Phase, which will include a site investigation. The findings of the assessment will be utilised to identify the most appropriate site for the proposed development, and any significant or fatal flaws that may arise within a particular site.

6.2 Visual Impacts

6.2.1 Key Issues

The activities that will be undertaken as part of the construction and operation phases of the proposed Kenhardt PV 1 project that will result in potential visual impacts are discussed below. This desktop study of potential visual impacts suggests that the main contributions to the significance of the visual impact for this project will focus on the proposed solar field and on-site substation during the operational phase of the plant.

▪ **Construction and Decommissioning Phases**

There are various aspects of the construction phase that will contribute to visual impacts caused by the proposed development:

- Large areas will be cleared of vegetation for the proposed solar field, equipment laydown areas and buildings;
- Construction activities and equipment associated with construction of the proposed development, including access roads and buildings;
- An increase in traffic can be expected on rural roads, particularly large construction and freight vehicles.
- The nightscape will potentially be affected by security and construction lighting at night;
- Construction of the overhead distribution lines and the onsite substation are likely to be visible against the skyline in places;
- Activities during construction of the proposed overhead distribution lines are likely to be visible against the skyline in places;
- Large areas cleared of vegetation will potentially generate dust which will draw attention to the development over a wide area (i.e. increase the visibility of construction activities);
- There is also potentially an increase in the risk of veld fires occurring during this phase which will have a similar visual effect to dust generation.

Key issues during the construction phase are:

- Potential visual intrusion of construction activities on the existing views of sensitive visual receptors in the rural landscape;
- Potential visual intrusion of a large area cleared of vegetation on the existing views of sensitive visual receptors; and
- Potential visual impact of night lighting during the construction phase on the nightscape of the region.

Similar potential visual impacts identified for the construction phase will be associated with the decommissioning phase.

▪ **Operational Phase**

A number of elements of the proposed PV solar plant will potentially intrude on the existing views of visual receptors. In particular, the very large solar field (thousands of 3 to 10 m high solar panels covering an area of up to 250 ha), tall structures such as the on-site substation, and overhead distribution lines connecting the plant with the national power grid at the Eskom Nieuwehoop Substation (which will be assessed separately as part of the BA Processes).

Key issues related to the operational phase of the development are:

- Potential landscape impact of introducing a large solar plant into a remote rural landscape;
- Potential visual intrusion of a large solar field on the existing views of sensitive visual receptors;

- Potential visual intrusion of tall, relatively large structures on the existing views of sensitive visual receptors; and
- Potential impact of night lighting of the development on the relatively dark rural nightscape.

6.2.2 Assessment to be undertaken during the EIA Phase

A Visual Impact Assessment specialist study will be conducted during the EIA Phase, which will include a site investigation in order to assess the potential visual impacts of the proposed development on the surrounding communities and regional setting. The Visual Impact Assessment will investigate the above and other concerns raised during the Scoping Phase of the EIA. The cumulative impact on the landscape and visual receptors of other similar projects in the region will also be assessed.

6.3 Archaeology (including Cultural Landscape)

6.3.1 Key Issues

Significant impacts to heritage resources are likely to be limited to archaeological resources may be easily avoided by the final layouts. Surface archaeological sites in Bushmanland tend to be very easy to record and sample and, as such, mitigation could be very easily effected should this be required. Based on desktop research, there are no fatal flaws and it is recommended that the proposed developments proceed to the EIA Phase. All the proposed sites are likely to be suitable for development in heritage terms.

Key issues during the construction and operational phases are:

- Direct disturbance and/or destruction of archaeological material;
- Direct impacts to the landscape through introduction of industrial type facilities; and
- Direct disturbance and/or destruction of possible graves (although unlikely).

6.3.2 Assessment to be undertaken during the EIA Phase

A Heritage Impact Assessment will be during the EIA Phase, which will include an assessment of the potential impacts associated with the proposed development on the heritage features present on site and the mitigation measures to be implemented to adequately protect these heritage features.

6.4 Palaeontology

6.4.1 Key Issues

The Kenhardt PV 1 (and the alternative site PV 1b) Solar PV facility study areas on Farm Onder Rugzeer 168 near Kenhardt are located in an area that is underlain by potentially fossiliferous sedimentary rocks of Late Tertiary or Quaternary age as well as by unfossiliferous basement rocks. The construction phase of the proposed development will entail substantial surface clearance and shallow excavations into the superficial sediment cover and locally into the underlying bedrock as well. These include, for example, excavations for the solar panel foundations, underground cables, internal access roads, laydown areas, and foundations for buildings. All these developments may adversely affect legally-protected fossil heritage resources within the study area by destroying, disturbing or permanently sealing-in fossils at or beneath the surface of the ground that are then no longer available for scientific research or other public good. The operational and decommissioning phases of the solar energy facilities are very unlikely to involve further adverse impacts on local palaeontological heritage, however.

As noted above, the construction phase of the proposed PV facility may entail the disturbance, damage or destruction of legally-protected fossil heritage resources preserved at or below the surface of the ground within the development footprint. All fossil material and palaeontological sites in South Africa are considered as part of the National Estate and are protected by the SAHRA. According to this act, it is illegal to disturb, damage or destroy any fossil heritage resources without a permit from the relevant Provincial Heritage Management authority, which in the present case is SAHRA (Contact details: Mrs Colette Scheermeyer, P.O. Box 4637, Cape Town 8000. Tel: 021 462 4502. Email: cscheermeyer@sahra.org.za).

6.4.2 Assessment to be undertaken during the EIA Phase

Based on the low palaeontological sensitivity of the area, a Palaeontological Heritage Desktop Assessment will be undertaken during the EIA Phase and it will include recommendations for inclusion in the EMP.

6.5 Geohydrology and Water Use

6.5.1 Key Issues

Water required during the construction phase will be mainly for human consumption (i.e. for drinking purposes and ablution facilities), whilst the operational phase will require water for panel washing as part of solar panel maintenance. As noted in Chapter 2 of this Scoping Report, the Project Applicant intends to make use of existing boreholes to source groundwater (if available and if suitable) for the solar panel cleaning process. The water will be transported from the boreholes to the facility via water pipelines (the routing of the pipelines will be provided during the EIA Phase). The groundwater (that may be sourced from the existing boreholes) will be stored on site in suitable containers or reservoir tanks (or similar) during the operational phase. It is estimated that the panel washing process will require approximately 4 million to 6 million litres of water per year during operations. The quality of the groundwater and its suitability for use will be ascertained as part of the Geohydrological Assessment to be conducted during this EIA Process. The water quality should be of drinking water quality and low in Total Dissolved Solids (TDS) for washing of the modules.

Therefore, the water requirements for the construction and operational phases are detailed below:

- 15 000 000 litres per year for construction (inclusive of dust mitigation) (the construction is planned to take 14 months).
- 4 million to 6 million litres per year for operations (minimum lifespan of 20 years).

Based on the preliminary research undertaken by the specialist, it has been determined that the proposed project will not impact on the groundwater resources of the area and from a geohydrological perspective the construction and operation can proceed. However, extreme care must be taken not to cause any contamination of groundwater. The main concerns are oil leaks from the construction vehicles and fuel spillages. These must be prevented. Any leaks or spills must be reported immediately and appropriate remediation measures implemented urgently.

Issues associated with the water supply are:

- Limited groundwater availability in the region;
- Water quality of the existing boreholes present within the study area;
- Borehole yields of existing boreholes that are present within the study area; and
- Potential contamination of groundwater as a result of construction activities.

6.5.2 Assessment to be undertaken during the EIA Phase

The feasibility and practicability of using groundwater via borehole abstraction will be further assessed during the EIA Phase, as part of the Geohydrological Assessment. Should it be deemed that the groundwater abstraction is not feasible, alternative water supply options, such as using municipal water, will be discussed within the EIA Report.

6.6 Soils and Agricultural Potential

6.6.1 Key Issues

A key issue for the development of solar projects in South Africa is the potential loss of agricultural land, especially land that has been cultivated or has high agricultural potential.

As noted in the previous chapters, the proposed Kenhardt PV 1 project is expected to cover an area of 250 ha of the remaining extent of Onder Rugzeer Farm 168, which is 5552 ha in extent, which is currently being used for livestock grazing and according to preliminary research undertaken by the specialist, the farm does not contain any cultivation. This area will be removed (to a certain extent) from the current land use potential of the farm if the solar project proceeds, although livestock grazing will continue outside the fenced solar facility and potentially inside once the internal project footprint has been rehabilitated.

The following have been identified as potential impacts on agricultural resources and productivity. All these impacts are local in extent, confined to the site.

- Loss of agricultural land use due to direct occupation by the infrastructural footprint of the development for the duration of the project (all phases). This will take affected portions of land out of agricultural production.
- Soil erosion by wind or water due to alteration of the land surface characteristics. Alteration of surface characteristics may be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard standing areas, surfaces and roads. Erosion will cause loss and deterioration of soil resources and may occur during all phases of the project.
- Degradation of veld vegetation beyond the direct facility footprint due to constructional disturbance and potential trampling by vehicles.
- Loss of topsoil due to poor topsoil management (burial, erosion, etc.) during construction related soil profile disturbance (levelling, excavations, road surfacing etc.) and resultant decrease in that soil's capability for supporting vegetation.
- Generation of alternative land use income through rental for energy facility. This will provide land owners with increased cash flow and rural livelihood, and thereby improve the financial sustainability of farming on site.
- Cumulative impacts due to the regional loss of agricultural resources and production as a result of other developments on agricultural land in the region.

The significance of potential agricultural impacts is influenced by the extremely limited agricultural capability of the site, with no cultivation on it. None of the above impacts are therefore likely to be of high significance. Mitigation measures can also be put in place to reduce the significance of many of these impacts.

Agricultural potential is uniformly low across the farm and the choice of placement of the facility on the farm therefore has minimal influence on the significance of agricultural impacts. Based on the preliminary research undertaken by the specialist, no agriculturally sensitive areas occur within the site.

6.6.2 Assessment to be undertaken during the EIA Phase

A Soils and Agricultural Potential Assessment will be undertaken during the EIA Phase in order to assess the potential impacts of the proposed development on soils and agricultural potential for both environmental and economic aspects on the site.

6.7 Social Issues

6.7.1 Key Issues

By far the most significant driver of change likely to result from the proposed project is the influx of people into the study area, and the corresponding increase in spending and employment. Such an influx of “strangers” into the receiving environment is likely to cause a disturbance in the order of the existing social structure and might also lead to increases in social deviance. Increased spending and employment (even though such employment might be short-term) generates positive impacts through the multiplier effect and by providing much needed financial relief in the area. However, it also creates significant, and often unrealistic, expectations regarding potential employment. The specific influence of anticipated impacts on woman and children will be an important consideration in the Social Impact Assessment.

Based on the status quo conditions of the study area and the nature of the proposed developments, the following social impacts are anticipated:

- Influx of jobseekers;
- Increased competition for urban-based employment;
- Increases in social deviance;
- Increases in incidence of HIV/AIDS infections;
- Expectations regarding jobs;
- Local spending;
- Local employment; and
- Job losses at the end of the project life-cycle.

6.7.2 Assessment to be undertaken during the EIA

A Social Impact Assessment will be undertaken during the EIA Phase. The study will include a detailed description of the local socio-economic conditions affected by the proposed project and will aim to identify the potential social opportunities and risks associated with the project. In doing so, the study will seek to identify measures that can be implemented to avoid and/or minimize the potential social risks. The study will also identify measures to enhance the potential social benefits associated with the proposed project.

6.8 Air Quality and Dust

Although the Sishen-Saldanha train transporting iron ore from Sishen to Saldanha runs intermittently past the site, the air quality of the area is generally good given that the area is predominantly agricultural and rural in character.

During the pre-construction phase the site will need to be cleared of vegetation, although the clearing of vegetation will only occur where roads, the on-site substation, foundations etc. need to be constructed, and the rest of the site will only be brush cut. The areas where the vegetation is cleared will expose bare soil to wind and as a result, dust will likely be generated from the movement of construction vehicles on the site. The generation of dust is expected to be short term and only last for the duration of the construction period. Standard dust control interventions used in civil construction projects will be applied in order to minimise dust generation. These interventions will be included in the EMP for the proposed project. It must also be borne in mind

that dust reduces the effectiveness of the PV panels and therefore it is in the operator's best interests to minimise the dust from the project site during the project lifetime.

6.8.1 Assessment to be undertaken during the EIA Phase

Given the above actions, the impact of the project on air quality is considered negligible and does not require a specialist study during the EIA Phase. The relevant management actions will be incorporated into EMPr that will form part of the EIA Reports.

6.9 Waste Generation

Solid waste will be generated during the construction phase and will likely consist of biodegradable waste (cleared vegetation), general waste (paper, packaging, plastics, food waste) and construction related waste such as metal off cuts, building rubble, steel reinforcement, etc. During the operational phase, general waste is expected to be generated from food wastes, packaging, paper, etc. Solid waste that might be produced during routine maintenance will be disposed at the closest registered landfill. There is no known solid waste that could be generated during the construction and operational phases that is classified as hazardous in terms of the relevant legislation. The associated impact is therefore considered negligible provided that an appropriate Waste Management Plan is efficiently implemented.

The proposed solar facility will also undergo routine maintenance which will necessitate the use of hydraulic oils, grease and other lubricants. Accidental spillage of small amounts of oil for machinery maintenance or from vehicles may contaminate the soil. Management and mitigation measures will be included in the EMPr to ensure optimal use and recycling of material and to minimize the possibility of soil pollution on site.

Waste water will also be generated from human activities (e.g. hand washing on the site) and water used for construction purposes (e.g. for site cleaning and washing equipment). Sewage will also be generated on site (portable ablutions) during the construction phase. It is proposed that municipal services will undertake the required waste removal and/or confirm suitable landfill space to accommodate the waste generated on site. Confirmation from the municipality will be sought during the EIA Phase.

During the decommissioning phase (if the facility will be decommissioned in the long-term), the removal of the supporting infrastructure (e.g. the cabling, fencing and control rooms, etc.) will generate waste. Recommendations regarding the management of decommissioning wastes will be included in the EMPr, e.g. where feasible, waste must be re-used or recycled. For example, steel support structures may be suitable for re-use elsewhere or recycled to form new products. The amount of waste will be limited during the decommissioning phase and is not expected to significantly reduce the capacity of the closest operational landfill.

6.9.1 Assessment to be undertaken during the EIA Phase

Given the existing knowledge about the anticipated waste outputs and the management measures in place, waste generation is not considered to require a specialist study during the EIA Phase. Appropriate waste management actions will be incorporated into the EMPr.

6.10 Noise Emissions

The operation of the proposed solar facility will not generate any significant sources of noise. In essence the operation will be silent, as no moving parts are used. Noise will be generated mainly from temporary maintenance and non-routine operations. The potential impacts of these temporary activities on noise emissions is not known at this stage, however it is most likely that the noise level will be under the threshold of acceptable emission targets. In addition, because of the locality of the proposed site, no sensitive receptors are present within 20 km of the site.

A potential key issue is noise generated by the construction activities, workers and vehicles on the site. The town of Kenhardt is the nearest large scale receptor, located approximately 30 km south west from the proposed site. Given this distance, it is predicted that any additional low level noise resulting from construction activities will be negligible.

6.10.1 Assessment to be undertaken during the EIA Phase

Appropriate noise management actions will be incorporated into the EMPr for the project that will form part of the EIA Reports.

6.11 Traffic Generation

During all phases (construction, operation and decommissioning) of the project, traffic will be generated. The highest traffic volumes (anticipated peak 40 - 50 truckloads per week over the estimated 14 month construction period) will be created during the construction phase. The activities that will generate traffic during the construction phase include site preparation and the transportation of construction materials and associated infrastructure to the site, as well as the transportation of employees to and from the site on a daily basis.

As previously noted, the main roads to be used are the R27 and R383 which, since both are important rural roads, would be classified as Category B roads, in accordance with TRH-4:2006 published by the Department of Transport, which means that these roads would have been designed for a minimum daily traffic exceeding 1000 (equivalent vehicle units). It is unclear what Average Daily Traffic (ADT) the Transnet Service Road and unnamed farm road were designed for, however since both the roads are gravel rural roads, it will most likely be classified as Category D roads and therefore will have a maximum daily traffic limit of 500 (equivalent vehicle units) (TRH-4:2006).

The closest roads to the site for which traffic counts are available show that the R383 (road between Kenhardt and Marydale) and the R361 (between Van Wyksvlei and Kenhardt) have ADTs of 35 and 41, respectively (SANRAL, 2007). The ADTs show that the current traffic volumes are well below the maximum traffic limits for the roads discussed above. Even though traffic will be generated during the construction and operation of the proposed solar PV facility, given the low ADTs of the surrounding roads, it is not expected that the traffic generated by the facility will exceed the maximum daily traffic limits for the abovementioned roads.

6.11.1 Assessment to be undertaken during the EIA Phase

The anticipated traffic loads on the R27, R383, unnamed farm road and Transnet Service Road are expected to be significantly less than the design capacity of these roads. With this in mind, the traffic volumes contributed by the construction and operation phases of the facility on the existing traffic volumes are considered acceptable. To this end, a Traffic Impact Statement (which will include management measures for road maintenance) will be prepared by the EAP, which will provide recommendations for inclusion in the EMPr. The same approach was followed by the CSIR for the proposed Nieuwehoop Solar EIA Project which is currently at the decision-making stage of the EIA.

6.12 Proximity to the SKA Project

As noted in Chapter 4 of this Scoping Report, the Astronomy Geographic Advantage (Act 21 of 2007) aims is to provide for the preservation and protection of areas within the Republic that are uniquely suited for optical and radio astronomy; to provide for intergovernmental co-operation and public consultation on matters concerning nationally significant astronomy advantage areas; and to provide for matters connected therewith. The proposed project site falls within 20 km of a SKA station and according to the SKA Project Office, based on distance to the nearest SKA station, the location of the station, and the information currently available on the design of the proposed PV installation, the proposed facility poses a medium to high risk of detrimental impact on the SKA.

6.12.1 Assessment to be undertaken during the EIA Phase

Based on the comments received from the SKA, dated 17 August 2015 (and included in Chapter 7 and Appendix G of this Scoping Report), Electro Magnetic Interference and Radio Frequency Interference studies must be undertaken to determine appropriate mitigation and management measures to reduce the risk of a detrimental impact on the SKA project. These studies will be undertaken and included in the EIA Report.

6.13 Cumulative Impacts

The cumulative impacts will be assessed by identifying other solar energy project proposals and other applicable projects, such as construction and upgrade of electricity generation, transmission or distribution facilities in the local area (i.e. within 20 km of the proposed Kenhardt PV projects) that have been approved (i.e. positive EA has been issued) or the EIA is currently underway. The cumulative impacts will be assessed in terms of each proposed Kenhardt PV project as well.

Cumulative effects associated with these similar types of projects include inter alia:

- Traffic generation;
- Avifaunal collisions and mortalities;
- Habitat destruction and fragmentation;
- Loss of agricultural land;
- Removal of vegetation;
- Increase in stormwater run-off and erosion;
- Increase in water requirements;
- Job creation;
- Increased interference to the SKA project;
- Social upliftment; and
- Upgrade of infrastructure and contribution of renewable energy into the National Grid.

The projects that are being undertaken or are proposed to be undertaken within 20 km of the proposed project are detailed in Table 6.1.

Table 6.1: EIA Processes currently underway within 20 km of the proposed project

Project Name	Applicant	DEA Reference Number	Brief project description	Phase
Nieuwehoop 400/50 kV Substation loop in and loop out lines, Northern Cape Province.	Eskom Holdings SOC Limited	DEA Reference Number: 12/12/20/1166	Construction of the 400/50kv Nieuwehoop substation between the Garona and Aries substations, and 3km Loop In and Loop Out Lines.	The project received a positive EA on 21 February 2011. Site preparation for the construction of the Nieuwehoop Substation has commenced.
EIA, WULA and EMPr for the proposed Solar CSP Integration Project: Project 1 - Solar substation, 2 X 400 kV power lines from Aries to the solar substation and 400 kV power line from Nieuwehoop to the Solar substation.	Eskom Holdings SOC Limited	DEA Reference Number: 12/12/20/2606 NEAS Reference Number: DEA/EIA/0000785/2011	The proposed Solar Park Integration Project entails the construction of a substation at the Upington Solar Park, 400 kV transmission lines to the east and south of Upington to feed the electricity into Eskom's National Grid as well as the construction of a number of 132 kV power lines inter-linking the IPP solar plants with the Eskom Grid and distributing the power generated to Upington.	The project received a positive EA on 14 February 2014.
Proposed construction of Gemsbok PV1 75 MW Solar PV facility on the remaining extent of Portion 3 of the Farm Gemsbok Bult 120, Kenhardt, Northern Cape (i.e. this project).	Mulilo Renewable Project Developments (Pty) Ltd	DEA Reference Number: 14/12/16/3/3/2/710	Mulilo Renewable Project Developments (Pty) Ltd intends to develop a 75 MW Solar PV power generation project on the farm Gemsbok Bult (Remaining Extent of Portion 3 of Farm 120).	These projects are being undertaken in parallel (i.e. joint PPP) and are collectively referred to as the Nieuwehoop Solar Development. The Final EIA Reports have been submitted to the DEA for decision-making. The 21-day comment period on the Final EIA Reports has concluded and has been submitted to the DEA for decision-making.
Proposed construction of Gemsbok PV2 75 MW Solar PV facility on the remaining extent of Portion 3 of the Farm Gemsbok Bult 120, Kenhardt, Northern Cape.	Mulilo Renewable Project Developments (Pty) Ltd	DEA Reference Number: 14/12/16/3/3/2/711	Mulilo Renewable Project Developments (Pty) Ltd intends to develop a 75 MW Solar PV power generation project on the farm Gemsbok Bult (Remaining Extent of Portion 3 of Farm 120).	
Proposed construction of Boven PV1 75 MW Solar PV facility on the remaining extent of the Farm Boven Rugzeer 169, Kenhardt, Northern Cape.	Mulilo Renewable Project Developments (Pty) Ltd	DEA Reference Number: 14/12/16/3/3/2/712	Mulilo Renewable Project Developments (Pty) Ltd intends to develop a 75 MW Solar PV power generation project on the farm Boven Rugzeer (Remaining Extent of Farm 169).	
Proposed development of a 75 MW Solar PV Facility (Kenhardt PV 2) on the remaining extent of Onder Rugzeer Farm 168, north-east of Kenhardt, Northern Cape.	Scatec Solar	To be confirmed	Scatec Solar intends to develop a 75 MW Solar PV power generation project on the remaining extent of Onder Rugzeer Farm 168.	These projects are being undertaken in parallel (i.e. joint PPP). The Scoping Reports are being released for a 30-day comment period.
Proposed development of a 75 MW Solar PV Facility (Kenhardt PV 3)	Scatec Solar	To be confirmed	Scatec Solar intends to develop a 75 MW Solar PV power generation project on the remaining extent	

Project Name	Applicant	DEA Reference Number	Brief project description	Phase
on the remaining extent of Onder Rugzeer Farm 168, north-east of Kenhardt, Northern Cape.			of Onder Rugzeer Farm 168.	
Proposed development of a 132 kV Transmission Line to connect to the proposed 75 MW Solar PV Facility (Kenhardt PV 1) on the remaining extent of Onder Rugzeer Farm 168 and the remaining extent of Portion 3 of Gembok Bult Farm 120, north-east of Kenhardt, Northern Cape.	Scatec Solar	To be confirmed	Scatec Solar intends to develop a 132 KV transmission line extending from the proposed 75 MW Solar PV facility (Kenhardt PV 1) to the Eskom Nieuwehoop substation on the remaining extent of Portion 3 of Gembok Bult Farm 120.	These projects are being undertaken in parallel with Kenhardt PV 1, Kenhardt PV 2 and Kenhardt PV 3 (i.e. joint PPP). The BA Reports will be released for a 30-day comment period during the EIA Phase.
Proposed development of a 132 kV Transmission Line to connect to the proposed 75 MW Solar PV Facility (Kenhardt PV 2) on the remaining extent of Onder Rugzeer Farm 168, and the remaining extent of Portion 3 of Gembok Bult Farm 120, north-east of Kenhardt, Northern Cape.	Scatec Solar	To be confirmed	Scatec Solar intends to develop a 132 KV transmission line extending from the proposed 75 MW Solar PV facility (Kenhardt PV 2) to the Eskom Nieuwehoop substation on the remaining extent of Portion 3 of Gembok Bult Farm 120.	
Proposed development of a 132 kV Transmission Line to connect to the proposed 75 MW Solar PV Facility (Kenhardt PV 3) on the remaining extent of Onder Rugzeer Farm 168, and the remaining extent of Portion 3 of Gembok Bult Farm 120, north-east of Kenhardt, Northern Cape.	Scatec Solar	To be confirmed	Scatec Solar intends to develop a 132 KV transmission line extending from the proposed 75 MW Solar PV facility (Kenhardt PV 3) to the Eskom Nieuwehoop substation on the remaining extent of Portion 3 of Gembok Bult Farm 120.	
Proposed construction of the Mulilo Solar Development consisting of seven 75 MW PV OR Concentrated PV Solar Energy Facilities and associated infrastructure near Kenhardt, Northern Cape	Mulilo Renewable Project Developments (Pty) Ltd	To be confirmed	Mulilo Renewable Project Developments (Pty) Ltd proposes to construct and operate seven PV or Concentrated PV Solar Facilities with a generating capacity of 75 MW each, on Portions 3 and 8 of Gembok Bult Farm 120 and the Remaining extent of Boven Rugzeer Farm 169, located 30 km north-east of Kenhardt. Two of the projects will be located on Portion 3-, two projects on Portion 8 of	

Project Name	Applicant	DEA Reference Number	Brief project description	Phase
			<p>Gemsbok Bult Farm 120 and three projects on the Remaining Extent of Boven Rugzeer Farm 169. Each 75 MW Solar PV facility proposed will cover an approximate area of 200 ha with a collective footprint of approximately 1 400 ha and a combined power generation capacity of 525 MW. The proposed projects will entail the construction of the solar field, buildings, electrical infrastructure, internal access roads, and associated infrastructure and structures.</p>	

SCOPING REPORT



CHAPTER 7: Issues and Responses Trail

Scoping and Environmental Impact Assessment for the Proposed Development of a 75 MW Solar Photovoltaic Facility (KENHARDT PV 1) on the remaining extent of Onder Rugzeer Farm 168, north-east of Kenhardt, Northern Cape Province

contents

7	ISSUES AND RESPONSES TRAIL	7-2
7.1	Identification of Issues	7-2
7.2	Issues and Responses Trail	7-4

figures

Figure 7.1:	Decision-making framework for identifying key issues for the EIA	7-3
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7 ISSUES AND RESPONSES TRAIL

This chapter presents the approach to evaluating the issues raised during the Scoping Phase and provides a summary of all issues which have been raised by I&APs and Organs of State.

7.1 Identification of Issues

An important element of the Scoping Process is to evaluate the issues raised through the Scoping interactions with authorities, the public, the specialists on the EIA team and the project proponent. In accordance with the philosophy of Integrated Environmental Management, it is important to focus the EIA on the key issues, such as those issues that are considered critical for decision-making on the EA.

To assist in the identification of key issues, a decision-making process is applied to the issues raised, based on the following criteria (Refer to Figure 7.1):

- Whether or not the issue falls within the scope and responsibility of the proposed Kenhardt PV 1 project;
- Whether or not sufficient information is available to respond to the issue raised without further specialist investigation.

Issues were sourced by the EIA team from the following Scoping interactions:

- **Newspaper Advertisement** - In order to inform the public of the proposed project and invite members of the public to register as I&APs, and to inform the EIA consultant about specific issues or interests in the proposed project, the project and EIA Process was advertised in one local newspaper (i.e. The Gemsbok) on 29 July 2015 during the Scoping Phase. A copy of the newspaper advertisement is included in Appendix D of this Scoping Report.
- **Email** - Issues were sent to the CSIR via email correspondence.
- **Comment Form** - issues submitted to the CSIR via the Comment and Registration Form that was provided with Letter 1 and the BID mailed to I&APs.

All comments received during the 30-day review of the BID and prior to the release of this Scoping Report for I&AP review are included in the Issues Trail below, as well as in Appendix G of the Scoping Report. Section 7.2 below provides a summary of the comments received and they have been grouped according to the following categories (the number in brackets indicates the number of issues raised):

- EIA Process and Public Participation (5)
- Project Description and Impact on Existing Infrastructure (7)

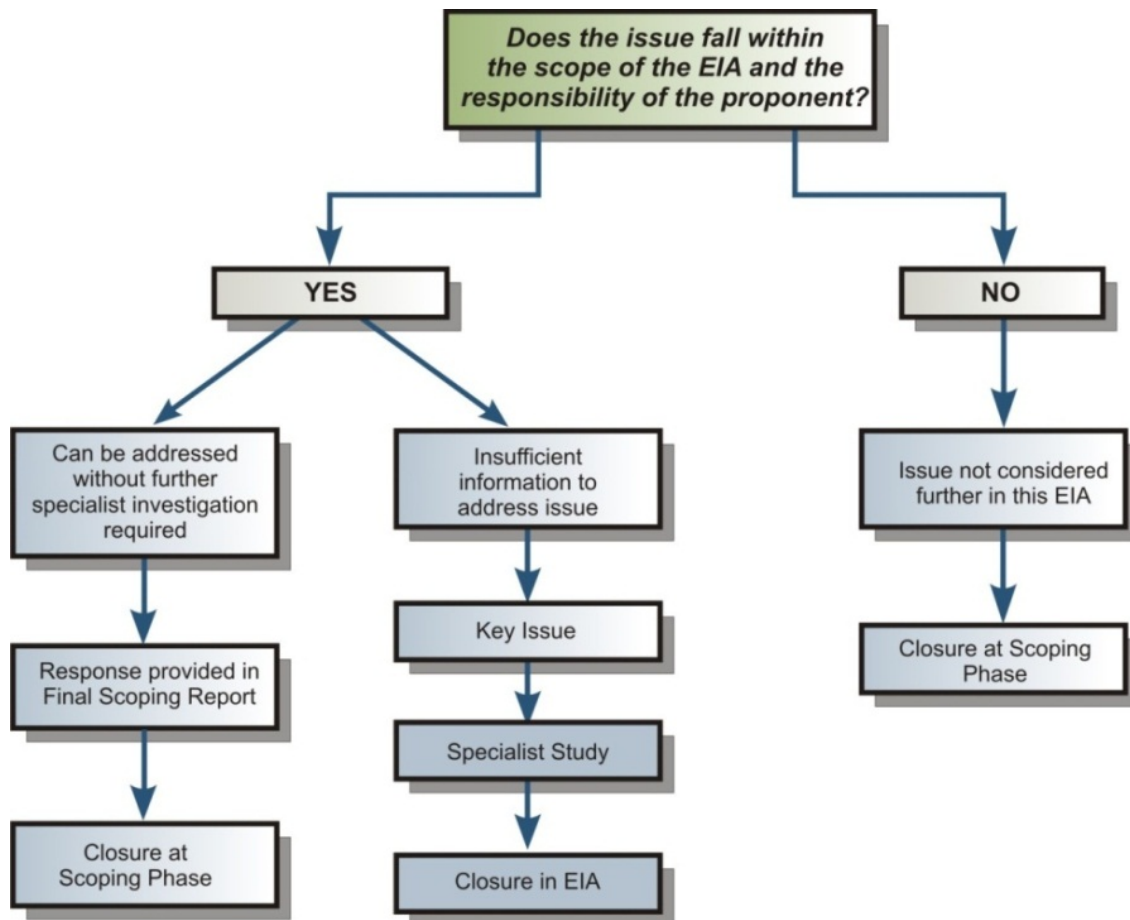


Figure 7.1: Decision-making framework for identifying key issues for the EIA

7.2 Issues and Responses Trail

The tables below summarise the issues raised prior to the release of the Scoping Report for I&AP review, together with a response from the EIA team. A synthesis of issues to be addressed in the Specialist Studies is provided in the Plan of Study for EIA (Chapter 8). The results of the Specialist Studies will be made available to I&APs for comment as part of the PPP undertaken for the EIA Report.

1. EIA Process and Public Participation

NO	ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
1.1	Kindly register me as an I&AP for the proposed development with CSIR Reference: EMS0102/SCATEC/2015.	Samantha De la Fontaine, District Ecologist, Northern Cape Department of Environment and Nature Conservation	29 July 2015, Email	CSIR: Comment noted. Samantha De la Fontaine has been added to the project I&AP database. Refer to Appendix C of this Scoping Report for a copy of the current database of I&APs.
1.2	Attached please find the completed comment and registration form.	Karen Low, Environmental Manager, Mulilo Renewable Project Developments	29 July 2015, Email and Comment and Registration Form	CSIR: Comment noted. Mulilo Renewable Project Developments was identified as an I&AP and thus pre-included on the project database of I&APs and Organs of State at the outset of the Scoping and EIA Process. Refer to Appendix C of this Scoping Report for a copy of the current database of I&APs.
1.3	Your company is currently conducting an Environmental Impact Assessment for the Proposed Development of Three Solar Photovoltaic Facilities and Associated Electrical Infrastructure North East of Kenhardt. Please could you forward me the BID for this application and register me as a Interested & Affected party?	Melanie Miles, Content Researcher, Leads 2 Business	3 August 2015, Email	CSIR: Comment noted. Melanie Miles has been added to the project I&AP database. Refer to Appendix C of this Scoping Report for a copy of the current database of I&APs. A copy of the BID was also provided to Melanie Miles via email.
1.4	Your notice received with regards to Basic Assessment; Scoping and Environmental Impact Assessment for the Proposed Development of the three Solar Photovoltaic Facilities and Associated Electrical Infrastructure; North-East of Kenhardt; Northern Cape is of reference. DWS requires you to forward hard copies of the above mentioned project to either of the following address:	Melinda Mei, Senior Administration Clerk, Water Quality Management: Lower Orange Water Management Area, Department of	4 August 2015, Email	CSIR: Comment noted. The Department of Water and Sanitation was identified as a key stakeholder and thus pre-included on the project database of I&APs and Organs of State at the outset of the Scoping and EIA Process. Refer to Appendix C of this Scoping Report for a copy of the current database of I&APs. Hard copies of the BID, including Letter 1 and a Comment and Registration Form, were sent to Mashudu Randwedzi and Melinda

NO	ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
	Physical Address: Department Of Water and Sanitation Louisvale Road Upington 8801 OR Postal Address: Department Of Water and Sanitation Private Bag X 5912 Upington 8800	Water and Sanitation		Mei of the Department of Water and Sanitation via registered post on 30 July 2015, at the following postal address: Private Bag X5912; Upington; 8800. The BID, Letter 1 and the Comment and Registration Form were also sent to these representatives of the Department of Water and Sanitation via email on 29 July 2015. Refer to Appendix E of this Scoping Report for the registered mailing receipts and email delivery.
1.5	I want to register for the facility because I support the project.	John de Bruin, Henrohn Security	25 August 2015, Email	CSIR: Comment noted. John de Bruin has been added to the project I&AP database. Refer to Appendix C of this Scoping Report for a copy of the current database of I&APs. A telephonic discussion was also held with John de Bruin on 21 August 2015.

2. Project Description and Impact on Existing Infrastructure

NO	ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
2.1	The following immediate concerns are: <ul style="list-style-type: none"> Possible glare from the solar panels which may influence the Train Drivers and staff travel on the TFR service road. Future concerns: <ul style="list-style-type: none"> During construction, planned access routes to the facilities that might influence TFR (Dust on High Voltage Electrical Equipment). The location of the High Voltage transmission lines. Level crossing requirements (High risk of 	Gilbert Nortier, Depot Engineering Manager, Transnet Freight Rail	19 August 2015, Email	CSIR and Scatec Solar: <ul style="list-style-type: none"> Comment noted. The impact of glare from the solar panels will be considered during the EIA Phase. However, it is important to note that the anticipated glare produced by the solar PV panels will not exceed the Standard Industry Norm generally accepted throughout South Africa. If a single axis tracker mounting system is employed, it will require PV arrays to be laid out in a North - South orientation, allowing the system to then track in an east - west orientation (as noted in Chapter 2 of this Scoping Report). The single axis tracker mounting system will also minimize glare drastically to the North and South of the proposed PV facility.

NO	ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
	<p>accidents).</p> <ul style="list-style-type: none"> ▪ During maintenance same issues as above. 			<p>Furthermore, the glass used in the manufacture of PV panels is designed to maximize the absorption of light (to improve the energy efficiency of the panels) and minimize reflection and glare. PV panels are less reflective than water and it is therefore not anticipated to influence train drivers and users of the TFR Service Road.</p> <ul style="list-style-type: none"> ▪ As noted in Chapters 1 and 2 of this Scoping Report, existing roads (such as a private Transnet Service Road or an unnamed farm road) will be used to gain access to the preferred site. The Transnet Service Road can be accessed from the R27 and the farm road can be accessed from the R383 Regional Road also via the R27 National Road. Discussions will be held between Transnet Freight Rail and the Project Applicant during the EIA Phase to discuss the requirements for use of the Transnet Service Road. Dust may be generated during the construction phase, however it is expected to be of a short-term duration and insignificant. However, where applicable, mitigation measures relating to potential dust impacts will be included in the EMPr, which will be completed during the EIA Phase. ▪ As noted in Chapters 1 and 2 of this Scoping Report, the transmission line will extend between the proposed Solar Facility and the Eskom Nieuwehoop Substation. A 132 kV transmission line will be constructed for each solar facility and will be assessed separately as part of a BA Process. ▪ Recommendations and mitigation measures to reduce the risk of accidents as a result of the nearby ore railway line will be included in the EMPr, which will be compiled during the EIA Phase. Transnet will be provided with an opportunity to comment on the recommendation included in the EMPr during the EIA Phase which will be considered prior to submission to the Competent Authority, the DEA, for decision-making.
2.2	<p>This letter is in response to your email request, to provide an assessment on the potential development of three solar PV electricity generation facilities in the Northern Cape Province and the risk they may pose on</p>	<p>Dr. Adrian Tiplady Head: Strategy, SKA South Africa</p>	<p>2 September 2015, Letter via email</p>	<p>CSIR and Scatec Solar:</p> <ul style="list-style-type: none"> ▪ Comment noted. The distance of the proposed project to the nearest SKA station has been included in Chapter 4 of

NO	ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
	<p>the Square Kilometre Array Project.</p> <p>A high level risk assessment has been conducted at the South African SKA Project Office to determine the potential impact of such facilities on the Square Kilometre Array. This letter serves to confirm the outcomes of the risk assessment, and proposals for any future investigations associated with this facility.</p> <ul style="list-style-type: none"> ▪ The location of the proposed facility has been provided in the background information document compiled by CSIR; ▪ The nearest SKA station has been identified as SKA Station ID 2362, at approximately 20 km from the proposed installation; ▪ Based on distance to the nearest SKA station, and the information currently available on the detailed design of the PV installations, these facilities poses a medium to high risk of detrimental impact on the SKA; ▪ Any transmitters that are to be established, or have been established, at the site for the purposes of voice and data communication will be required to comply with the relevant AGA regulations concerning the restriction of use of the radio frequency spectrum that applies in the area concerned; ▪ As a result of the medium to high risk associated with the PV facilities, The SKA project office recommends that further EMI and RFI detailed studies be conducted as significant mitigation measures would be required to lower the risk of detrimental impact to an acceptable level. The South African SKA Project Office would like to be kept informed of progress with this project, and reserves the right to further risk assessments at a later stage. 			<p>this Scoping Report.</p> <ul style="list-style-type: none"> ▪ Comment noted. Scatec Solar will comply with the requirements from the SKA Project Office. Electromagnetic Interference (EMI) and Radio Frequency Interference (RFI) detailed studies will be commissioned by Scatec Solar. The SKA Project Office will be consulted with during the EIA Phase in order to confirm the requirements and specifications of these studies. ▪ The SKA Project Office has been included on the project database as a key stakeholder, since the commencement of the EIA Process. The SKA Project Office will be kept informed of project progress.

NO	ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
	<p>This technical advice is provided by the South African SKA Project Office on the basis of the protection requirements of the SKA in South Africa, and does not constitute legal approval of the renewable energy projects in terms of the Astronomy Geographic Advantage Act, the Management Authority, and its regulations or declarations.</p>			
2.3	<p>Thank you for your letter dated 29 July 2015, send to Mr van der Walt.</p> <p>Please note that this solar development will not impact on a national road, therefore SANRAL has no jurisdiction and have no further comment with regard to the Solar Facility.</p> <p>Should any service, e.g. power line and/or water pipe will be situated within 60m from the national road or will cross the national road application should be made to SANRAL for approval in terms of the National Roads Act.</p>	René de Kock, Statutory Control, SANRAL	4 September 2015, Email	<p>CSIR: Comment noted. Based on the conceptual design, it is not anticipated that any service infrastructure will be located within 60 m of the national road, or crossing the national road. It is duly noted that if the aforementioned is required, application will be lodged with the SANRAL by the Applicant.</p>

SCOPING REPORT



CHAPTER 8:

Plan of Study for EIA

Scoping and Environmental Impact Assessment for the Proposed Development of a 75 MW Solar Photovoltaic Facility (KENHARDT PV 1) on the remaining extent of Onder Rugzeer Farm 168, north-east of Kenhardt, Northern Cape Province

contents

8 PLAN OF STUDY FOR EIA **8-2**

8.1	Purpose of EIA and Requirements of the 2014 EIA Regulations	8-2
8.2	Overview of Approach to Preparing the EIA Report and EMPr	8-3
8.3	Public Participation Process	8-3
8.4	Authority Consultation during the EIA Phase	8-5
8.5	Approach to Impact Assessment and Specialist Studies	8-6
	8.5.1 <i>Generic TOR for the Assessment of Potential Impacts</i>	8-6
8.6	Issues to be addressed in the Specialist Studies	8-10
8.7	Alternatives to be assessed in the EIA Phase	8-13
8.8	TOR for the Specialist Studies	8-13
	8.8.1 <i>Ecological Impact Assessment (including Terrestrial Ecology, Aquatic Ecology and Avifauna)</i>	8-14
	8.8.2 <i>Visual Impact Assessment</i>	8-16
	8.8.3 <i>Heritage Impact Assessment (Archaeology and Cultural Landscape)</i>	8-17
	8.8.4 <i>Desktop Palaeontological Impact Assessment</i>	8-18
	8.8.5 <i>Geohydrological Assessment</i>	8-18
	8.8.6 <i>Soil and Agricultural Potential Assessment</i>	8-18
	8.8.7 <i>Social Impact Assessment</i>	8-19
8.9	Key Milestones of the EIA Process	8-20

tables

Table 8.1:	Requirements for Plan of Study for EIA in accordance with the 2014 EIA Regulations	8-2
Table 8.2:	Authority Communication Schedule	8-6
Table 8.3:	Example of Table for Assessment of Impacts	8-9
Table 8.4:	Summary of Issues to be addressed during the EIA Phase as part of the specialist studies/input	8-10
Table 8.5:	Specialist Studies and Associates Specialists	8-14

8 PLAN OF STUDY FOR EIA

This chapter presents the Plan of Study for the EIA (PSEIA), which sets out the process to be followed in the EIA Phase (as required by the 2014 EIA Regulations). The PSEIA is based on the outcomes of the Scoping Phase (to date) and provides the Terms of Reference (TOR) for the specialist studies that have been identified, the alternatives that will be considered and assessed, as well as the PPP that will be undertaken during the EIA Phase.

8.1 Purpose of EIA and Requirements of the 2014 EIA Regulations

The purpose of the EIA Phase is to:

- Address issues that have been identified through the Scoping Process;
- Assess alternatives to the proposed activity in a comparative manner;
- Assess all identified impacts and determine the significance of each impact; and
- Recommend actions to avoid/mitigate negative impacts and enhance benefits.

The EIA Phase consists of three parallel and overlapping processes:

- Central assessment process through which inputs are integrated and presented in an EIA Report that is submitted for approval to the DEA and other commenting authorities (Sections 8.2, 8.3, and 8.4);
- Undertaking of a PPP whereby findings of the EIA Phase are communicated and discussed with I&APs and responses are documented (Section 8.3);
- Undertaking of specialist studies that provide additional information/assessments required to address the issues raised in the Scoping Phase (Sections 8.5, 8.6 and 8.7).

Table 8.1 below shows the requirements for the PSEIA in accordance with Appendix 2 (2) (i) of the 2014 EIA Regulations.

Table 8.1: Requirements for Plan of Study for EIA in accordance with the 2014 EIA Regulations

Section of the EIA Regulations: Appendix 2 (2) (i)	Requirements for a Scoping Report in terms of Appendix 2 of the 2014 NEMA EIA Regulations (GN R982)	Location in this Chapter
i.	A plan of study for undertaking the EIA process to be undertaken, including - <ul style="list-style-type: none"> ▪ a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity; 	Section 8.7
ii.	<ul style="list-style-type: none"> ▪ a description of the aspects to be assessed as part of the environmental impact assessment process; 	Section 8.8
iii.	<ul style="list-style-type: none"> ▪ aspects to be assessed by specialists; 	Section 8.8
iv.	<ul style="list-style-type: none"> ▪ a description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists; 	Section 8.5
v.	<ul style="list-style-type: none"> ▪ a description of the proposed method of assessing duration and significance; 	Section 8.5
vi.	<ul style="list-style-type: none"> ▪ an indication of the stages at which the competent authority will be consulted; 	Section 8.3 and Section 8.4
vii.	<ul style="list-style-type: none"> ▪ particulars of the public participation process that will be conducted during the environmental impact assessment process; 	Section 8.3 and Section 8.4
viii.	<ul style="list-style-type: none"> ▪ a description of the tasks that will be undertaken as part of the environmental impact assessment process; and 	Section 8.2, Section 8.3 and Section 8.4

Section of the EIA Regulations: Appendix 2 (2) (i)	Requirements for a Scoping Report in terms of Appendix 2 of the 2014 NEMA EIA Regulations (GN R982)	Location in this Chapter
ix.	<ul style="list-style-type: none"> ▪ identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored. 	Section 8.8

8.2 Overview of Approach to Preparing the EIA Report and EMPr

The results of the specialist studies and other relevant project information for the Kenhardt PV 1 project will be summarised and integrated into the EIA Report. The EIA Report will be released for a 30-day I&AP and authority review period, as outlined in Sections 8.3 and 8.4 of this chapter. All registered I&APs on the project database will be notified in writing of the release of the EIA Report for review. Should it be deemed necessary (based on feedback on the Scoping Process), one public meeting can be arranged during this review period, or following requests from stakeholders, several focus group meetings with key I&APs and stakeholders can instead be arranged. The purpose of these meetings (if deemed necessary) will be to provide an overview of the outcome and recommendations from the specialist studies, as well as provide opportunity for comment. Comments raised, through written correspondence (emails, comments, forms) and at meetings (public meeting and/or focus group meetings) will be captured in a Comments and Responses Trail for inclusion in the EIA Reports that will be submitted to the DEA for decision-making in terms of Regulation 23 (1) (a) of the 2014 EIA Regulations. Comments raised will be responded to by the EIA team and/or the applicant. These responses will indicate how the issue has been dealt with in the EIA Process. Should the comment received fall beyond the scope of this EIA, clear reasoning will be provided. All comments received (and the associated responses from the EIA team) will be attached as an appendix to the EIA Report for submission to the DEA.

The EIA Report will include an EMPr, which will be prepared in compliance with the relevant regulations (i.e. Appendix 4 of the 2014 EIA Regulations). This EMPr will be based broadly on the environmental management philosophy presented in the ISO 14001 standard, which embodies an approach of continual improvement. Actions in the EMP will be drawn primarily from the management actions in the specialist studies for the construction and operational phases of the project. If the project components are decommissioned or re-developed, this will need to be done in accordance with the relevant environmental standards and clean-up/remediation requirements applicable at the time.

8.3 Public Participation Process

The key steps in the PPP for the EIA Phase are described below. This approach will be confirmed with the provincial and national environmental authorities through their review of the PSEIA.

The PPP for the Scoping Process is described in Chapter 4 of this Scoping Report. As discussed in Chapter 1 and Chapter 4 of this Scoping Report, an integrated PPP will be undertaken for the three Scoping and EIA projects (i.e. Kenhardt PV 1, Kenhardt PV 2, and Kenhardt PV 3), as well as the three BA projects (i.e. Kenhardt PV 1 - Transmission Line, Kenhardt PV 2 - Transmission Line, and Kenhardt PV 3 - Transmission Line). Separate Scoping, BA and EIA Reports will be compiled for each project and these will be made available at in an integrated manner. All advertisements, notification letters and emails etc. will serve to notify the public and organs of state of the joint availability of all reports for the abovementioned projects and will provide I&APs with an opportunity to comment on the reports. As previously noted, the BA Reports will be released with the EIA Reports in order to comply with the timeframes stipulated in the 2014 EIA Regulations. This process is outlined in Figure 4.1 included in Chapter 4 of this Scoping Report. Based on the close proximity of the sites (i.e. the same geographical area), the same PPP approach will be followed for the EIA Phase.

TASK 1: I&AP REVIEW OF THE EIA REPORT AND EMPR

The first stage in the process will entail the release of the EIA Reports for a 30-day I&AP and stakeholder review period. Relevant organs of state and I&APs will be informed of the review process in the following manner:

- Placement of one advertisement in The Gemsbok local newspaper to notify potential I&APs of the availability of the EIA Reports;
- A letter will be sent via registered mail and email to all registered I&APs and organs of state (where postal, physical and email addresses are available) on the database. The letter will include notification of the 30-day comment period for the EIA Reports, as well as an invitation to attend the public meeting and/or focus group meetings, if required. The letter will include an Executive Summary of the EIA Reports and a Comment and Registration Form;
- A public meeting could possibly be held during the review of the EIA Report, if warranted, and if there is substantial public interest during the EIA Phase. Furthermore, telephonic consultations with key I&APs will take place, upon request; and
- Meeting(s) with key authorities involved in decision-making for this EIA (if required and requested).

The EIA Reports will be made available and distributed through the following mechanisms to ensure access to information on the project and to communicate the outcome of specialist studies:

- Copies of the reports will be placed at the Kenhardt and Groblershoop local libraries for I&APs to access for viewing;
- Key authorities will be provided with either a hard copy and/or CD of the EIA Reports;
- The EIA Reports will be uploaded to the project website (i.e. <http://www.csir.co.za/eia/ScatecSolarPV/>); and
- Telephonic consultations will be held with key I&AP and organs of state groups, as necessary.

TASK 2: COMMENTS AND RESPONSES TRAIL

A key component of the EIA Process is documenting and responding to the comments received from I&APs and the authorities. The following comments on the EIA Reports will be documented:

- Written and emailed comments (e.g. letters and completed comment and registration forms);
- Comments made at public meetings and/or focus group meetings (if required);
- Telephonic communication with CSIR project team; and
- One-on-one meetings with key authorities and/or I&APs (if required).

The comments received during the 30-day review of the EIA Reports will be compiled into a Comments and Responses Trail for inclusion in an appendix to the EIA Reports that will be submitted to the National DEA in terms of Regulation 23 (1) (a) for decision-making. The Comments and Responses Trail will indicate the nature of the comment, as well as when and who raised the comment. The comments received will be considered by the EIA team and appropriate responses provided by the relevant member of the team and/or specialist. The response provided will indicate how the comment received has been considered in the EIA Reports for submission to the National DEA and in the project design or EMPRs.

TASK 3: COMPILATION OF EIA REPORTS FOR SUBMISSION TO THE DEA

Following the 30-day commenting period of the EIA Reports and incorporation of the comments received into the reports, the EIA Reports (i.e. hard copies and electronic copies) will be submitted to the DEA for decision-making in line with Regulation 23 (1) of the 2014 EIA Regulations. In line with best practice, I&APs on the project database will be notified via email (where email addresses are available) of the submission of the EIA Reports to the DEA for decision-making.

The EIA Reports that are submitted for decision-making will also include proof of the PPP that was undertaken to inform organs of state and I&APs of the availability of the EIA Reports for the 30 day review (during Task 1, as explained above). To ensure ongoing access to information, copies of the EIA Reports that are submitted for decision-making and the Comments and Response Trail (detailing comments received during the EIA Phase and responses thereto) will be placed on the project website (i.e. <http://www.csir.co.za/eia/ScatecSolarPV/>).

The DEA will have 107 days (from receipt of the EIA Reports) to either grant or refuse EA (in line with Regulation 24 (1) of the 2014 EIA Regulations).

TASK 4: EA AND APPEAL PERIOD

Subsequent to the decision-making phase, if an EA is granted by the DEA for the proposed projects, all registered I&APs and stakeholders on the project database will receive notification of the issuing of the EA and the appeal period. The 2014 EIA Regulations (i.e. Regulation 4 (1)) states that after the Competent Authority has reached a decision, it must inform the Applicant of the decision, in writing, within 5 days of such decision. Regulation 4 (2) of the 2014 EIA Regulations stipulates that I&APs need to be informed of the EA and associated appeal period within 14 days of the date of the decision. All registered I&APs will be informed of the outcome of the EA and the appeal procedure and its respective timelines.

The following process will be followed for the distribution of the EA (should such authorisation be granted by the DEA) and notification of the appeal period:

- Placement of one advertisement in The Gemsbok local newspaper to notify I&APs of the EA and associated appeal process;
- A letter will be sent via registered mail and email to all registered I&APs and organs of state (where postal, physical and email addresses are available) on the database. The letter will include information on the appeal period, as well as details regarding where to obtain a copy of the EA;
- A copy of the EA will be uploaded to the project website (i.e. <http://www.csir.co.za/eia/ScatecSolarPV/>); and
- All I&APs on the project database will be notified of the outcome of the appeal period in writing.

8.4 Authority Consultation during the EIA Phase

Authority consultation is integrated into the PPP, with additional one-on-one meetings held with the lead authorities, where necessary. It is proposed that the Competent Authority (DEA) as well as other lead authorities will be consulted at various stages during the EIA Process. At this stage, the following authorities have been identified for the purpose of this EIA Process (additional authorities might be added to this list as the EIA Process proceeds):

- National DEA;
- Department of Environment and Nature Conservation of the Northern Cape Province;
- DWS of the Northern Cape Province;
- Department of Energy of the Northern Cape Province;
- Department of Mineral Resources of the Northern Cape Province;
- Eskom Holdings SOC Ltd;
- Transnet SOC Ltd;
- South African National Parks;
- Department of Social Development;
- National Energy Regulator of South Africa;
- National DAFF;
- DAFF of the Northern Cape Province;
- Department of Agriculture, Land Reform & Rural Development of the Northern Cape Province;
- Department of Public Works, Roads and Transport of the Northern Cape Province;

- Department of Labour;
- SKA;
- SAHRA;
- Ngwao Boswa Kapa Bokoni (Heritage Northern Cape);
- South African Civilian Aviation Authority;
- South African National Road Agency Limited;
- ZF Mgcawu District Municipality;
- Kai! Garib Local Municipality; and
- !Kheis Local Municipality.

The authority consultation process for the EIA Phase is outlined in Table 8.2 below.

Table 8.2: Authority Communication Schedule

STAGE IN EIA PHASE	FORM OF CONSULTATION
During the EIA Process	Site visit for authorities, if required.
During preparation of EIA Reports	Communication with the DEA on the outcome of Specialist Studies.
On submission of EIA Reports for decision-making	Meetings with dedicated departments, if requested by the DEA, with jurisdiction over particular aspects of the project (e.g. Local Authority) and potentially including relevant specialists.

8.5 Approach to Impact Assessment and Specialist Studies

This section outlines the assessment methodology and legal context for specialist studies, as recommended by the DEA 2006 Guideline on Assessment of Impacts.

8.5.1 Generic TOR for the Assessment of Potential Impacts

The identification of potential impacts should include impacts that may occur during the construction, operational and decommissioning phases of the development. The assessment of impacts is to include direct, indirect as well as cumulative impacts. In order to identify potential impacts (both positive and negative) it is important that the nature of the proposed projects is well understood so that the impacts associated with the projects can be assessed. The process of identification and assessment of impacts will include:

- Determining the current environmental conditions in sufficient detail so that there is a baseline against which impacts can be identified and measured;
- Determining future changes to the environment that will occur if the activity does not proceed;
- Develop an understanding of the activity in sufficient detail to understand its consequences; and
- The identification of significant impacts which are likely to occur if the activity is undertaken.

As per the DEAT Guideline 5: Assessment of Alternatives and Impacts the following methodology is to be applied to the predication and assessment of impacts. Potential impacts should be rated in terms of the direct, indirect and cumulative:

- **Direct impacts** are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.

- **Indirect impacts** of an activity are indirect or induced changes that may occur as a result of 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.
- **Cumulative impacts** are 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. The cumulative impacts will be assessed by identifying other solar energy project proposals and other applicable projects, such as construction and upgrade of electricity generation, and transmission or distribution facilities in the local area (i.e. within 20 km of the proposed Kenhardt PV 1 project) that have been approved (i.e. positive EA has been issued) or is currently underway. The proposed and existing electrical and solar developments that will be considered as part of the EIA Phase is provided in Chapter 6 of this Scoping Report.
- **Spatial extent** - The size of the area that will be affected by the impact:
 - Site specific;
 - Local (<2 km from site);
 - Regional (within 30 km of site);
 - National; or
 - International (e.g. Greenhouse Gas emissions or migrant birds).
- **Intensity** - The anticipated severity of the impact:
 - High (severe alteration of natural systems, patterns or processes);
 - Medium (notable alteration of natural systems, patterns or processes); or
 - Low (negligible alteration of natural systems, patterns or processes).
- **Duration** - The timeframe during which the impact will be experienced:
 - Temporary (less than 1 year);
 - Short term (1 to 6 years);
 - Medium term (6 to 15 years);
 - Long term (the impact will cease after the operational life of the activity); or
 - Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient).
- **Reversibility of the Impacts** - the extent to which the impacts are reversible assuming that the project has reached the end of its life cycle (decommissioning phase) will be
 - High reversibility of impacts (impact is highly reversible at end of project life);
 - Moderate reversibility of impacts;
 - Low reversibility of impacts; or
 - Impacts are non-reversible (impact is permanent).
- **Irreplaceability of Resource Loss caused by impacts** - the degree to which the impact causes irreplaceable loss of resources assuming that the project has reached the end of its life cycle (decommissioning phase) will be:
 - High irreplaceability of resources (project will destroy unique resources that cannot be replaced);
 - Moderate irreplaceability of resources;
 - Low irreplaceability of resources; or
 - Resources are replaceable (the affected resource is easy to replace/rehabilitate).

Using the criteria above, the impacts will further be assessed in terms of the following:

- **Probability** -The probability of the impact occurring:
 - Improbable (little or no chance of occurring);
 - Probable (<50% chance of occurring);
 - Highly probable (50 - 90% chance of occurring); or
 - Definite (>90% chance of occurring).

- **Significance** - Will the impact cause a notable alteration of the environment?
 - Low to very low (the impact may result in minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making);
 - Medium (the impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated); or
 - High (the impacts will result in major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making).
- **Status** - Whether the impact on the overall environment will be:
 - Positive - environment overall will benefit from the impact;
 - Negative - environment overall will be adversely affected by the impact; or
 - Neutral - environment overall not be affected.
- **Confidence** - The degree of confidence in predictions based on available information and specialist knowledge:
 - Low;
 - Medium; or
 - High.

Impacts will then be collated into the EMPr and these will include the following:

- Quantifiable standards for measuring and monitoring mitigatory measures and enhancements will be set. This will include a programme for monitoring and reviewing the recommendations to ensure their ongoing effectiveness.
- Identifying negative impacts and prescribing mitigation measures to avoid or reduce negative impacts. Where no mitigatory measures are possible this will be stated.
- Positive impacts will be identified and augmentation measures will be identified to potentially enhance positive impacts where possible.

Other aspects to be taken into consideration in the assessment of impact significance are:

- Impacts will be evaluated for the construction and operation phases of the development. The assessment of impacts for the decommissioning phase will be brief, as there is limited understanding at this stage of what this might entail. The relevant rehabilitation guidelines and legal requirements applicable at the time will need to be applied;
- Impacts will be evaluated with and without mitigation in order to determine the effectiveness of mitigation measures on reducing the significance of a particular impact;
- The impact evaluation will, where possible, take into consideration the cumulative effects associated with this and other facilities/projects which are either developed or in the process of being developed in the local area; and
- The impact assessment will attempt to quantify the magnitude of potential impacts (direct and cumulative effects) and outline the rationale used. Where appropriate, national standards are to be used as a measure of the level of impact.

Table 8.3 is to be used by specialists for the rating of impacts.

Table 8.3: Example of Table for Assessment of Impacts

Nature of impact	Spatial Extent	Duration	Intensity	Probability	Reversibility	Irreplaceability	Mitigation Measures	Significance and Status		Confidence Level
								Without Mitigation	With Mitigation	
CONSTRUCTION PHASE (EXAMPLE)										
Scenario 1: Vegetation loss during construction										
Loss of vegetation during the construction of internal roads and on-site substation.	Local, i.e. less than 2 km from PV Solar Energy Facility	Long term, i.e. the impact will cease after the operational life span of the project	High, since there will be severe alteration of the natural system	Highly probable, since construction of the infrastructure cannot progress if vegetation is not cleared.	Moderate	High	Demarcate the construction footprint with hazard tape and ensure workers stay within this area, wherever practical. Educate workers on the need to stay on paths and established tracks wherever practical.	Medium (Negative Impact)	Low (Negative Impact)	High, since the prediction is made on available information

8.6 Issues to be addressed in the Specialist Studies

The issues that will be addressed in the specialist studies/input are included in Chapter 6 of this Scoping Report, however they have been summarised below in Table 8.4 for ease of reference.

Table 8.4: Summary of Issues to be addressed during the EIA Phase as part of the specialist studies/input

Specialist Study/Input	Issues to be addressed
Ecological Impact Assessment (including Terrestrial Ecology, Aquatic Ecology and Avifauna)	<p><u>Terrestrial Ecology Impacts - Construction Phase:</u></p> <ul style="list-style-type: none"> ▪ Ousting of fauna through increased anthropogenic activities, disturbance of refugia (location of an isolated population that was widespread in the past) and general change in habitat. ▪ Increased electrical light pollution leading to changes in nocturnal behavioural patterns amongst fauna. ▪ Exclusion (or entrapment) of in particular, larger fauna on account of the fencing of the site. ▪ Changes in edaphics (soils) on account of excavation and import of material, leading to alteration of plant communities and fossorial species in and around these points. <p><u>Aquatic Ecology Impacts - Construction Phase:</u></p> <ul style="list-style-type: none"> ▪ Alteration in surface drainage patterns on account of construction activities leading to rapid change in plant communities and general habitat structure both within the site and immediately adjacent to site. ▪ Alteration of surface water quality on account of construction activities that lead to changes in water chemistry (e.g. use of concrete, increased hydrocarbon input, increased sediment within run off etc. alter various chemical parameters). ▪ Depending upon the origin of water (import or through abstraction of groundwater) changes in sub-surface water resources may arise, particularly in the case of the latter. <p><u>Terrestrial Ecology Impacts - Operational Phase:</u></p> <ul style="list-style-type: none"> ▪ Alteration of ecological processes on account of the exclusion of certain species inherent to the functional state of land within the PV facility i.e. larger fossorial species and predators will be excluded from the PV facility site by virtue of its fencing, generally leading to possible variations in populations of other species that remain within the site, with concomitant ecological change. ▪ Increased shading of vegetation as a consequence of the PV arrays, will lead to changes in plant water relations and possible changes in plant community structures within the site. ▪ Changes in meteorological factors at a localised scale on account of the PV facility is likely to arise (e.g. subtle changes in wind dynamics, “heat bubbles”, as well as alteration in run off of surface water and evapo-transpiration states), leading to long term, but generally latent changes in habitat. ▪ The fencing of the site, possibly with electric fencing, is likely to impact upon faunal behaviour, leading to the exclusion of certain species and possible mortalities. Alternatively, such changes may also favour some specific individuals, particularly those that remain within the confines of the proposed PV

Specialist Study/Input	Issues to be addressed
	<p>facility, which is likely to lead to further localised alteration in habitat and ecological processes within the facility.</p> <p><u>Aquatic Ecology Impacts - Operational Phase:</u></p> <ul style="list-style-type: none"> ▪ Abstraction of ground water for the cleaning of modules will alter the state of sub-surface water resources, depending upon nature and origin of such water. ▪ Overhead transmission lines, as well as subtle changes in habitat are likely to result in the alteration of avian behaviour in and around the site (which will be assessed as part of the BA Processes).
Visual Impact Assessment	<p><u>Construction and Decommissioning Phases:</u></p> <p>It is likely that all or most components of the proposed facilities will potentially contribute to visual impact during the construction and decommissioning phases. A very large area will be cleared of vegetation to host solar fields and associated buildings and structures. Laydown areas for equipment will also be required although these will be temporary, and will be rehabilitated with endemic vegetation after construction and decommissioning phases. An increase in human activity in a remote area is likely to be noticed even by only a small number of visual receptors. Relatively large construction equipment and vehicles will be operating during these phases of development, and an increase in traffic on roads in the region is likely. Buried pipelines and cables will not be visible during the operational phase, but activity, equipment and soil heaps will be visible during construction. Construction or improvement of access roads will be more visible than the operational roads. All of these potential visual impacts will affect receptors for a relatively short period.</p> <p>The following issues and impacts will be addressed in the Visual Impact Assessment:</p> <ul style="list-style-type: none"> ▪ Potential visual intrusion of construction activities on the existing views of sensitive visual receptors in the rural landscape; ▪ Potential visual intrusion of a large area cleared of vegetation on the existing views of sensitive visual receptors; and ▪ Potential visual impact of night lighting during the construction phase on the nightscape of the region. <p><u>Operational Phase:</u></p> <p>Elements of the project that will potentially cause significant visual impact during the operational phase include:</p> <ul style="list-style-type: none"> ▪ Solar field - The solar field is likely to contrast strongly with surrounding or background vegetation. ▪ Inverter stations (4 m) and operations buildings (5 m); ▪ On-site Substation (30 m) can potentially extend above the skyline for most visual receptors in the surrounding area; and ▪ Security fencing (3 m) and guard cabin (3 m). From some viewing angles the fence is more visible than the panels. <p>The following issues and impacts will be addressed in the Visual Impact Assessment:</p>

Specialist Study/Input	Issues to be addressed
	<ul style="list-style-type: none"> ▪ Potential landscape impact of introducing a large solar plant into a remote rural landscape; ▪ Potential visual intrusion of a large solar field on the existing views of sensitive visual receptors; ▪ Potential visual intrusion of tall, relatively large structures on the existing views of sensitive visual receptors; and ▪ Potential impact of night lighting of the development on the relatively dark rural nightscape.
Heritage Impact Assessment (Archaeology and Cultural Landscape)	<p><u>Construction and Operational Phases:</u></p> <ul style="list-style-type: none"> ▪ Direct disturbance and/or destruction of archaeological material; ▪ Direct impacts to the landscape through introduction of industrial type facilities; and ▪ Direct disturbance and/or destruction of possible graves (although unlikely).
Desktop Palaeontological Impact Assessment	<p><u>Construction Phase:</u></p> <ul style="list-style-type: none"> ▪ Potential damage to or destruction of fossil heritage at or near the surface within the study area.
Geohydrological Assessment	<p><u>Construction and Operational Phases:</u></p> <ul style="list-style-type: none"> ▪ Limited groundwater availability in the region; ▪ Water quality of the existing boreholes present within the study area; and ▪ Borehole yields of existing boreholes that are present within the study area.
Soils and Agricultural Potential Assessment	<p><u>Operational Phase:</u></p> <ul style="list-style-type: none"> ▪ Economic consequences of the proposed project at local/regional scale due to the modification/loss of agricultural potential on the site; and ▪ Whether soil conditions will be transformed and agricultural soil resources will be damaged or lost.
Social Impact Assessment	<p><u>Construction and Operational Phases:</u></p> <ul style="list-style-type: none"> ▪ Influx of jobseekers; ▪ Increased competition for urban-based employment; ▪ Increases in social deviance; ▪ Increases in incidence of HIV/AIDS infections; ▪ Expectations regarding jobs; ▪ Local spending; ▪ Local employment; and ▪ Job losses at the end of the project life-cycle.
Traffic Impact Statement	<ul style="list-style-type: none"> ▪ Road maintenance requirements ▪ Traffic generation ▪ Speed limits ▪ Permitting requirements

8.7 Alternatives to be assessed in the EIA Phase

A description of the alternatives that will be assessed or considered during the EIA Phase is provided in Chapter 5 of this Scoping Report. However, they have been summarised below for ease of reference:

- **No-go Alternative:**
 - The no-go alternative assumes that the proposed project will not go ahead i.e. it is the option of not constructing the proposed Kenhardt PV 1 facility. This alternative would result in no environmental impacts on the site or surrounding local area, as a result of the facility. It will provide a baseline against which other alternatives will be compared and considered during the EIA Phase.
- **Land Use Alternative:**
 - No other renewable energy technologies were deemed to be appropriate for the site and therefore these technologies will not be further assessed during the EIA Phase. The implementation of a solar energy facility at the proposed project site is more favourable than other alternative energy facilities due to the following:
 - The solar resources available across the proposed project site are better and represent a higher yield than the biomass, hydro or wind resources available across the same site;
 - Wind energy facilities require that wind turbines are spaced a significant distance from one another. The implementation of a wind energy facility would not make optimum use of the land which is available; and
 - The proposed solar facility currently falls within the REDZ 7 which has been identified by the DEA SEA as being of strategic importance for Solar PV development (as discussed in Chapter 1 and Chapter 2 of this Scoping Report).
- **Location Alternatives within the Selected Site:**
 - The selection of the site (i.e. the Remaining Extent of the Onder Rugzeer Farm 168) is described in Chapter 5 of this Scoping Report. During the EIA Phase, the preferred layout within the preferred Kenhardt PV 1 site will be determined.
 - The available development areas of each of the above locations exceed 250 ha, which is the approximate area required for each solar PV project.
- **Technology Alternatives:**
 - Applicable and relevant technology options will be described during the EIA Phase, such as those relating to the mounting system.
- **Layout Alternatives:**
 - Layout alternatives for the project will be determined following the input from the various specialists. The studies will aim to identify various environmental sensitivities present on the preferred site that should be avoided, which will be taken into account during the determination of the proposed layout of the PV facility.
 - The use of the existing Transnet Service Road or the unnamed farm road will also be discussed during the EIA Phase.

It is important to note that where alternatives are not feasible or will not be assessed, a motivation has been provided in Chapter 5 of this Scoping Report. The preferred alternatives will be assessed during the EIA Phase.

8.8 TOR for the Specialist Studies

The TOR for the specialist studies will essentially consist of the generic assessment requirements and the specific issues identified for each discipline. The TOR will be updated to include relevant comments received from I&APs and authorities during the 30-day review of the Scoping Reports.

The following specialist studies have been identified based on the issues identified to date, as well as potential impacts associated with the project. The TOR for each specialist study is discussed in detail below. The specialist studies and associated specialists are shown in Table 8.5 below. Additional specialist studies could possibly be commissioned as a result of issues raised during the Scoping Process.

Table 8.5: Specialist Studies and Associates Specialists

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN
Simon Bundy	Sustainable Development Projects cc	Ecological Impact Assessment (including Terrestrial Ecology, Aquatic Ecology and Avifauna)
Henry Holland	Private	Visual Impact Assessment
Dr. Jayson Orton	ASHA Consulting (Pty) Ltd	Heritage Impact Assessment (Archaeology and Cultural Landscape)
Dr. John Almond	Natura Viva cc	Desktop Palaeontological Impact Assessment
Julian Conrad	GEOSS	Geohydrological Assessment
Johann Lanz	Private	Soils and Agricultural Potential Assessment
Rudolph du Toit	CSIR	Social Impact Assessment

As explained in Chapter 6 of this Scoping Report, it is important to note at the outset that cumulative impacts will be assessed in the specialist studies (as applicable) by identifying other solar energy project proposals and other applicable projects, such as construction and upgrade of electricity generation, transmission or distribution facilities in the local area (i.e. within 20 km of the proposed Kenhardt PV projects) that have been approved (i.e. positive EA has been issued) or the EIA is currently underway. The cumulative impacts will be assessed in terms of each proposed Kenhardt PV project as well.

As noted in Chapter 4 and Chapter 6 of this Scoping Report, technical studies will also be undertaken to inform the potential impact that the proposed project will have on the SKA project and to determine suitable mitigation measures to manage the risk (if any) posed to the SKA project by the development of this project. These studies will be added as an appendix to the EIA Report. It is anticipated that the mitigation measures will be negligible in terms of impacts to the environment and will only be applicable to the design of the facility.

8.8.1 Ecological Impact Assessment (including Terrestrial Ecology, Aquatic Ecology and Avifauna)

Chapter 6 of this Scoping Report highlights the issues that will be addressed in the Ecological Impact Assessment as part of the EIA Phase of the proposed project. Based on the issues identified, the potential impacts arising should be considered in terms of both the construction and operational phases, where the former is to be considered a short term, rapid impact of varying severity, while the latter is considered to have longer term, more subtle changes in the habitats/sites in question. Impacts are considered to be both negative and positive in nature, depending upon the approach to such issues. The possible impacts arising as a consequence of the implementation of the proposed project will be considered through the undertaking of a detailed Ecological Impact Assessment that will give due consideration to the key issues highlighted in Chapter 6, including habitat and ecological processes, as well as geohydromorphic factors. The findings of the Ecological Impact Assessment will be utilised to identify the most appropriate site for the proposed development, or any significant or fatal flaws that may arise within a particular site and the preferred layout of the project within the site.

The Ecological Impact Assessment will therefore be undertaken with the following broad TOR as follows:

- Identification of baseline ecological parameters, based upon the floral and faunal state of the preferred site;
- Consideration of ecological drivers upon the proposed sites;
- Consideration of possible changes in drivers as well as direct impacts that would arise as a consequence of the establishment of the proposed facility;
- Identification of significance of such change and integration into impact evaluation methods.
- Consideration of mitigation or avoidance measures that may be employed to obviate negative impacts that are identified in the evaluation processes; and
- Final consideration of planning and layout, as well as operations, will be undertaken to assist with the employment of the abovementioned mitigation measures.

Overall, the study will include the following tasks:

- Review detailed information relating to the project description and precisely define the environmental risks to the terrestrial and aquatic environment (including avifauna) and consequences for ecology.
- Draw on desktop information sources, the knowledge of local experts, information published in the scientific press and information derived from relevant EIAs and similar specialist studies previously conducted within the surrounding area.
- Compile a baseline description of the terrestrial and aquatic ecology (including avifauna) of the study area, and provide an overview of the entire study area in terms of ecological significance and sensitivity. The description will include the major habitat forms within the study sites, giving due consideration to terrestrial ecology (flora), terrestrial ecology (fauna) and freshwater ecosystems/wetlands. The desktop review will be undertaken using spatial data, SANBI conservation data, as well as other related information.
- Provide specific ecological data in respect of the floral, faunal and aquatic components of the site using ground-truthing methods, with an emphasis on those areas considered to be of “high” and possibly, “moderate” sensitivity (based on the desktop study).
- Based on the desktop study, undertake field work and spot sampling across the site to record relevant data and to compile an overview of the habitat under review. The field assessment will aim to confirm the nature and structure of the habitat within the study area from an ecological perspective, and it will aim to identify key ecological components within the study area and in specific, the sensitivity of the prevailing habitat, as well as the identification of any floral components worthy of consideration.
- Collate all data collected during the field work and undertake a statistical review using methodologies that allows for comparison of biological data.
- Consider wetlands (endoreic pans) and associated water resources within the site in terms of significance within the catchment, habitat value and significance and delineation of extent through preliminary on site evaluation and the use of aerial imagery interpretation (where these arise). Where affected by the proposed development (i.e. within 500 m of such systems), an application in terms of the NWA will be required.
- Undertake a faunal investigation on site based on the points identified during the preliminary aerial photographic interpretation.
- Incorporate relevant information from other specialist reports/findings if required.
- Provide a detailed terrestrial and aquatic ecological sensitivity map of the site, including mapping of disturbance and transformation on site.
- Identify and rate potential direct, indirect and cumulative impacts on the terrestrial and aquatic ecology, communities and ecological processes within the site during the construction, operation and decommissioning phases of the project. Study the cumulative impacts of the project by considering the impacts proposed solar facilities, together with the impact of the proposed project.
- Provide input to the EMPr, including mitigation and monitoring requirements to ensure that the impacts on the terrestrial and aquatic ecology are limited.
- Compile an assessment report qualifying the risks and potential impacts on terrestrial and aquatic ecology in the study area and impact evaluations.

- Determine if a WUL is required and if so, determine the requirements thereof.

It is important to note that all investigations and interpretation of results will be subject to findings during site reconnaissance, where after methods described above may vary to accommodate such findings.

8.8.2 Visual Impact Assessment

The assessment will follow guidelines for Visual Impact Assessments provided by the Provincial Government of the Western Cape (PGWC) and CSIR (Oberholzer, 2005), and the Landscape Institute of the UK (GLVIA, 2002). Land Planning guides, Spatial Development Frameworks, and IPDs and other documentation relevant to the region will be referenced as part of the study.

The overall objectives of the Visual Impact Assessment specialist study are to identify and investigate potential visual impacts associated with the development of a large solar energy facility and its infrastructure near Kenhardt in the Northern Cape. The Visual Impact Assessment will therefore need to:

- Describe, in sufficient detail, the existing landscape and visual conditions of the surrounding region to form a baseline against which impacts can be measured and compared;
- Identify potential visual impacts that may occur during construction, operational and decommissioning phases of the development, as well as future potential impacts that may occur if the plant is not developed (the “no go” option), both positive and negative impacts;
- Assess the severity and significance of the potential impacts in terms of direct, indirect and cumulative impacts;
- Provide recommendations with regards to potential monitoring programmes;
- Determine mitigation and/or management measures which could be implemented to reduce the effect of negative impacts, or enhance the effect of positive impacts, as far as possible; and
- Incorporate and address issues and concerns raised during the Scoping Phase of the EIA where they are relevant to the specialist’s area of expertise.

The Visual Impact Assessment will be undertaken in the following manner:

- Desktop Review and Analysis
 - A desktop review will be undertaken to inform the assessment process in terms of documentation (e.g. municipal and regional planning policy, spatial development frameworks, legislation, national and international examples of similar developments) and availability of data (sensitive landscapes and visual receptors, spatial data for visibility analyses and landscape assessment). It also provides a basis for evaluating the confidence levels for the overall assessment.
 - A GIS and available spatial data will be used during the desktop review to determine areas of scenic interest (Nature Reserves, sites of cultural importance, heritage sites), potential sensitive receptors (viewpoints, residences), preliminary zone of visual influence, and principal representative viewpoints.
- Field Survey
 - A field survey will be undertaken and will make use of results of the desktop analysis to provide the following:
 - Photographic record of landscape elements within the study area;
 - Photographic record of the visual baseline for views from principal viewpoints;
 - The actual zone of visual influence by determining the effect of vegetation, buildings and topography on visibility in the study area;
 - Identification of sensitive receptors (viewers and landscape elements that will be affected by the proposed development); and
 - State of the current nightscape of the region.

- Landscape Baseline
 - A Landscape Baseline will thereafter be developed and will incorporate results from the desktop review and field survey to provide a description of the existing character and condition of the landscape. Landscape character reflects various factors such as geology, topography, land cover/use and human settlements that combine in particular ways to form the landscape. These factors will be described, as well as the ways they combine to create unique landscape types within the study area. The landscape condition refers to the current state of the landscape in terms of human impact. The value attached to the landscape by local residents and other sensitive receptors will also be determined where possible.
- Visual Baseline
 - Information gathered during the field survey on the influence of vegetation and topography on the potential visibility of the development will provide a basis for determining the actual Zone of Visual Influence of the development, and the practical extents of the area for which the visibility analyses will be done. Cumulative viewsheds will be calculated for various components of the development, as well as for layouts under consideration. The viewsheds will be used to determine the potential visibility of the various sites and elements, as well as to identify and classify visual receptors (viewers and principal representative viewpoints) in terms of their sensitivity to changes in the quality of their views.
- Impact Assessment, Mitigation and Report Writing
 - Potential direct, indirect and cumulative visual impacts will be identified and assessed for the construction, operational and decommissioning phases of the project. Study the cumulative impacts of the project by considering the impacts of proposed solar facilities, together with the impact of the proposed project.
 - Compile a Visual Impact Assessment report that will focus on measures to reduce negative aspects, compensatory measures to offset negative aspects, and enhancement of positive aspects. Indicators for monitoring the efficacy of mitigation measures will be suggested (for inclusion in the EMPR).

8.8.3 Heritage Impact Assessment (Archaeology and Cultural Landscape)

The following broad TOR has been specified for the Heritage Impact Assessment (including Archaeology and Cultural Landscape) to be undertaken during the EIA Phase:

- Prepare and undertake a desktop study on the fossil heritage, archaeology, and heritage sites within the proposed project area.
- Undertake a detailed field examination of the archaeological sites and heritage features within or in the region of the development area.
- Describe the type and location of known archaeological sites and in the study area, and characterize all heritage items that may be affected by the proposed project.
- Describe the baseline environment and determine the status quo in relation to the specialist study.
- Record sites of archaeological relevance (photos, maps, aerial or satellite images, GPS coordinates, and stratigraphic columns).
- Evaluate the potential for occurrence of archaeological features within the study area.
- Identify and rate potential direct, indirect and cumulative impacts of the proposed project on the archaeological heritage for the construction, operational and decommissioning phases of the project. Study the cumulative impacts of the project by considering the impacts of proposed solar facilities, together with the impact of the proposed project.
- Compile a report providing a review of archaeological heritage within the study area based on desktop study and new data from fieldwork and analysis.

- Provide recommendations and suggestions regarding archaeological heritage management on site, including conservation measures to ensure that the impacts are limited.
- Provide input to the EMPr, including mitigation measures and monitoring requirements to ensure that the impacts on the archaeology are limited.

8.8.4 Desktop Palaeontological Impact Assessment

Based on the low palaeontological sensitivity of the area a desktop Palaeontology Impact Assessment will be conducted. The Palaeontology Impact Assessment will be used to identify possible palaeontological sites or features by making use of desktop sources. The study will assess the significance of such sites, describe the possible impact of the proposed project on these sites and provide recommendations for mitigation or monitoring measures where applicable. The desktop study will be conducted in accordance with the requirements of the NHRA.

8.8.5 Geohydrological Assessment

The following broad TOR has been specified for the Geohydrological Assessment to be undertaken during the EIA Phase:

- Conduct a desktop study and review relevant literature pertaining to the site, and project plan. Obtain borehole data from the National Groundwater Archive (NGA) and plan for the field investigation.
- Complete the field work (hydrocensus) at the sites. The hydrocensus will extend to 1 km from the outline of the property boundaries and the objectives of the field works are to:
 - Locate the NGA boreholes and complete a borehole assessment;
 - Locate boreholes not yet recorded on the NGA and complete assessments; and
 - Collect anecdotal information from the land owners in the area as well as from discussions with the DWS geohydrologists.
- Analyze all the data and assess the impacts relating to the sites. Identify and rate potential direct, indirect and cumulative impacts of the proposed project (in terms of geohydrology) for the construction, operational and decommissioning phases of the project. Study the cumulative impacts of the project by considering the impacts of proposed solar facilities, together with the impact of the proposed project.
- Compile a report providing the results and findings of the investigation, potential risks, any potential mitigation measures, monitoring requirements as well as relevant recommendations.
- Provide input to the EMPr, including mitigation measures and monitoring requirements to ensure that the impacts on the geohydrology are limited.
- The results must then be documented in a report presenting the findings of the investigation, potential risks, any potential mitigation measures, monitoring requirements as well as relevant recommendations. This will give clear guidance on the way forward with regard to the study area.

8.8.6 Soil and Agricultural Potential Assessment

The specialist study will include the following:

- Detailed assessment of soil conditions:
 - The EIA Phase assessment will include a field investigation of soils and agricultural conditions across the site. This field investigation will be aimed at ground proofing the existing land type information and understanding the specific soil and agricultural conditions and their variation on site. It will not be based on a grid spacing of test pits but will comprise a reconnaissance type of soil mapping exercise based on an assessment of surface conditions, topography, and hand augered samples in strategic places, if necessary. Such a soil investigation is considered adequate for the purposes of

this study (i.e. for the purposes of determining the impact of the proposed development on agricultural resources and productivity).

- Assessment of erosion and erosion potential on site:
 - The field investigation will involve a visual assessment of erosion and erosion potential on site, taking into account the proposed development layout.
- Assessment of the impacts of specific construction activities and layout on loss of topsoil:
 - The EIA Phase will include an assessment of the specifics of construction activities and the proposed development layout on potential loss of topsoil, and the availability of topsoil for rehabilitation.
- Assessment of specific on-site agricultural activities
 - The EIA Phase will gather more detail on agricultural activity on the site and identify any locally important soil and agricultural issues. This will be done through interviews with farmers and agricultural role players in the area.

The report will fulfil the TOR for an agricultural study as set out in the National Department of Agriculture's document, Regulations for the evaluation and review of applications pertaining to renewable energy on agricultural land, dated September 2011, with an appropriate level of detail for the agricultural suitability and soil variation on site (which may therefore be less than the standardised level of detail stipulated in the above regulations).

The above requirements together with requirements for a specialist report may be summarised as:

- Identify and assess all potential impacts (direct, indirect and cumulative) and economic consequences of the proposed development on soils and agricultural potential.
- Describe and map soil types (soil forms) and characteristics (soil depth, soil colour, limiting factors, and clay content of the top and sub soil layers).
- Map soil survey points.
- Describe the topography of the site.
- Summarise available water sources for agriculture.
- Describe historical and current land use, agricultural infrastructure, as well as possible alternative land use options.
- Describe the erosion, vegetation and degradation status of the land.
- Determine and map, if there is variation, the agricultural potential across the site.
- Determine and map the agricultural sensitivity to development across the site.
- Provide recommended mitigation measures, monitoring requirements, and rehabilitation guidelines for all identified impacts.

8.8.7 Social Impact Assessment

The Social Impact Assessment will include:

- A review of existing information, and collecting and reviewing baseline social information etc.
- Conducting interviews with key affected parties, including local communities, local landowners, key government officials (local and regional) etc.
- An identification and assessment of key social issues and potential impacts (negative and positive) associated with the construction, operational and decommissioning phases of the project.
- An identification of potential mitigation and enhancement measures.
- A specialist report which includes an assessment of the potential social impacts associated with the proposed project.
- An outline of mitigatory measures and additional management or monitoring guidelines.
- Provide input to the EMP, including mitigation and monitoring requirements to ensure that negative social impacts are limited.

8.9 Key Milestones of the EIA Process

Key Milestones activities	Proposed Timeframe
I&AP, Stakeholder and Authority Review of the Scoping Reports: 30 days	September 2015 - October 2015
Submit Scoping Reports to the DEA for Decision-making.	October 2015
Review of the Scoping Reports by the DEA (i.e. accept or refuse EA): 43 days since receipt of the Scoping Reports.	October 2015 - November 2015
I&AP, Stakeholder and Authority Review of the EIA Reports: 30 days	February 2016 - March 2016
Submit EIA Reports to the DEA for Decision-making.	April 2016
Review of the EIA Reports by the DEA (i.e. grant or refuse EA): 107 days since receipt of the EIA Reports.	April 2016 - July 2016
Next steps: 5 days for notification to applicant	

SCOPING REPORT



CHAPTER 9: References

Scoping and Environmental Impact Assessment for the Proposed Development of a 75 MW Solar Photovoltaic Facility (KENHARDT PV 1) on the remaining extent of Onder Rugzeer Farm 168, north-east of Kenhardt, Northern Cape Province

contents

9 REFERENCES

9-2



9 REFERENCES

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