

SAN SOLAR PV FACILITY AND ASSOCIATED INFRASTRUCTURE

Northern Cape Province

Scoping Report

March 2022

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PROJECT DETAILS

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Client	:	San Solar Energy Facility (Pty) Ltd
Report Revision	:	Report Commenting and review period
Date	:	March 2022

When used as a reference this report should be cited as: Savannah Environmental (2022) Scoping Report San Solar PV Facility and associated infrastructure, Northern Cape Province.

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PURPOSE OF THE SCOPING REPORT AND INVITATION TO COMMENT

San Solar Energy Facility (Pty) Ltd has appointed Savannah Environmental as the independent environmental consultant to undertake the Scoping and Environmental Impact Assessment Process for the San Solar PV Facility. The EIA process is being undertaken in accordance with the requirements of the 2014 EIA Regulations promulgated in terms of the National Environmental Management Act (NEMA; Act No. 107 of 1998). This Scoping report has been compiled in accordance with Appendix 2 of the EIA Regulations, 2014 (as amended) and consists of the following sections:

This Scoping Report describes and assesses this proposed project and consists of the following chapters:

- » **Chapter 1** provides background to the San Solar PV facility project and the environmental impact assessment.
- » **Chapter 2** provides a project description of San Solar PV facility.
- » **Chapter 3** outlines strategic regulatory and legal context for energy planning in South Africa and specifically relating to the project.
- » **Chapter 4** describes the need for and alternatives considered for the San Solar PV facility.
- » **Chapter 5** outlines the approach to undertaking the Scoping/EIA process.
- » **Chapter 6** describes the existing biophysical and social environment within and surrounding the study and development area.
- » **Chapter 7** provides an identification and evaluation of the potential issues associated with the proposed solar PV facility and associated infrastructure.
- » **Chapter 8** presents the conclusions of the scoping evaluation for the Solar PV facility.
- » **Chapter 9** describes the Plan of Study (PoS) for the EIA phase.
- » **Chapter 10** provides references used to compile the Scoping report.

The Scoping Report is available for review from Tuesday 08 March 2022 to Monday 11 April 2022 at the following locations: <https://savannahsa.com/public-documents/energy-generation/>

Please submit your comments by **Monday 11 April 2022** to:

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Comments can be made as written submission via fax, post or email.

EXECUTIVE SUMMARY

San Solar PV Facility is proposed on Remaining extent of the Farm Wincanton 472, which is located site located approximately 16km north-west of the town of Kathu in the Northern Cape Province. PV technology is proposed to be utilised for the generation of electricity, and the San Solar PV facility will have a contracted capacity of up to 100MW. The grid connection for the facility will consist of a 132kV facility substation, 132kV Eskom switching substation, to be connected via a Loop-in-Loop out (LILo) connection to the Fox-Umtu 132kV overhead power line located south-east of the site.

The infrastructure associated with the solar PV facility, including all associated infrastructure will include:
2

- » PV modules and mounting structures
- » Inverters and transformers
- » Cabling between the panels, to be laid underground where practical
- » Battery Energy Storage System (BESS)
- » Site and internal access roads (up to 8m wide)
- » Laydown area
- » Operation and maintenance buildings including a gate and security building, control centre, offices, warehouse, and workshop areas for maintenance and storage.
- » Grid connection solution including a 132kV facility substation, 132kV switching station to be connected via a Loop-in-Loop out (LILo) connection to the Fox-Umtu 132kV overhead power line located south east of the site.

The majority of potential impacts identified to be associated with the construction of San Solar PV and associated infrastructure are anticipated to be localised and restricted to the development area itself and the grid connection corridor alternative, while operation phase impacts/benefits range from local to regional. No environmental fatal flaws were identified to be associated with the development area. Areas or features of high sensitivity were identified to be avoided by the development footprint.

The potentially significant issues related to the **construction** of the San Solar PV facility include:

- 1 Biodiversity and habitat loss and impacts on flora, fauna and avifauna resulting from activities such as site clearance for installation of the facility components and associated infrastructure.
- 2 Soil erosion, loss or degradation due to site clearance and compaction for installation of the facility components and associated infrastructure and due to the construction on internal access roads.
- 3 Visual impacts on the landscape.
- 1 Social impacts, both positive and negative (job creation and business opportunities, impacts associated with construction workers in the area).

The potentially significant issues related to the **operation** of the San Solar PV facility include:

- 1 Change in land use from agriculture to energy generation.
- 2 Habitat loss due to spread of alien vegetation
- 3 Visual impacts.
- 4 Positive social and economic impacts through job creation and economic benefits.

Overall Sensitivity Considerations

The potentially sensitive areas which have been identified through the environmental scoping study are illustrated in **Figure 1**. The scoping phase sensitivity map provides an informed estimate of the sensitivity on the project site, and specifically the San Solar PV development area (indicated with the blue outline) and associated grid connection corridor indicated as hatched corridors). The detail is based on the desktop review of available baseline information for the project site, as well as the sensitivity data from specialist studies undertaken during the scoping phase, which included an avifaunal field survey. During the site and desktop survey, the affected area was investigated in sufficient detail in order to provide definitive insight into the potential for constraining factors on the site. The sensitivity map must be used as a tool by the developer to avoid any areas flagged to be of higher risk or sensitivity and inform the location/layout of the development footprint for the facility and associated infrastructure. The development footprint is the area which will be assessed further in detail in the EIA Phase, in order to provide an assessment of environmental acceptability and suitability of the facility layout of the San Solar PV Facility.

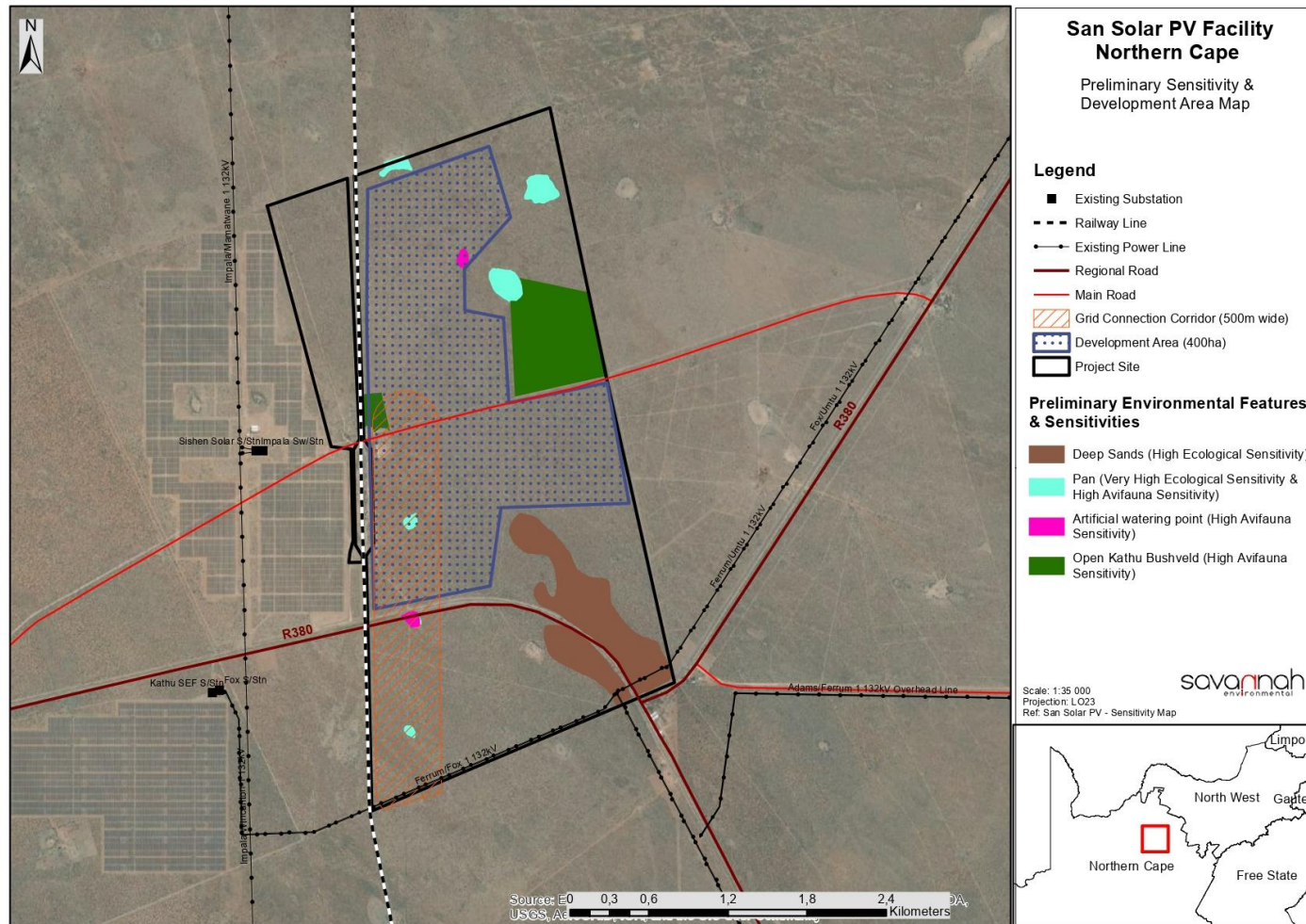


Figure 1: Environmental Sensitivity Map from the results of the scoping evaluation for the San Solar PV Facility and associated infrastructure. The sensitivity map indicates the sensitivities for the project site, as well as the San Solar PV development area (indicated with the blue outline) and the grid connection corridor alternatives (hatched corridor).

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CHAPTER 1: INTRODUCTION

The Applicant, San Solar Energy Facility (Pty) Ltd is proposing the construction of the San Solar photovoltaic (PV) facility, planned to be located on a site located approximately 16km north-west of the town of Kathu in the Northern Cape Province (refer to **Figure 1.1**). The development area falls within the jurisdiction of the Gamagara Local Municipality within the John Taolo Gaetsewe District Municipality.

The solar PV facility will comprise several arrays of PV panels and associated infrastructure and will have a contracted capacity of up to 100MW. A project site consisting of the Remaining extent of the Farm Wincanton 472 (991,5ha in extent) is being considered for the San Solar PV facility (refer to **Figure 1.1**). The full extent of the project site is evaluated in this Scoping Report to identify sensitivities. A dedicated development area for the solar PV facility (400ha in extent) will be demarcated to avoid the identified sensitivities. The grid connection for the facility will consist of a 132kV facility substation, 132kV Eskom switching substation, to be connected via a Loop-in-Loop out (LILO) connection to the Fox-Umtu 132kV overhead power line located south-east of the site.

The PV facility is planned to be located within an area previously authorised for a 75MW PV project, also known as the San Solar PV project (DEA ref no: 14/12/16/3/3/2/273 EA issued on 02 July 2013), which Environmental Authorisation lapsed in 2021. This application for Environmental Authorisation is considered on the same property.

Site-specific studies and assessments will delineate areas of potential sensitivity within the identified project site. Once constraining factors have been confirmed, the layout of the solar PV facility within a development area can be planned to avoid sensitive environmental areas and features.

From a regional perspective, the Kathu area is considered favourable for the development of a commercial solar energy facility by virtue of prevailing climatic conditions, relief, aspect, the extent of the affected property, the availability of a grid connection (i.e. a point of connection to the national grid) and the availability of land on which the development can take place.

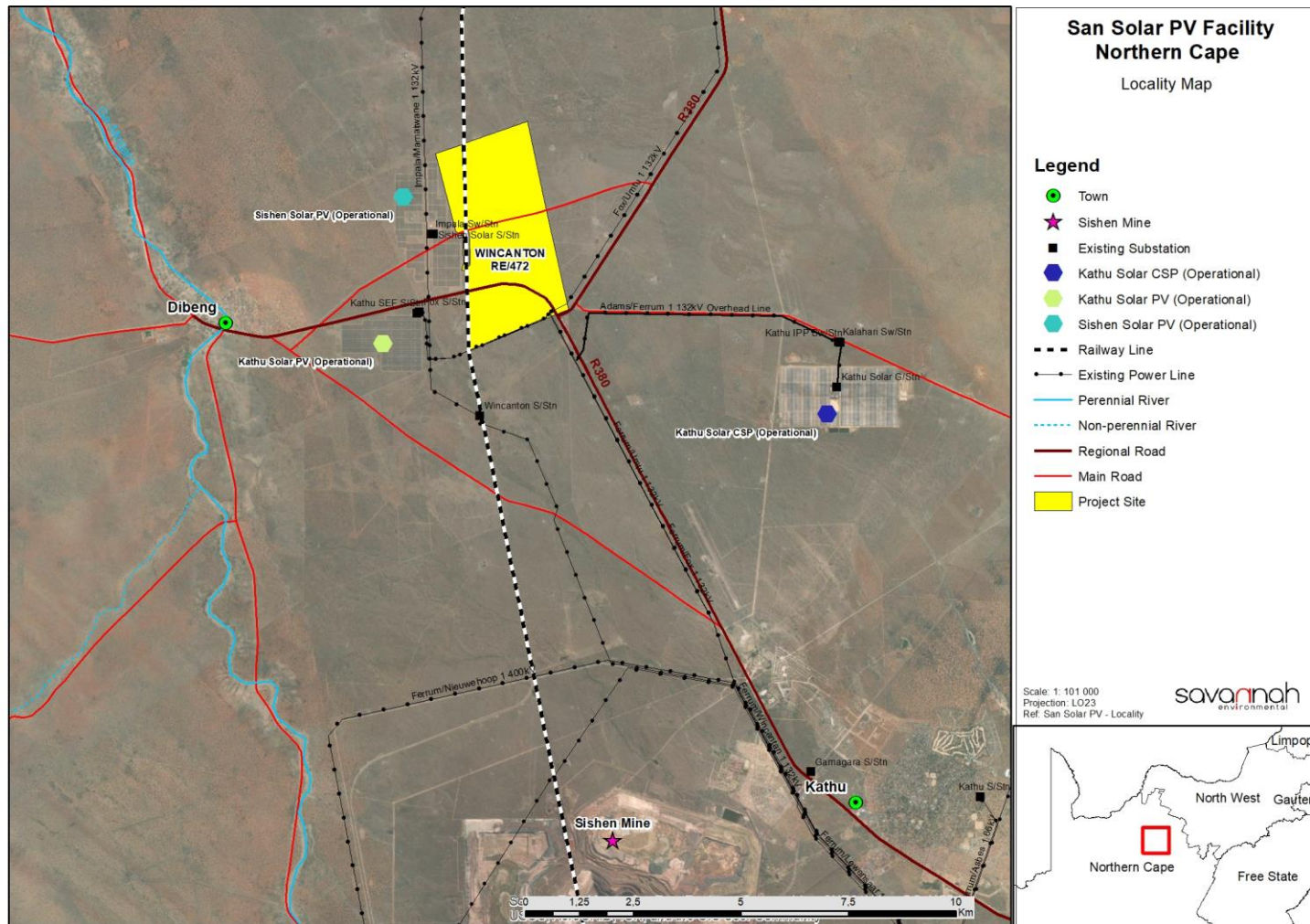


Figure 1.1: Locality map illustrating the location of the San Solar PV development (refer to **Appendix K** for A3 map).

1.1 Project Overview

The project site has been identified by the applicant as a technically feasible site which has the potential for the development of a solar PV facility, including a Battery Energy Storage System (BESS). The full extent of the project site has been considered within this Scoping Report with the aim of determining the suitability from an environmental and social perspective and identifying areas that should be avoided in development planning.

In order to evaluate the project, the following is considered through this Scoping/EIA process:

Project site	the Remaining extent of the Farm Wincanton 472 (991,5ha in extent).
Development area	that identified area (to be located within the project site) where the San Solar PV facility is planned to be positioned. This area will be selected as a practicable location option for the facility, considering technical preference and environmental constraints. The development area is ~400ha in extent, and will be demarcated as a result of the findings of the Scoping phase.
Development footprint (facility layout)	the defined area (located within the development area) where the PV panel array and other associated infrastructure for San Solar PV facility is planned to be constructed. This is the facility footprint, and the area which would be disturbed by project-related infrastructure.

Within this identified project site, a development area¹, including a footprint² or facility layout will be defined based on the findings of the Scoping Study and will be further assessed during the EIA Phase. Therefore, the exact location of the development area within the project site for the San Solar PV facility is not defined at this stage of the process. The development footprint/facility layout for the 100MW PV facility, including a BESS, and all associated infrastructure, will be confirmed in the EIA Phase once the layout design is available. The development area is larger than the area needed for the development footprint of a 100MW PV facility, and therefore provides the opportunity for the optimal placement of the infrastructure, ensuring avoidance of major identified environmental sensitivities or constraints identified through this Scoping and EIA process.

Table 1.1: A detailed description of the San Solar PV project site

Province	Northern Cape Province
District Municipality	John Taolo Gaetsewe District Municipality
Local Municipality	Gamagara Local Municipality
Ward Number (s)	Ward 7
Nearest town(s)	Kathu (~16km north-west)

¹ The development area is that identified area (located within the project site) where the San Solar PV facility is planned to be located. This area is selected as a practicable option for the facility, considering technical preference and constraints. The development area is ~400ha in extent.

² The development footprint is the defined area (located within the development area) where the PV panel array and other associated infrastructure for San Solar PV facility is planned to be constructed. This is the actual footprint of the facility, and the area which would be disturbed.

Farm name(s) and number(s) of properties affected by the Solar PV Facility	Farm Wincanton 472		
Farm Portion(s), Name(s) and Number(s) associated with the PV Facility	Remaining extent of the Farm Wincanton 472		
Farm Portion(s), Name(s) and Number(s) of properties affected by the Solar PV substation and LILO grid connection	Remaining extent of the Farm Wincanton 472		
SG 21 Digit Code (s) for all properties	C0410000000047200000		
Current zoning	Agricultural (grazing of cattle)		
Current land use	Grazing (mainly cattle)		
Extent of Project site	991,5 ha		
Development Area	~ 400ha within the project site		
Site Coordinates (project site)		Latitude:	Longitude:
	Northern point	27°33'33.73"S	22°56'35.89"E
	Eastern point	27°34'34.73"S	22°57'35.32"E
	Southern point	27°35'58.32"S	22°57'7.60"E
	Western point	27°34'43.23"S	22°56'16.95"E
	Centre point	27°34'48.99"S	22°57'2.07"E

San Solar PV will have a contracted capacity of up to 100MW and will include specific infrastructure, namely:

- » PV modules and mounting structures
- » Inverters and transformers
- » Cabling between the panels, to be laid underground where practical
- » Battery Energy Storage System (BESS)
- » Site and internal access roads (up to 8m wide)
- » Laydown area
- » Operation and maintenance buildings including a gate and security building, control centre, offices, warehouse, and workshop areas for maintenance and storage.
- » Grid connection solution including a 132kV facility substation, 132kV switching station to be connected via a Loop-in-Loop out (LILO) connection to the Fox-Umtu 132kV overhead power line located south east of the site.

The overarching objective for the San Solar PV facility is to maximise electricity production through exposure to the available solar resource, while minimising infrastructure, operational and maintenance costs, as well as potential social and environmental impacts. In order to meet these objectives, local level environmental and planning issues will be assessed through the EIA process with the aid of site-specific specialist studies in order to delineate areas of sensitivity within the identified project site; this will serve to inform and optimise the design of the solar PV facility.

1.2 Requirement for an Environmental Impact Assessment Process

Section 24 of South Africa's National Environmental Management Act (No. 107 of 1998) (NEMA) pertains to Environmental Authorisations (EA), and requires that the potential consequences for, or impacts of, listed or specified activities on the environment be considered, investigated, assessed, and reported on to the Competent Authority. The 2014 Environmental Impact Assessment (EIA) Regulations, as amended (GNR 326) published under NEMA prescribe the process to be followed when applying for Environmental Authorisation (EA), while the Listing Notices (Listing Notice 1 (GNR 327), Listing Notice 2 (GNR 325), and Listing Notice 3 (GNR 324)) contain those activities which may not commence without Environmental Authorisation from the Competent Authority.

Various aspects of San Solar PV are listed as activities that may have a detrimental impact on the environment. The primary listed activity triggered by San Solar PV is Activity 1 of Listing Notice 2 (GN R325) which relates to the development of facilities or infrastructure for the generation of electricity from a renewable resource where the generating capacity is 20MW or more. San Solar PV will have a contracted capacity of 100MW.

The San Solar PV facility requires Environmental Authorisation from the National Department of Forestry, Fisheries and the Environment (DFFE) subject to the completion of a full Scoping and Environmental Impact Assessment (S&EIA), as prescribed in Regulations 21 to 24 of the 2014 EIA Regulations (GNR 326).

In terms of GNR 779 of 01 July 2016, the DFFE has been determined as the Competent Authority for all projects which relate to the Integrated Resource Plan for Electricity (IRP) 2010 – 2030, and any updates thereto. Through the decision-making process, the DFFE will be supported by the Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAEARD&LR) as the commenting authority.

1.3 Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of an Impact Assessment Report

This Scoping Report has been prepared in accordance with the requirements of the EIA Regulations published on 08 December 2014 (as amended) promulgated in terms of Chapter 5 of the National Environmental Management Act (Act No 107 of 1998). This chapter of the Scoping Report includes the following information required in terms of Appendix 2: Content of Scoping Report:

Requirement	Relevant Section
(a)(i) the details of the EAP who prepared the report and (ii) the expertise of the EAP to carry out scoping procedures; including a curriculum vitae	The details of the EAP have been who prepared the report is included in Section 1.5 . The Curriculum vitae of the Savannah Environmental team has been included as Appendix A .
(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 and (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties	The location of the San Solar PV facility has been included under Section 1.1 and within Table 1.1 .
(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	A locality map illustrating the location of the San Solar PV facility has been included as Figure 1.1 in this chapter.

been defined, the coordinates within which the activity is to be undertaken

This Scoping Report consists of ten chapters, which include:

- » **Chapter 1** provides background to the San Solar PV facility project and the environmental impact assessment.
- » **Chapter 2** provides a project description of San Solar PV facility.
- » **Chapter 3** outlines strategic regulatory and legal context for energy planning in South Africa and specifically relating to the project.
- » **Chapter 4** describes the need for and alternatives considered for the San Solar PV facility.
- » **Chapter 5** outlines the approach to undertaking the Scoping/EIA process.
- » **Chapter 6** describes the existing biophysical and social environment within and surrounding the study and development area.
- » **Chapter 7** provides an identification and evaluation of the potential issues associated with the proposed solar PV facility and associated infrastructure.
- » **Chapter 8** presents the conclusions of the scoping evaluation for the Solar PV facility.
- » **Chapter 9** describes the Plan of Study (PoS) for the EIA phase.
- » **Chapter 10** provides references used to compile the Scoping report.

1.4 Overview of this Environmental Impact Assessment (EIA) Process

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

The EIA process comprises of two (2) phases (i.e. Scoping and Impact Assessment) and involves the identification and assessment of potential environmental impacts through the undertaking of independent specialist studies, as well as public participation. The processes followed in these two phases is as follows:

The **Scoping Phase** includes the identification of potential issues associated with the project through a desktop study (considering existing information) and consultation with affected parties and key stakeholders. This phase considers the broader project site in order to identify and delineate any environmental fatal flaws, no-go and / or sensitive areas. Following a public review period of the Scoping report, this phase culminates in the submission of a final Scoping Report and Plan of Study for the EIA to the Competent Authority for consideration and acceptance.

The **EIA Phase** involves a detailed assessment of the potentially significant positive and negative impacts (direct, indirect, and cumulative) identified in the Scoping Phase. This phase considers a proposed development footprint within the project site and includes detailed specialist investigations as well as public consultation. Following a public review period of the EIA Report, this phase culminates in the submission of a final EIA Report and an Environmental Management Programme (EMPr), including recommendations of practical and achievable mitigation and management measures, to the Competent Authority for final review and decision-making.

1.5 Appointment of an Independent Environmental Assessment Practitioner (EAP)

In accordance with Regulation 12 of the 2014 EIA Regulations (GNR 326), the applicant has appointed Savannah Environmental (Pty) Ltd as the independent environmental consultant responsible for managing the Application for Environmental Authorisation (EA) and supporting Scoping and Environmental Impact Assessment (S&EIA) process; inclusive of comprehensive, independent specialist studies. The application for EA and S&EIA process will be managed in accordance with the requirements of NEMA, the 2014 EIA Regulations (GNR 326), and all other relevant applicable legislation.

Neither Savannah Environmental nor any of its specialists are subsidiaries of or are affiliated to the applicant. Furthermore, Savannah Environmental does not have any interests in secondary developments that may arise out of the authorisation of the proposed facility.

Savannah Environmental is a leading provider of integrated environmental and social consulting, advisory and management services with considerable experience in the fields of environmental assessment and management. The company is wholly woman-owned (51% black woman-owned) and is rated as a Level 2 Broad-based Black Economic Empowerment (B-BBEE) Contributor. Savannah Environmental's team have been actively involved in undertaking environmental studies since 2006, for a wide variety of projects throughout South Africa, including those associated with electricity generation and infrastructure development.

The Savannah Environmental team for this project includes:

- » **Rendani Rasivhetshele** is the principle author of this report. She is a registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA), and she holds a Bachelor of Science Honours in Environmental Management. She has experience in conducting Environmental Impacts Assessments, public participation, and Environmental Management Programmes for a wide range of projects, including renewable energy projects. She is responsible for overall compilation of the report, this includes specialist engagement, reviewing specialists reports and incorporating specialist studies into the Environmental Impact Assessment report and its associated Environmental Management Programme.
- » **Karen Jodas** holds a Master of Science Degree from Rhodes University and is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP). She has gained extensive knowledge and experience on potential environmental impacts associated with electricity generation and transmission projects through her involvement in related EIA processes over the past 20 years. She has successfully managed and undertaken EIA processes for infrastructure development projects throughout South Africa.
- » **Lehlogonolo Mashego**, responsible for the Public Participation Process on this project, holds a MSc in Environmental Science as obtained from the University of Witwatersrand. She is a Gauteng Branch Committee Member for IAIA's facilitating the students and young professionals' division. She has 5 years of professional working experience in the public participation field; specialising in overall public facilitation, stakeholder engagement, public awareness, stakeholder liaison and project administration. She is responsible for project management of public involvement participation processes for a wide range of projects across South Africa in industries which include but not limited to mining, renewable energy, infrastructure and recreation. Through her role as an environmental practitioner, she has facilitated a range of Screening Assessments, Basic Assessments, Scoping and Environmental Impact Assessments, Environmental Auditing and Environmental Training.

Curricula Vitae (CVs) detailing Savannah Environmental team's expertise and relevant experience are provided in **Appendix A**.

1.6 Details of the Independent Specialist Team

In order to adequately identify and assess potential impacts associated with the project, a number of specialists have been appointed as part of the project team and have provided specialist input into this Scoping Report (refer to **Table 1.2**). CVs detailing the independent specialists' expertise and relevant experience are provided in **Appendix A**.

Table 1.2: Independent Specialists that contributed to the Scoping Report

Company	Specialist Area of Expertise	Specialist Name
3Foxes Biodiversity Solutions	Ecology	Simon Todd
Pachnoda Consulting	Avifauna	Lukas Niemand
Terra Africa Environmental Consultants	Soils and Agricultural Potential	Marinè Pienaar
LOGIS	Visual	Lourens du Plessis
CTS Heritage	Heritage and Palaeontology	Jenna Lavin
Savannah Environmental and Tony Barbour Consulting	Social environment	Nondumiso Bulunga and Tony Barbour

CHAPTER 2 PROJECT DESCRIPTION

This Chapter provides a description of the San Solar PV facility and associated infrastructure proposed for development. It must be noted that the project description presented in this Chapter may change to some extent based on the outcomes and recommendations of detailed engineering and other technical studies, the findings and recommendations of the EIA and supporting specialist studies, and any licencing, permitting, and legislative requirements.

2.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of an Impact Assessment Report

This chapter of the Scoping Report includes the following information required in terms of Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
(d)(ii) a description of the activities to be undertaken including associated structures and infrastructure	A description of the associated infrastructure is included in Section 2.4 . Activities to be undertaken during the various project development phases is included in Section 2.6 .
(g)(ix) the outcome of the site selection matrix	Section 2.3 includes a description of the selection of the project site.

2.2 Project and Site Description

A project site has been identified for the development of San Solar PV facility. The project site is located on the Farm Remaining extent of the Farm Wincanton 472, approximately 16km north-west of the town Kathu, within ward 1 of the Gamagara Local Municipality with the John Taolo Gaetsewe District Municipality in the Northern Cape Province. The total extent of the affected property is 991,5ha ha, within which a dedicated development area³ for the solar PV facility (400ha in extent) will be demarcated to avoid the identified sensitivities.

The project site was previously authorised for the development of a 75MW PV project, also known as the San Solar PV project. This application for Environmental Authorisation is considered on the same property which contributes to the selection of the project site for the development of a solar PV energy facility.

The Applicant is the owner of the property/project site. The property has been owned since 2015, and the current land use is grazing (through a lease with a third party). The site is also adjacent to other solar PV facilities, collectively forming a renewable energy node in this area north of Kathu. Three (3) solar facilities have been constructed in the broader area. These include the Sishen Solar PV and Kathu Solar PV facilities located immediately west of the farm Remaining extent of the Farm Wincanton 472. The Kathu Solar facility is a CSP facility located to the east of the study area.

³ The development area is that identified area (located within the project site) where the San Solar PV facility is planned to be located. This area is selected as a practicable option for the facility, considering technical preference and environmental constraints. The development area will be ~400ha in extent.

The project site can be accessed via the R380 provincial route which branches off the N14 National Road, to the south of Kathu town. Infrastructure closer to the proposed San Solar PV facility includes the Kathu Solar PV, Kathu Solar Energy Facility (SEF) and the Sishen Solar PV facilities.

In spite of the predominantly rural and natural character of the study area, there are a large number of overhead power lines in the study area, associated mainly with the Ferrum Substation located at the mine. These include:

- » Ferrum-Wincanton 1 132kV
- » Ferrum-Fox 1 132kV
- » Adams-Ferrum 1 132kV
- » Fox-Umtu 1 132kV
- » Impala-Mamatwane 1 132

The grid will comprise of a 132kV Switching Station, 132kV facility station to be connected via a Loop-In Loop-Out (LILO) to the Fox-Umtu 132kV overhead power line located south east of the site. A grid connection corridor (approximately 500m in width) run down the length of the eastern boundary of the property, enabling a LILO connection to the Fox-Umtu 132kV grid line.

The full extent of the project site has been considered within this Scoping Report with the aim of determining the suitability from an environmental and social perspective and identifying areas that should be avoided in development planning. Site-specific studies and assessments will delineate areas of potential sensitivity within the project area. Once constraining factors have been mapped, the layout of the solar PV facility within a development area can be planned to avoid sensitive environmental areas and features. Within this identified development area, a development footprint⁴ or facility layout will be defined based on the findings of the Scoping study and will be further assessed during the EIA Phase.

The San Solar PV facility is planned to be located within an area previously authorised for a 75MW PV project, also known as the San Solar PV project (DEA ref no: 14/12/16/3/3/2/273, EA issued on 02 July 2013), which Environmental Authorisation lapsed in 2021. This application for Environmental Authorisation is considered on the same property.

From a technical perspective, the Kathu area is considered favourable for the development of commercial solar energy facilities by virtue of the prevailing climatic conditions, relief and aspect, the extent of the project site and development area, the availability of a direct grid connection (i.e. point of connection to the national Eskom grid), and the availability of land on which development can take place.

The type of technology selected for implementation, will be based on the outcomes of the EIA process, and the completion of additional technical studies (e.g. geotechnical and other surveys) to be conducted as part of the detailed design phase and will ultimately influence the final project layout and development footprint. The extent of the project site under investigation allows for layout design and site-specific alternatives to be identified considering the environmental sensitivities present.

⁴ The development footprint is the defined area (located within the development area) where the PV panel array and other associated infrastructure for San Solar PV facility is planned to be constructed. This is the actual footprint of the facility, and the area which would be disturbed.

Table 2.1 provides the details of San Solar PV facility, including the main infrastructure components and services that will be required during the project life cycle.

Table 2.1: Details of San Solar PV facility and associated infrastructure. Specific details to be confirmed in the EIA Phase

Component	Description / Dimensions
Project site - Total extent of the affected property	~991,5ha
Total extent of the Development area	~400ha
Contracted capacity of the facility	100MW
Technology	Solar PV Monofacial or Bifacial PV panels, mounted on either fixed-tilt, single-axis tracking, and/or double-axis tracking systems
PV panels	Height: ~2.5m from ground level (installed). PV field approximately 250ha in extent
Battery Energy Storage System (BESS)	The area will be determined in the EIA phase
Facility Substation	» Facility substation with a 132kV capacity
Eskom Switching Substation	» Eskom switching substation with a 132kV capacity
Grid Connection	» 132kV grid connection LILO » Double Circuit line <2km in length » grid connection corridor (approximately 500m in width) run down the length of the western boundary of the property, enabling a LILO connection to the Fox-Umtu 132kV grid line
Site and internal access	Access to the project site will be via the R380 regional road. An 8m wide main gravel/hard surfaced access road will be constructed to provide direct access to the development area. A network of gravel internal access roads, each with a width of 5m will be constructed to provide access to the various components of the San Solar PV facility development.
Temporary laydown area	» 100m x 100m
Other infrastructure	» Operations and Maintenance buildings » Gate house » Security building » Control centre » Office buildings » Warehouse » Workshop » Visitor's centre

Services required

Refuse material disposal - all generated refuse material will be collected by a private contractor and will be disposed of at a licensed waste disposal site off site. This service will be arranged with the municipality when required.

Sanitation – All sewage/effluent water will be managed utilising temporary portable chemical toilets. Any other effluent discharge during construction will be stored in sealed containers/tanks and collected (honey-sucker) and treated by a service provider (the LM/ Contractor) at an approved facility off site. These facilities will be maintained and serviced regularly by an appropriate waste contractor.

Water supply – construction water will be sourced from the Gamagara Local Municipality (by tanker)

2.3 Summary of Site Selection Process

The broader study area (i.e. the greater Kathu area) was identified by the applicant as having the potential to support a 100MW PV facility on the basis of key technical criteria being met, including the solar resource, accessibility of the site, accessibility to the Eskom grid, and local site topography. The Northern Cape has the Global Horizon Irradiation (GHI) of approximately 2240 kWh/m²/annum, and is highly favourable for the development of a solar farm.

Other factors contributing to the selection of the site:

1. The project site was previously authorised for the development of a 75MW PV project (EA has since lapsed).
2. The Applicant is the owner of the property/project site. The property has been owned since 2015.
3. The current land use is grazing (through a lease with a third party) and there is compatibility with planned land use.
4. The site is adjacent to three other solar PV facilities, collectively forming a renewable energy node in this area north of Kathu. These include the Sishen Solar PV and Kathu Solar PV facilities located immediately west of the farm Remaining extent of the Farm Wincanton 472. The Kathu Solar facility is a CSP facility located to the east of the study area

The detail regarding site-specific characteristics which aided in the selection of the site is provided below:

Project site extent, conditions and land availability: Availability of relatively level land of sufficient extent can be a restraining factor to PV development, as a 100 MW solar PV development and associated infrastructure requires sufficient land space.

The following are key considerations in this regard:

- » The project site and development area conditions are optimal for a development of this nature, with the site being of a suitable gradient for the development of a PV facility.
- » The development area, within which the project development footprint will be located, is ~ 400ha, which is less than half of the total extent of the property (being 991.5ha). This 400ha area is considered to be sufficient for the planned 100MW PV facility and provides an opportunity for the avoidance of sensitive environmental features and areas.
- » The region within which the project site is located can be described as plains and elevations range from 1, 105m in the north-west to 1,195m in the south-east. The project site has a very even (flat) slope with slope from the south-east to the north-west. The site itself is located at an average elevation of 1,143m above sea level.

Site access: The area in which the project site is located can be accessed via the R380 provincial route which branches off the N14 National Road. Within the facility development area itself, access will be required from new / existing roads for construction purposes (and limited access for maintenance during operation). The final layout will be determined following the identification of site related sensitivities.

Land use considerations: The majority of land in the Kathu area is agriculture and land reserved for related mining activities. The Remaining extent of the Farm Wincanton 472 is owned by the applicant and has

sufficient space available for solar PV development. Within the proposed San Solar PV facility project site, there is no cultivated agricultural land, and the land is currently used for livestock grazing.

Grid connection considerations: Ease of access into the Eskom national electricity grid is vital to the viability of a solar energy facility and addresses Eskom's concerns for lower cost connection alternatives given current funding constraints. San Solar PV facility is intended to connect to the National Grid via a loop-in and loop out (LILLO) to the Fox – Umtu 132kV overhead powerline located south east of the site. Having a grid connection point in close proximity to the project site reduces the necessary grid infrastructure and therefore addresses Eskom's concerns for lower cost connection alternatives given current funding constraints. A shorter grid solution will also ensure that potential environmental impacts are kept to a minimum.

Eskom's response to a concept phase study indicated the Fox – Umtu 132kV line as the preferred connection point to the national grid. The grid connection solution would include a 132kV Switching Station and a Loop-In Loop-Out Tern line from the 132kV Switching Station to the Fox-Umtu 132kV line (ie ± 1 km double circuit grid line from San Solar switching station to the Fox-Umtu 132kV line (located about 5.7km from Eldoret Substation)). Figure 2.1 illustrates the proposed grid connection solution.

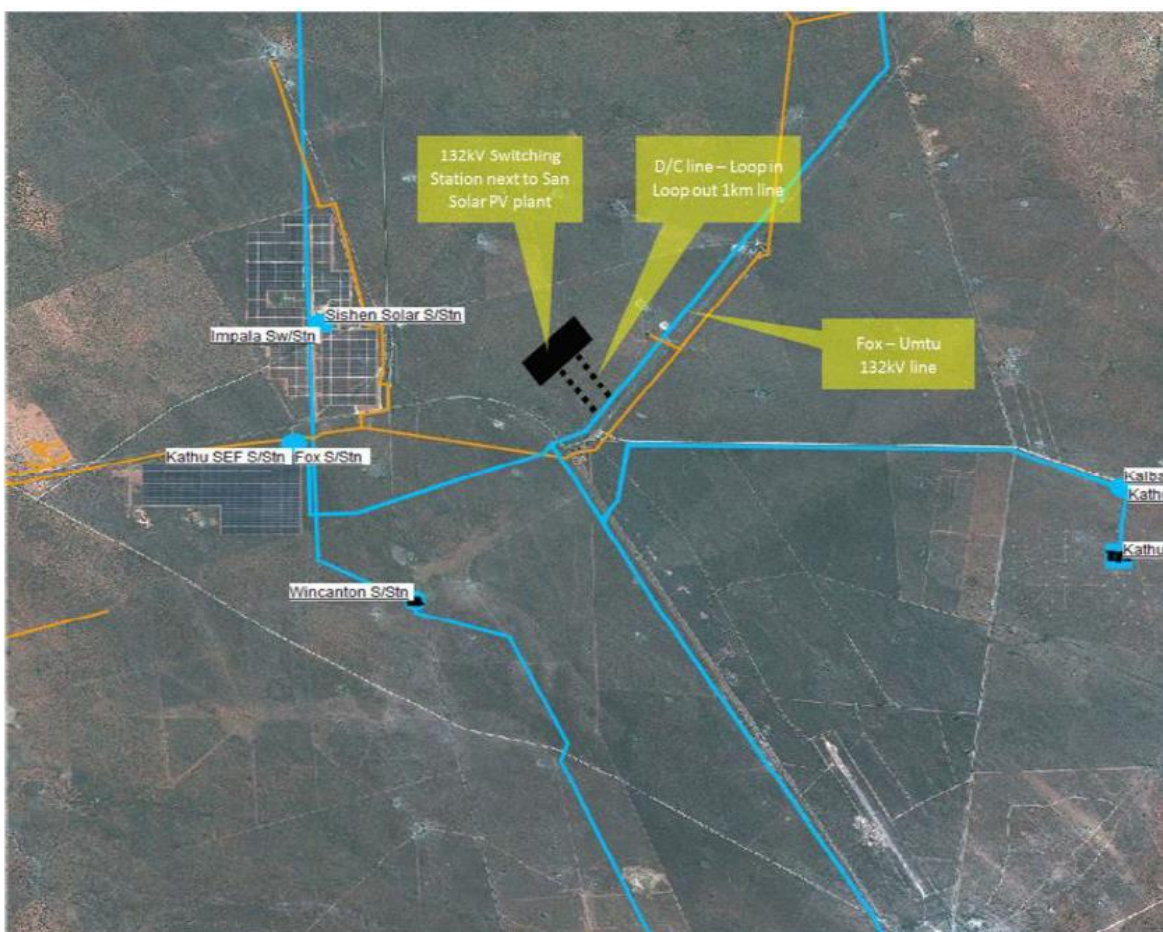


Figure 2.1: Map illustrating the grid connection infrastructure considered for the San Solar PV facility (Source: San Solar, Eskom Cost Estimate Letter, December 2020)

Considering the above, the project site was considered acceptable by the Applicant, and supported as a suitable area within which the solar PV facility can be placed from a technical perspective.

2.4 Description of the Associated Infrastructure

San Solar PV facility will be designed to have a contracted capacity of up to 100MW. The project will make use of fixed-tilt, single-axis tracking, and/or double-axis tracking PV technology. Monofacial or bifacial panels are both considered. PV technology forms part of the energy mix as indicated in the latest IRP for South Africa.

The project will comprise solar panels which, once installed, will stand less than 4m above ground level. The solar panels will include centralised inverter stations, or string inverters mounted above ground. If centralised inverter stations are used, Mega Volt (MV) distribution transformers are located internally, whereas string inverters are containerised with switchgear. The main transformer capacity varies according to detailed design and project-specific requirements.

2.4.1 Water Supply

San Solar PV facility will utilise water during both the construction and operation phases of development. Water is required during construction for dust suppression, and potable water will be required on site for the construction crew. During operations, water is required to clean the PV panels, for human consumption, and for use in the auxiliary buildings (i.e. for use in the office building, ablutions, and canteen). Approximately 10 000m³ of water per year may be required over a 12 to 18-month period during construction, and approximately 50 000m³ of water per year may be required per year over the 25-year operational lifespan of the project.

A request for confirmation of water availability for the construction and operation of the solar energy facility will be submitted to the Gamagara Local Municipality during the EIA process.

2.4.2 Energy Storage

The general purpose and utilisation of the Battery Energy Storage System (BESS) will be to save and store excess electrical output from the facility as it is generated, allowing for a timed release to the national grid when the capacity is required. The BESS will, therefore, provide flexibility in the efficient operation of the electricity grid through decoupling of the energy supply and demand and will allow for longer generating periods of the solar PV facility. Furthermore, the development of the BESS for the project is of importance as the system will ensure that electricity is fed into the national grid when required and excess amounts stored. This will allow for extended hours of generation from the 100MW solar energy facility. The BESS will be contained within insulated containers and will connect to the on-site facility substation via underground cabling which will follow the internal access roads of the facility. **Figure 2.2** provides a general illustration of a BESS.



Figure 0.2: Example of battery storage units installed by Tesla (Source: fastcompany.com)

2.4.3 Panel Cleaning

It is anticipated that the PV panels will be washed twice a year during operation. Only clean water (i.e. with no cleaning products), or non-hazardous biodegradable cleaning products will be utilised for the washing of panels. Wastewater generated by washing panels will either be collected and recycled for future use, or alternatively, in the event that an environmentally friendly non-hazardous biodegradable cleaning product is utilised, wastewater can be allowed to run-off under the panels.

2.4.4 Effluent and Wastewater

During construction, chemical toilets will be used. These will be serviced regularly, and effluent will be disposed of at a registered wastewater treatment works. Any other effluent discharge during construction will be stored in sealed containers/tanks and collected (honey-sucker) and treated by a service provider (the LM/ Contractor) at an approved facility off site. These facilities will be maintained and serviced regularly by an appropriate waste contractor.

2.4.5 Waste

Solid waste generated during construction will mainly be in the form of construction material, excavated substrate and domestic solid waste. Waste will be disposed of in either waste skips and/or scavenger proof recycling bins (where possible) and temporarily placed in a central location for removal by an appropriate contractor. Where possible, waste will be recycled. Non-recyclable solid construction waste will be temporarily held in skips or other appropriate waste containers to be disposed of at an appropriately licensed landfill site. Any other waste and excess material will be removed once construction is complete and disposed of at a registered waste facility.

During construction, use of the following hazardous substances are anticipated: paint, grease, petrol / diesel for trucks, cranes, bulldozers etc. Limited amounts of transformer oils and chemicals. Dangerous goods required to be stored during construction (e.g. limited quantities of fuel, oil, lubricants etc.) will be stored in compliance with relevant legislation (i.e. stored on covered and bunded areas / bin, and disposed of at a registered hazardous waste site). Hazardous waste will be appropriately stored and disposed of.

2.5 Technology considered for the Solar Energy Facility and the Generation of Electricity

San Solar PV facility will have a contracted capacity of 100MW and will make use of PV technology. Solar energy facilities, which utilise PV technology, use the energy from the sun to generate electricity through a process known as the Photovoltaic Effect. This effect refers to photons of light colliding with electrons, and therefore placing the electrons into a higher state of energy to create electricity (refer to **Figure 2.3**).

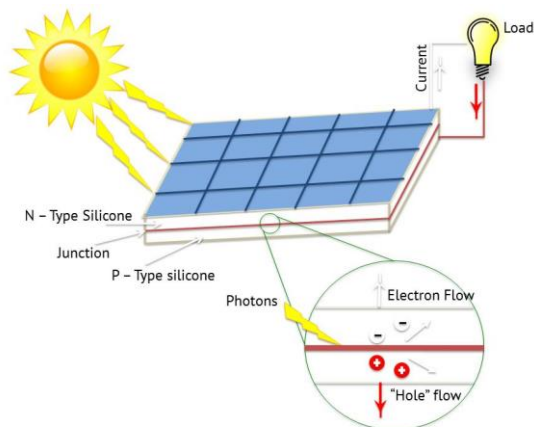


Figure 0.3: Diagram illustrating the Photovoltaic Effect (Source: Centre for Sustainable Energy)

The Photovoltaic Effect is achieved through the use of the following components:

Photovoltaic Cells

A PV cell is made of silicon that acts as a semi-conductor used to produce the Photovoltaic Effect. PV cells are arranged in multiples / arrays and placed behind a protective glass sheet to form a PV panel (refer to **Figure 2.4**). Each PV cell is positively charged on one side and negatively charged on the opposite side, with electrical conductors attached to either side to form a circuit. This circuit captures the released electrons in the form of an electric current (i.e. Direct Current (DC⁵)).

⁵ DC (direct current) is the unidirectional flow or movement of electric charge carriers (which are usually electrons). The intensity of the current can vary with time, but the general direction of movement stays the same at all times. As an adjective, the term DC is used in reference to voltage whose polarity never reverses. In a DC circuit, electrons emerge from the negative, or minus, pole and move towards the positive, or plus, pole. Nevertheless, physicists define DC as traveling from plus to minus. (sourced from <https://whatis.techtarget.com/definition/DC-direct-current>).

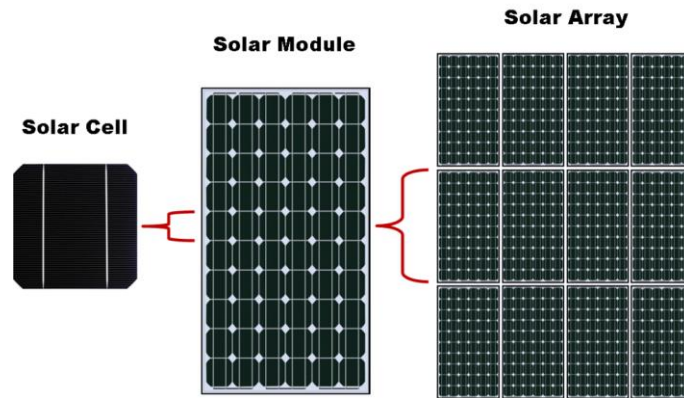


Figure 0.4: Overview of a PV cell, module and array / panel (Source: pveducation.com)

Support Structures

PV panels will be fixed to a support structure. PV panels can either utilise fixed/static support structures, or single or double axis tracking support structures (refer to **Figure 2.5**). PV panels which utilise fixed/static support structures are set at an angle (fixed-tilt PV system) so as to optimise the amount of solar irradiation. With fixed/static support structures the angle of the PV panel is dependent on the latitude of the proposed development and may be adjusted to optimise for summer and winter solar radiation characteristics. PV panels which utilise tracking support structures track the movement of the sun throughout the day so as to receive the maximum amount of solar irradiation.

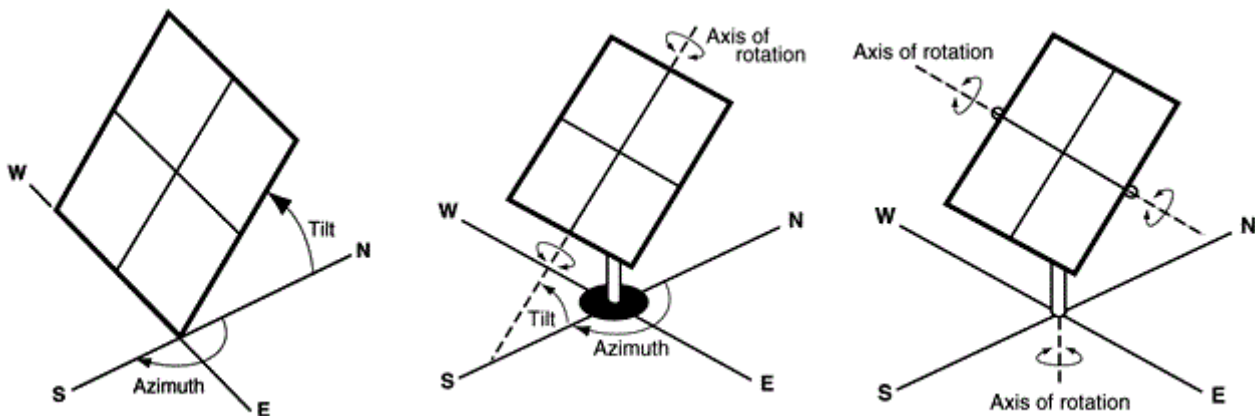


Figure 0.5: Overview of different PV tracking systems (from left to right: fixed-tilt, single-axis tracking, and double-axis tracking (Source: pveducation.com)).

PV panels are designed to operate continuously for more than 25 years, mostly unattended and with low maintenance.

2.6 Activities during the Project Development Stages

A series of activities are proposed as part of the design, pre-construction, construction, operation, and decommissioning phases associated with the development of San Solar PV facility. These are discussed in more detail under the respective sub-headings below.

2.6.1 Design and Pre-Construction Phase

Planning: Several post-authorisation factors are expected to influence the final design of the solar energy facility and could result in small-scale modifications of the PV array and/or associated infrastructure. An objective of the Engineering, Procurement and Construction (EPC) Contractor, who will be responsible for the overall construction of the project, will be to comply with the approved facility design as far as possible. It should be understood however, that the construction process is dynamic and that unforeseen changes to the project specifications may take place. This Scoping Report therefore describes the project in terms of the best available knowledge at the time. The final facility design is required to be approved by the DFFE. Importantly, should there be any substantive changes or deviations from the original scope or layout of the project, the DFFE will need to be notified and where relevant, environmental approval obtained.

Conduct Surveys: Prior to initiating construction, a number of surveys will be required including, but not limited to, confirmation of the micro-siting footprint (i.e. the precise location of the PV panels, on-site facility substation and the associated infrastructure) and a geotechnical survey. Geotechnical surveys acquire information regarding the physical characteristics of soil and rocks underlying a proposed project site and informs the design of earthworks and foundations for structures.

2.6.2 Construction Phase

The construction phase will take approximately 12 to 18 months to complete, and will entail a series of activities including:

Procurement and employment

At the peak of construction, the project is likely to create a maximum of 350 employment opportunities. These employment opportunities will be temporary and will last for a period of approximately 12 to 18 months (i.e. the length of construction). Employment opportunities generated during the construction phase will include low skilled, semi-skilled, and skilled opportunities. Solar PV projects make use of high levels of unskilled and semi-skilled labour so there will be good opportunity to use local labour, where available. Employment opportunities will peak during the construction phase and significantly decline during the operation phase. The injection of income into the area in the form of wages will represent an opportunity for the local economy and businesses in the area. The majority of the labour force is expected to be sourced from the surroundings towns.

Establishment of an Access Road

Access to the development area will be established for the construction and operation of San Solar PV facility. Access to the project site is via the R380 regional road. Within the development footprint itself, access will be required from new/existing roads for construction purposes (and limited access for maintenance during operation). The final layout will be determined following the identification of site related sensitivities.

Undertake Site Preparation

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

Transport of Components and Equipment to Site

The national, regional, secondary and proposed internal access roads will be used to transport all components and equipment required during the construction phase. Some of the components (i.e. substation transformer) may be defined as abnormal loads in terms of the National Road Traffic Act (No. 93

of 1996) (NRTA)⁶ by virtue of the dimensional limitations. Typical civil engineering construction equipment will need to be brought to the project site (e.g. excavators, trucks, graders, compaction equipment, cement trucks, etc.) as well as components required for the mounting of the PV support structures, construction of the on-site facility substation and site preparation.

Establishment of Laydown Areas on Site

Laydown and storage areas will be required for typical construction equipment. Once the required equipment has been transported to site, a dedicated equipment construction camp and laydown area will need to be established adjacent to the workshop area. The equipment construction camp serves to confine activities and storage of equipment to one designated area, to limit the potential ecological impacts associated with this phase of the development. The laydown area will be used for the assembly of the PV panels, and the general placement/storage of construction equipment. It is anticipated that the temporary laydown area will be included within development footprint of the solar facility.

Erect PV Panels and Construct Substation and Invertors

The construction phase involves installation of the PV solar panels, structural and electrical infrastructure required for the operation of San Solar. In addition, preparation of the soil and improvement of the access roads are likely to continue for most of the construction phase. For array installations, vertical support posts will be driven into the ground. Depending on the results of the geotechnical report, a different foundation method, such as screw pile, helical pile, micropile or drilled post/piles could be used. The posts will hold the support structures (tables) on which the PV modules would be mounted. Brackets will attach the PV modules to the tables. Trenches are to be dug for the underground AC and DC cabling, and the foundations of the inverter enclosures and transformers will be prepared. While cables are being laid and combiner boxes are being installed, the PV tables will be erected. Wire harnesses will connect the PV modules to the electrical collection systems. Underground cables and overhead circuits will connect the Power Conversion Stations (PCS) to the on-site AC electrical infrastructure, and ultimately the facility substation.

The construction of the on-site facility substation will require a survey of the footprint, site clearing and levelling and construction of access road(s) (where applicable), construction of a level terrace and foundations, assembly, erection, installation and connection of equipment, and rehabilitation of any disturbed areas, and protection of erosion sensitive areas.

Establishment of Ancillary Infrastructure

The establishment of the ancillary infrastructure and support buildings will require the clearing of vegetation and levelling of the development footprint, and the excavation of foundations prior to construction. Laydown areas for building materials and equipment associated with these buildings will also be required.

Undertake Site Rehabilitation

Once construction is completed and all construction equipment has been removed, the development enveloped will be rehabilitated where practical and reasonable. In addition, on full commissioning of San Solar PV, any access points which are not required during operation must be closed and rehabilitated accordingly.

2.6.3 Operation Phase

⁶ A permit will be required in accordance with Section 81 of the National Road Traffic Act (No. 93 of 1996) (NRTA) which pertains to vehicles and loads which may be exempted from provisions of Act.

San Solar PV is expected to operate for a minimum of 25 years. The facility will operate continuously, 7 days a week, and will include battery storage. While the solar facility will be largely self-sufficient, monitoring and periodic maintenance activities will be required. Key elements of the Operation and Maintenance (O&M) plan include monitoring and reporting the performance of the solar energy facility, conducting preventative and corrective maintenance, receiving visitors, and maintaining security.

The operation phase will create approximately 50 full-time equivalent employment positions which will include low-skilled, semi-skilled and skilled personnel. Employees that can be sourced from the local municipal area include the less skilled and semi-skilled personnel (such as safety and security staff and certain maintenance crew). Highly skilled personnel may need to be recruited from outside the local area where these resources are not available within the area.

2.6.4 Decommissioning Phase

Depending on the continued economic viability of San Solar PV following the initial 20-year operation lifespan, the solar energy facility will either be decommissioned, or the operation phase will be extended. If it is deemed financially viable to extend the operation phase, existing components would either continue to operate or be disassembled and replaced with new, more efficient technology / infrastructure available at the time. If the decision is made to decommission the facility, the following decommissioning activities will take place:

Site Preparation

Site preparation activities will include confirming the integrity of the access to the site to accommodate the required decommissioning equipment.

Disassembly and removal of existing components

When the solar energy facility is ultimately decommissioned, the equipment to be removed will depend on the land use proposed for the project site at the time. All above ground facilities that are not intended for future use will be removed. Much of the above ground wire, steel, and PV panels of which the system is comprised are recyclable materials and would be recycled to the extent feasible. The components of the solar energy facility would be de-constructed and recycled or disposed of in accordance with applicable regulatory requirements. The site will be rehabilitated where required and can potentially be returned to a beneficial land-use.

Future plans for the site and infrastructure after decommissioning

The generation capacity of the facility would have degraded by approximately 15% over the 20-year operational lifespan. The solar energy facility will potentially have the opportunity to generate power for a Merchant Market operation (i.e. the client would sell power on a bid basis to the market). Another option for the site after decommissioning is for agricultural activities to resume.

CHAPTER 3: POLICY AND LEGISLATIVE CONTEXT

This Chapter provides an overview of the policy and legislative context within which the development of a solar PV facility is proposed. It identifies environmental 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 which may be applicable to or have bearing on the proposed project.

3.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of an Impact Assessment Report

This chapter of the Scoping Report includes the following information required in terms of Appendix 2: Content of Scoping Report:

Requirement	Relevant Section
(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 3 provides an overview of the policy and legislative context which is considered to be associated with the development of the San Solar PV facility. The regulatory and planning context has been considered at national, provincial and local levels. A description of the policy and legislative context within which San Solar PV facility is proposed is included in sections 3.3, 3.4, 3.5 and 3.6.

3.2 Strategic Electricity Planning in South Africa

The need to expand electricity generation capacity in South Africa is based on national policy and informed by on-going strategic planning undertaken by the Department of Mineral Resources and Energy (DMRE). The hierarchy of policy and planning documentation that support the development of renewable energy projects such as a solar energy facility is illustrated in **Figure 3.1**. These policies are discussed in more detail in the following sections, along with the provincial and local policies or plans that have relevance to the development of San Solar PV facility.

The South African energy industry is evolving rapidly, with regular changes to legislation and industry role-players. The regulatory hierarchy for an energy generation project of this nature consists of three tiers of authority who exercise control through both statutory and non-statutory instruments – that is National, Provincial and Local levels. As solar energy developments are a multi-sectoral issue (encompassing economic, spatial, biophysical, and cultural dimensions) various statutory bodies are likely to be involved in the approval process of a solar energy project and the related statutory environmental assessment process.

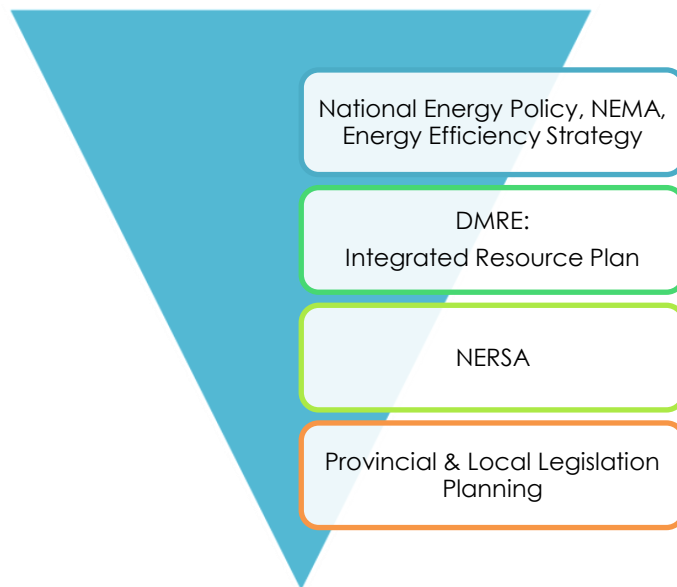


Figure 3.1: Hierarchy of electricity and planning documents

At **National Level**, the main regulatory agencies are:

- » **Department of Mineral Resources and Energy (DMRE):** This Department is responsible for policy relating to all energy forms and for compiling and approving the Integrated Resource Plan (IRP) for electricity. Furthermore, the Department is also responsible for granting approvals for the use of land which is contrary to the objects of the Mineral and Petroleum Resource Development Act (Act No. 28 of 2002) (MPRDA) in terms of Section 53 of the Act. Therefore, in terms of the Act, approval from the Minister is required to ensure that proposed activities do not sterilise mineral resources that may occur within the project site and development area.
- » **National Energy Regulator of South Africa (NERSA):** NERSA is responsible for regulating all aspects of the electricity sector and will ultimately issue licenses for IPP projects to generate electricity.
- » **Department of Forestry, Fisheries, and the Environment (DFFE):** This Department is responsible for environmental policy and is the controlling authority in terms of NEMA and the EIA Regulations, 2014 (GN R326) as amended. DEA is the Competent Authority for this project (as per GN R779 of 01 July 2016), and is charged with granting the EA for the project under consideration.
- » **The South African Heritage Resources Agency (SAHRA):** SAHRA is a statutory organisation established under the National Heritage Resources Act (No. 25 of 1999) (NHRA), as the national administrative body responsible for the protection of South Africa's cultural heritage.
- » **South African National Roads Agency Limited (SANRAL):** This Agency is responsible for the regulation and maintenance of all national road routes.
- » **Department of Human Settlements, Water and Sanitation (DHSWS):** This Department is responsible for effective and efficient water resources management to ensure sustainable economic and social development. This Department is also responsible for evaluating and issuing licenses pertaining to water use (i.e. Water Use Licenses (WUL) and General Authorisation).
- » **The Department of Agriculture, Rural Development and Land Reform (DARDLR):** This Department is the custodian of South Africa's agricultural resources and is primarily responsible for the formulation and implementation of policies governing the agriculture sector.

At **Provincial Level**, the main regulatory agencies are:

- » **Provincial Government of the Northern Cape – Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAEARD&LR):** This Department is the commenting authority for the EIA process for the project and is responsible for issuing of biodiversity and conservation-related permits. DAEARD&LR's involvement relates specifically to sustainable resource management, conservation of protected species and land care.
- » **Northern Cape Department of Transport, Safety and Liaison: (NC DTSL):** This Department provides effective co-ordination of crime prevention initiatives, provincial police oversight, traffic management and road safety towards a more secure environment.
- » **Ngwao-Boswa Ya Kapa Bokone (NBKB):** This Department is responsible for the identification, conservation and management of heritage resources, as well as commenting on heritage related issues within the province.

At the **Local Level**, the local and district municipal authorities are the principal regulatory authorities responsible for planning, land use and the environment. In the Northern Cape Province, both the local and district municipalities play a role. The local municipality includes the Gamagara Local Municipality which forms part of the John Taolo Gaetsewe District Municipality. In terms of the Municipal Systems Act (No. 32 of 2000), it is compulsory for all municipalities to go through an Integrated Development Planning (IDP) process to prepare a five-year strategic development plan for the area under their control.

The relevant legislation and policies listed and discussed below are relevant to the San Solar PV facility development.

3.3 Policy and Planning Considerations on International, National, Provincial and Local Levels

3.3.1 Policy and planning on an International Level

South Africa has committed to various international policies which relate to environmental concerns, specifically that of climate change and global warming. **Table 3.1** below provides a summary of the international policies and plans that South Africa has made commitments towards, and how the proposed development of the San Solar PV facility aligns with the thinking or commitments of these agreements.

Table 3.1: International policies and plans relevant to the San Solar PV facility

Policy or Plan	Is the development of the San Solar PV facility aligned with this policy or plan?
The Kyoto Protocol, 1997	Yes. The protocol calls for the reduction of South Africa's greenhouse gas emissions through actively cutting down on using fossil fuels, or by utilising more renewable resources. The development of San Solar PV facility will enable the evacuation of additional capacity to the renewable energy sector of the country and strengthen the commitment and action plan to achieve the requirements as set out in the protocol.
United Nations Framework Convention on Climate Change and COP21 – Paris Agreement	Yes. South Africa supports the adoption of the Paris Agreement which has the main objective of addressing the climate change issue and marks the first international political response to climate change. South Africa has set out a goal of 17GW of renewable energy by 2030 within the IRP of 2019. Through the development of renewable energy projects (including San Solar PV facility) additional renewable energy will be made available to the country, which in turn will demonstrate the contribution that South Africa

Policy or Plan	Is the development of the San Solar PV facility aligned with this policy or plan?
The Equator Principles 4 (October 2020)	<p>is making to the global response to climate change specifically relating to the development of the renewable energy sector.</p> <p>Yes. The Equator Principles 4 constitute a financial industry benchmark used for determining, assessing, and managing a project's environmental and social risks. The Equator Principles (Eps) are primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making. The EPs are applicable to large infrastructure projects and apply globally to all industry sectors. In terms of the EPs, South Africa is a non-designated country, and as such the assessment process for projects located in South Africa evaluates compliance with the applicable IFC Performance Standards on Environmental and Social Sustainability and Environmental Health and Safety (EHS) Guidelines. The San Solar PV facility is currently being assessed in accordance with the requirements of the 2014 EIA Regulations, as amended (GNR 326), published in terms of Section 24(5) of the National Environmental Management Act (No. 107 of 1998) (NEMA), which is South Africa's national legislation providing for the authorisation of certain controlled activities. Through this assessment, all potential social and environmental risks are identified and assessed, and appropriate mitigation measures proposed.</p>
International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability, January 2012	<p>Yes. The overall objectives of the IFC performance standards are to fight poverty, do no harm to people or the environment, fight climate change by promoting low carbon development, respect human rights, promote gender equality, provide information prior to project development, collaborate with the project developer in order to achieve the performance standard, provide advisory services and notify countries of trans boundary impacts. When considering the development of the grid connection infrastructure associated with the development of San Solar PV facility the following performance standards are anticipated to be applicable at this stage of the BA process:</p> <ul style="list-style-type: none"> » <i>Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts</i> » <i>Performance Standard 2: Labour and Working Conditions</i> » <i>Performance Standard 3: Resource Efficiency and Pollution Prevention</i> » <i>Performance Standard 4: Community Health, Safety and Security</i> » <i>Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</i> » <i>Performance Standard 8: Cultural Heritage</i>

3.3.2 Policy and planning on a National Level

Further to the South African government's commitment in August 2011 to support the development of renewable energy capacity, the DMRE initiated the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) to procure renewable energy from the private sector in a series of rounds. To date, the Department has procured 6 422MW of renewable energy capacity from 112 independent power producers (IPPs), with 4 742MW operational and made available to the grid⁷. National policies have to be considered for the construction and operation of the solar PV facility to ensure that the development is in line with the planning of the country.

⁷<http://www.nersa.org.za/wp-content/uploads/2021/05/Monitoring-of-Renewable-Energy-Performance-of-Power-Plants-%E2%80%93-Performance-of-Power-Plants-in-2020>

A brief review of the most relevant national policies is provided below in **Table 3.2**. The development of San Solar PV facility is considered to align with the aims of these policies, even if contributions to achieving the goals therein are only minor.

Table 3.2: Relevant national legislation and policies relevant to the San Solar PV facility

Relevant legislation or policy	Relevance to San Solar PV facility
Constitution of the Republic of South Africa, 1996	<p>Section 24 of the Constitution pertains specifically to the environment. It 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.</p> <p>The Constitution outlines the need to promote social and economic development. Section 24 of the Constitution therefore requires that development be conducted in such a manner that it does not infringe on an individual's environmental rights, health, or well-being. This is especially significant for previously disadvantaged individuals who are most at risk to environmental impacts.</p>
National Environmental Management Act (No. 107 of 1998) (NEMA)	<p>This piece of legislation is South Africa's key piece of environmental legislation and sets the framework for environmental management in South Africa. NEMA is founded on the principle that everyone has the right to an environment that is not harmful to their health or well-being as contained within the Bill of Rights.</p> <p>The national environmental management principles state that the social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.</p> <p>The need for responsible and informed decision-making by government on the acceptability of environmental impacts is therefore enshrined within NEMA.</p>
White Paper on the Energy Policy of the Republic of South Africa (1998)	<p>The White Paper on Energy Policy places emphasis on the expansion of energy supply options to enhance South Africa's energy security. This can be achieved through increased use of RE and encouraging new entries into the generation market.</p> <p>The policy states that the advantages of RE include, minimal environmental impacts during operation in comparison with traditional supply technologies, generally lower running costs, and high labour intensities. Disadvantages include, higher capital costs in some cases, lower energy densities, and lower levels of availability, depending on specific conditions, especially with sun and wind-based systems. Nonetheless, renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future.</p>
White Paper on the Renewable Energy Policy of the Republic of South Africa (2003)	<p>The White Paper on Renewable Energy Policy supplements Government's predominant policy on energy as set out in the White Paper on the Energy Policy of the Republic of South Africa (DME, 1998). The policy recognises the potential of RE and aims to create the necessary conditions for the development and commercial implementation of RE technologies.</p> <p>The White Paper on RE sets out Government's vision, policy principles, strategic goals, and objectives for promoting and implementing RE in South Africa. The country relies heavily on coal to meet its energy needs due to its abundant, and fairly accessible</p>

Relevant legislation or policy	Relevance to San Solar PV facility
	<p>and affordable coal resources. However, massive RE resources that can be sustainable alternatives to fossil fuels, have so far remained largely untapped.</p> <p>The White Paper on Renewable Energy of 2003 set a target of 10 000GWh to be generated from RE by 2013 to be produced mainly from biomass, wind, solar and small-scale hydro. The target was subsequently reviewed in 2009 during the RE summit of 2009. The policy supports the investment in RE facilities as they contribute towards ensuring energy security through the diversification of energy supply, reducing GHG emissions and the promotion of RE sources.</p>
National Energy Act (No. 34 of 2008)	<p>The purpose of the National Energy Act (No. 34 of 2008) is to ensure that diverse energy resources are available, in sustainable quantities and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, while taking environmental management requirements into account. In addition, the Act also provides for energy planning, and increased generation and consumption of Renewable Energies (REs).</p> <p>The Act provides the legal framework which supports the development of RE facilities for the greater environmental and social good and provides the backdrop against which South Africa's strategic planning regarding future electricity provision and supply takes place.</p>
The Electricity Regulation Act (No. of 2006)	<p>The Electricity Regulation Act of 2006, replaced the Electricity Act (No. 41 of 1987), as amended, with the exception of Section 5B, which provides funds for the energy regulator for the purpose of regulating the electricity industry. The Act establishes a national regulatory framework for the electricity supply industry and introduces the National Energy Regulator (NERSA) as the custodian and enforcer of the National Electricity Regulatory Framework. The Act also provides for licences and registration as the manner in which the generation, transmission, distribution, trading, and import and export of electricity are regulated.</p>
Integrated Energy Plan (IEP), 2015	<p>The Integrated Energy Plan (IEP) (which was developed under the National Energy Act (No. 34 of 2008)), recognises that energy is essential to many human activities, and is critical to the social and economic development of a country. The purpose of the IEP is essentially to ensure the availability of energy resources, and access to energy services in an affordable and sustainable manner, while minimising associated adverse environmental impacts. Energy planning therefore needs to balance the need for continued economic growth with social needs, and the need to protect the natural environment.</p>
Integrated Resource Plan for Electricity (IRP) 2010-2030 (2019)	<p>The Integrated Resource Plan (IRP) for Electricity 2010 – 2030 is a subset of the IEP and constitutes South Africa's National electricity plan. The primary objective of the IRP is to determine the long-term electricity demand and detail how this demand should be met in terms of generating capacity, type, timing and cost. The IRP also serves as input to other planning functions, including amongst others, economic development and funding, and environmental and social policy formulation.</p> <p>On 27 August 2018, the then Minister of Energy published a draft IRP which was issued for public comment. The lengthy public participation and consultation process has culminated in the issue of the overdue IRP 2019 which updates the energy forecast from the current period to the year 2030. Since the promulgated IRP 2010, the following capacity developments have taken place:</p>

Relevant legislation or policy	Relevance to San Solar PV facility
	<ul style="list-style-type: none"> » A total of 6 422MW has been procured thus far under the REIPPP Programme, with 3 876MW being currently operational and made available to the grid. In addition, IPPs have commissioned 1 005MW from two (2) Open Cycle Gas Turbines (OCGT) peaking plants; and » Under the Eskom Build Programme, 1 332MW has been procured from the Ingula Pumped Storage Project, 1 588MW and 800MW from the Medupi and Kusile power stations and 100MW from the Sere Wind Farm. <p>Provision has been made for the following new capacity by 2030:</p> <ul style="list-style-type: none"> » 1 500MW of coal; » 2 500MW of hydro; » 6 000MW of solar PV; » 14 400MW of wind; » 1 860MW of nuclear; » 2 088MW of storage; » 3 000MW of gas/diesel; and » 4 000MW from other distributed generation, co-generation, biomass and landfill technologies. <p>Based on the IRP 2019, 1 474MW has been installed for solar PV facilities, whereas, 814MW has already been procured. In addition, 1 000MW has been allocated for solar PV facilities from 2022 to 2030. This will bring the total installed capacity of solar PV facilities by 2030 to 8 288MW. Therefore, the development of the San Solar PV facility is supported by the IRP 2019.</p>
<p>Renewable Energy Policy in South Africa</p>	<p>Yes. Support for the Renewable Energy Policy is guided by a rationale that South Africa has a very attractive range of renewable energy resources, particularly solar and wind, and that renewable applications are, in fact, the least cost energy service in many cases from a fuel resource perspective (i.e. the cost of fuel in generating electricity from such technology); more so when social and environmental costs are taken into account. However, the National Energy Policy acknowledges that the development and implementation of renewable energy applications has been largely neglected in South Africa. Challenges regarding the implementation of renewable energy have been identified. Through the development of renewable energy projects (including the San Solar PV facility), additional renewable energy will be made available which will assist with the further growth and development of the renewable energy sector.</p>
<p>National Development Plan 2030 (2012)</p>	<p>The National Development Plan (NDP) 2030 is a plan prepared by the National Planning Commission in consultation with the South African public which is aimed at eliminating poverty and reducing inequality by 2030.</p> <p>In terms of the Energy Sectors role in empowering South Africa, the NDP envisages that, by 2030, South Africa will have an energy sector that promotes:</p> <ul style="list-style-type: none"> » Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient energy service at competitive rates, while supporting economic growth through job creation. » Social equity through expanded access to energy at affordable tariffs and through targeted, sustainable subsidies for needy households. » Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change.

Relevant legislation or policy	Relevance to San Solar PV facility
	<p>The NDP aims to provide a supportive environment for growth and development, while promoting a more labour-absorbing economy. The development of San Solar PV facility Supports the NDP through the development of energy-generating infrastructure which will not lead to the generation of GHGs and will result in economic development and growth of the area surrounding the development area.</p>
<p>Strategic Integrated Projects (SIPs)</p>	<p>The Presidential Infrastructure Coordinating Commission (PICC) is integrating and phasing investment plans across 18 Strategic Integrated Projects (SIPs) which have 5 core functions, including to unlock opportunity, transform the economic landscape, create new jobs, strengthen the delivery of basic services and support the integration of African economies.</p> <p>SIP 8 of the energy SIPs supports the development of RE projects as follows: Green energy in support of the South African economy: Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP 2010) and supports bio-fuel production facilities.</p> <p>The development of San Solar PV facility is aligned with SIP 8 as it constitutes a green energy initiative that would contribute clean energy in accordance with the IRP 2010 – 2030.</p>
<p>New Growth Path (NGP) Framework, 2010</p>	<p>Yes. The purpose of the New Growth Path (NGP) Framework is to provide effective strategies towards accelerated job-creation through the development of an equitable economy and sustained growth. The target of the NGP is to create 5 million jobs through the green economy. With economic growth and employment creation as the key indicators identified in the NGP. To achieve this, government will seek to, amongst other things, identify key areas for large-scale employment creation, as a result of changes in conditions in South Africa and globally, and to develop a policy package to facilitate employment creation in these areas. The San Solar PV facility will assist with the creation of both temporary and permanent employment opportunities during the construction and operation phases, which will contribute, albeit to a limited extent, to the economy and sustainable growth.</p>
<p>National Climate Change Response Policy, 2011</p>	<p>The Conference of the Parties (COP) 21 was held in Paris from 30 November to 12 December 2015. From this conference, an agreement to tackle global warming was reached between 195 countries. This Agreement is open for signature and subject to ratification, acceptance or approval by States and regional economic integration organisations that are Parties to the Convention from 22 April 2016 to 21 April 2017. Thereafter, this Agreement shall be open for accession from the day following the date on which it is closed for signature. The agreement can only be sanctioned once it has been ratified by 55 countries, representing at least 55% of emissions.</p> <p>South Africa signed the Agreement in April 2016 and ratified the agreement on 01 November 2016. The Agreement was assented to by the National Council of Provinces on 27 October 2016, and the National Assembly on 1 November 2016. The Agreement was promulgated on 04 November 2016, thirty days after the date on which at least 55 Parties to the Convention, which account for at least 55% of the total global greenhouse gas emissions have deposited their instruments of ratification, acceptance, approval or accession with the Depositary.</p>

Relevant legislation or policy	Relevance to San Solar PV facility
	<p>South Africa's National Climate Change Response Policy (NCCRP) establishes South Africa's approach to addressing climate change, including adaptation and mitigation responses. The NCCRP formalises Government's vision for a transition to a low carbon economy, through the adoption of the 'Peak, Plateau and Decline' (PPD) GHG emissions trajectory whereby South Africa's emissions should peak between 2020 and 2025, plateau for approximately a decade, and then decline in absolute terms thereafter, and based on this the country has pledged to reduce emissions by 34% and 42% below Business As Usual (BAU) emissions in 2020 and 2025, respectively.</p> <p>The policy provides support for San Solar PV, which will contribute to managing climate change impacts, supporting the emergency response capacity, as well as assist in reducing GHG emissions in a sustainable manner.</p>
Climate Change Bill, 2018	<p>On 08 June 2018, the Minister of Environmental Affairs published the Climate Change Bill ("the Bill") for public comment. The Bill provides a framework for climate change regulation in South Africa aimed at governing South Africa's sustainable transition to a climate resilient, low carbon economy and society. The Bill provides a procedural outline that will be developed through the creation of frameworks and plans.</p> <p>San Solar PV facility consists of a renewable energy generation facility and would not result in the generation or release of emissions during its operation.</p>

3.3.3 Policy and planning at a Provincial Level

A brief review of the most relevant provincial policies is provided below in **Table 3.3**. The proposed development is considered to align with the aims of these policies, even if contributions to achieving the goals therein are only minor.

Table 3.3: Relevant provincial legislation and policies for the San Solar PV facility

Relevant policy	Relevance to San Solar PV facility
Northern Cape Provincial Spatial Development Framework (PSDF) 2012	<p>The Northern Cape Provincial Spatial Development Framework (PSDF) 2012 states that the overarching goal for the province is to enable sustainability through sustainable development. The province considers social and economic development as imperative in order to address the most significant challenge facing the Northern Cape, which is poverty.</p> <p>The PSDF identifies key sectoral strategies and plans which are considered to be the key components of the PSDF. Sectoral Strategy 19 refers to a provincial renewable energy strategy. Within the PSDF a policy has been included which states that renewable energy sources (including the utilisation of solar energy) are to comprise 25% of the province's energy generation capacity by 2020.</p> <p>The overall energy objective for the province also includes promoting the development of renewable energy supply schemes which are considered to be strategically important for increasing the diversity of domestic energy supply and avoiding energy imports, while also minimising the detrimental environmental impacts. The implementation of sustainable renewable energy is also to be promoted within the province through appropriate financial and fiscal instruments.</p>

Relevant policy	Relevance to San Solar PV facility
<p>Northern Cape Provincial Spatial Development Framework (PSDF) 2018 Review</p>	<p>The development of San Solar PV Facility supports the overall energy objective of the province to have 25% of its electricity from renewable energy sources.</p> <p>The review of the Northern Cape PSDF (2018) refers to infrastructure investment and that a balance must be maintained between investments aimed at meeting the social needs of communities and investment aimed at promoting economic development and job creation.</p> <p>The Spatial Development Strategy identified in the PSDF for basic infrastructure includes the achieving the provision of green infrastructure which includes renewable energy.</p> <p>As part of the Vision 2040 of the PSDF key opportunities are identified for the province. The strengthening of the development triangle that is formed by the linking of Kimberley, Vryburg, Upington and De Aar. The development triangle sustains a diverse economy with strong mining, agricultural and renewable energy sectors. It is stated in the PSDF that a sustainable and viable economic network must be driven within the development triangle to improve the return of public investment in the Province.</p> <p>The development of San Solar PV Facility will contribute to the economic network of the province specifically in terms of the renewable sector, albeit it does not fall within the development triangle.</p>
<p>The Northern Cape Climate Change Response Strategy</p>	<p>The key aspects of the Northern Cape Climate Change Response Strategy (NCCCRS) Report are summarised in the MEC's (NCPG: Environment and Nature Conservation) 2011 budget speech: <i>"The Provincial Climate Change Response Strategy will be underpinned by specific critical sector climate change adaptation and mitigation strategies that include the Water, Agriculture and Human Health sectors as the 3 key Adaptation Sectors, the Industry and Transport alongside the Energy sector as the 3 key Mitigation Sectors with the Disaster Management, Natural Resources and Human Society, livelihoods and Services sectors as 3 remaining key. Sectors to ensure proactive long-term responses to the frequency and intensity of extreme weather events such as flooding and wildfire, with heightened requirements for effective disaster management"</i>.</p> <p>Key points from the MEC address include the NCPG's commitment to develop and implement policy in accordance with the National Green Paper for the National Climate Change Response Strategy (2010), and an acknowledgement of the Northern Cape Province's extreme vulnerability to climate-change driven desertification. The development and promotion of a provincial green economy, including green jobs, and environmental learnership is regarded as an important provincial intervention in addressing climate change. The renewable energy sector, including solar and wind energy (but also biofuels and energy from waste), is explicitly indicated as an important element of the Provincial Climate Change Response Strategy.</p> <p>The development of San Solar PV Facility will assist in achieving (although only to a limited extent) the promotion of the provincial green economy of the Northern Cape.</p>
<p>Northern Cape Province Green Document</p>	<p>The NCP Green Document (2017-2018) was prepared by the Northern Cape Department of Economic Development and Tourism and provides an impact assessment of IPPs on the communities in the province located within a 50km radius from existing facilities. The document notes that the NCP is nationally a leader in commercial-scale renewable energy projects. By 2018, a total of 23 IPP projects in the province had been integrated into the national grid. These projects include Solar PV, Concentrated Solar, and Wind Energy Facilities. The document notes that through their economic development</p>

Relevant policy	Relevance to San Solar PV facility
	<p>obligations, these projects have already made a significant positive contribution to affected communities. Much of the effort has been directed at supporting local education. The document also notes that, as these projects are committed to 20-year minimum lifespans, they collectively hold a tremendous potential for socio-economic upliftment.</p> <p>The development of the San Solar PV facility will contribute towards further socio-economic upliftment in the Northern Cape Province.</p>

3.3.4 Policy and planning at a Local Level

The local tiers of government relevant to the San Solar PV facility project are the Gamagara Local Municipality and the John Taolo Gaetsewe District Municipality. Instruments and/or policies at both the district and local level contain objectives which align with the development of San Solar PV facility. These include, economic growth, job creation, community upliftment and poverty alleviation.

Table 3.4: Relevant district and local legislation and policies for San Solar PV facility

Relevant policy	Relevance to San Solar PV facility
<p>John Taolo Gaetsewe District Municipality Phase 5 Draft Spatial Development Framework (SDF) (2017)</p>	<p>The main economic sectors applied within the John Taolo Gaetsewe District Municipality include eco-tourism, agriculture, mining and community services. Even though the development of renewable energy is not specifically mentioned as part of the framework, the development of a solar energy facility within the area will add to the current economic sectors. That specifically includes community services, as the development of a solar energy facility will aid in the provision of electricity, as well as employment opportunities and skills development on a local level.</p> <p>The SDF states that one of the key objectives for the District Municipality is to attract new business. With the development of a SEF within the area, other developers might be encouraged to consider the area as a viable location for further development. This could attract new business to the area and promote financial and socio-economic development within the District Municipality.</p>
<p>John Taolo Gaetsewe District Municipality Final Draft Integrated Development Plan (IDP) 2021 – 2022</p>	<p>The vision of the John Taolo Gaetsewe District Municipality (DM) as contained within its IDP 2021 – 2022 is: <i>“Working together for a better life for all in the district.”</i></p> <p>The mission statement of John Taolo Gaetsewe District Municipality reflects what the DM will do in an on-going manner to strive towards achieving its vision. The mission of the John Taolo Gaetsewe District Municipality is:</p> <p><i>“Accelerating the implementation of integrated development initiatives and providing support to local municipalities.”</i></p> <p>In terms of development priorities, the IDP (2021-2022) determined that the results of the 2016 Community Survey suggested that the number of people residing within the District Municipality is increasing, as a direct result of mining related activities. Implications for the DM in this regard include:</p> <ul style="list-style-type: none"> » The scope and extent of the District Municipality 's Spatial Development Framework (SDF).

Relevant policy	Relevance to San Solar PV facility
	<p>» Service delivery demands placed on the District Municipality and its local municipalities.</p> <p>» The grading of the local municipalities, and the resources (i.e. grants and subsidies) made available to them.</p> <p>The activities of the District Municipality need to reflect its population demographics, both in terms of service delivery, as well as in terms of employment equity. Gender, racial and disability population demographics have been identified as being of particular importance in this regard. As a result, special interest groups, such as the youth, women and persons with disabilities require specific focus in the strategic priorities of the DM.</p> <p>The implementation of San Solar PV facility would contribute towards addressing some of the John Taolo Gaetsewe DM's development priorities through the creation of new employment opportunities which could support a portion of the increasing population, while the increase in revenue from the project could assist in the municipality in addressing service delivery demands.</p>
<p>Gamagara Local Municipality Integrated Development Plan (IDP), 2021 – 2022</p>	<p>The vision statement for the Gamagara Local Municipality as contained within the IDP 2021 – 2022 is as follows:</p> <p><i>"Building prosperous and sustainable communities,"</i> adopted in February and 2018 and still remains relevant. The development trajectory of the municipality is to build an industrial city by 2030 and a manufacturing hub of the Northern Cape, the country, and the region by 2060. In building towards the IDP present the Six Strategic Objectives to ensure that dream to an industrial city and ultimately manufacturing city by 2060, while "building prosperous and sustainable communities" of Gamagara:</p> <ol style="list-style-type: none"> 5. Improve life for all through sustainable infrastructure investment and development. 6. To ensure the financial sustainability of the municipality is in order and to adhere to statutory requirements. 7. To promote good governance through enhanced stakeholder participation. 8. To provide an effective and efficient resources by aligning our institutional arrangements to our overall strategy in order to deliver quality services 9. To facilitate the development of the community pro-active identification prevention, mitigation and fire disaster risks. 10. Create a conducive environment for economic development in the municipality. <p>Electrification remains a challenge due to continuous growth of informal settlements and lack of funding within the Gamagara LM and the following opportunities stands to be undertaken to address the challenges:</p> <ol style="list-style-type: none"> 11. The municipality is located near Solar Farms and the possibility of being provided with electricity directly instead of from Eskom needs to be investigated. The supply at night is however still a problem. 12. Request more funds or assistance from external funders like mines, solar farms, government departments to speed up planned projects. 13. Possibility of handover of the Ditslout Electrical network in Olifantshoek by Eskom to Gamagara municipality to implement proper credit controls 14. New 132Kv intake substation and line be funded by Department of Energy. 15. Electrification of stands within the Municipal area.

Relevant policy	Relevance to San Solar PV facility
	<p>The implementation of San Solar PV facility would contribute towards supporting the Gamagara LM vision specifically towards local economic development and addressing the key issues regarding electricity. In addition, the REIPPP Programme requires preferred bidders to make minimum contributions towards local economic development and social upliftment, to be focused on benefitting local communities within the vicinity of the project site.</p>

CHAPTER 4: NEED AND DESIRABILITY & ALTERNATIVES

Appendix 2 of the 2014 EIA Regulations (GNR 326) requires that a Scoping Report includes a motivation for the need and desirability of the proposed development, including the need and desirability of the activity in the context of the preferred location. The need and desirability of the development needs to consider whether it is the right time and the right place for locating the type of land-use/activity being proposed. The need and desirability of a proposed development is, therefore, associated with the wise use of land, and should be able to respond to the question such as, but not limited to, what the most sustainable use of the land may be.

This Chapter provides an overview of the suitability of the San Solar PV facility being developed at the preferred project location from an international, national, regional, and site-specific perspective. It provides an overview of the need and desirability, and perceived benefits of the project specifically. This Chapter provides an overview of the various alternatives considered for San Solar PV facility as part of the Scoping Process.

4.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of an Impact Assessment Report

This chapter includes the following information required in terms of Appendix 2: Content of a Scoping report:

Requirement	Relevant Section
(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;	The need and desirability for the development of San Solar PV facility is included and discussed within this chapter. The need and desirability for the development of the PV facility has been considered from an international, national, regional and site-specific perspective.
(g)(i) details of all the alternatives considered	The details of the alternatives considered as part of San Solar PV facility and as part of the Scoping Phase have been included in Section 4.7 .
(g)(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such	The details of the alternatives considered as part of San Solar PV facility and as part of the Scoping Phase have been included in Section 4.7 . Where no alternatives are being considered a motivation has been included.

4.2 Need and Desirability from an International Perspective

The need and desirability of San Solar PV facility, from an international perspective, can be described through the project's alignment with internationally recognised and adopted agreements, protocols and conventions. South Africa is a signatory to a number of international treaties and initiatives, including the United Nation's Development Programme's (UNDP's) Sustainable Development Goals (SDGs). The SDGs address global socio-economic challenges such as poverty, hunger, health, education, climate change, gender equality, water, sanitation, energy, urbanisation, environment and social justice. The SDGs consist of 17 global goals set by the United Nations. The 17 SDGs are characterised by 169 targets, and 304 indicators.

Goal 7 of the SDGs relates to "Affordable and Clean Energy", with the aim of the goal being to ensure access to affordable, reliable, sustainable and modern energy for all. The following targets and indicators have been set for Goal 7:

Targets	Indicators
7.1 By 2030, ensure universal access to affordable, reliable and modern energy services.	7.1.1 Proportion of population with access to electricity. 7.1.2 Proportion of population with primary reliance on clean fuels and technology.
7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.	7.2.1 Renewable energy share in the total final energy consumption.
7.3 By 2030, double the global rate of improvement in energy efficiency.	7.3.1 Energy intensity measured in terms of primary energy and GDP.
7.A By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology.	7.A.1 Mobilised amount of United States dollars per year starting in 2020 accountable towards the \$100 billion commitment.
7.B By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support.	7.B.1 Investments in energy efficiency as a percentage of GDP and the amount of foreign direct investment in financial transfer for infrastructure and technology to sustainable development services.

The development of San Solar PV facility would contribute positively towards Goal 7 of the SDGs through the following:

- » By generating up to 100MW_{AC} of affordable and clean energy.
 - * A study published by the CSIR on 14 October 2016 ("Cost of new power generators in South Africa Comparative analysis based on recent Independent Power Producer (IPP) announcements", Dr Tobias Bischof-Niemz and Ruan Fourie) which took into consideration the results of the cost prices bid successfully under the Department of Mineral Resources and Energy's Renewable Energy (RE) IPP and Coal Baseload IPP Procurement Programmes, found that solar PV and wind were 40% cheaper than new baseload coal (i.e. R0.62/kWh for PV and wind vs R1.03 for coal).
 - * PV technology is one of the cleanest electricity generation technologies, as it does not result in the release of emissions during its operation.
- » By contributing towards South Africa's total generation capacity, specifically through the utilisation of renewable energy resources.

4.3 Need and Desirability from a National Perspective

- » From a national perspective, the need and desirability of the San Solar PV facility can largely be linked from the project's alignment with national government policies, plans, and programmes which have relevance to energy planning and production (as discussed in detail in **Chapter 3**). The following key plans have been developed by National Government to consider South Africa's current energy

production, projected future demands, and provides the necessary framework within which energy generation projects can be developed:

- » Integrated Energy Plan (IEP)
- » Integrated Resource Plan (IRP)

The above-mentioned energy plans have been extensively researched and are updated on an on-going basis to take into consideration changing scenarios, new information, developments in new technologies, and to reflect updated demands and requirements for energy production within the South African context. These plans form the basis of South Africa's energy generation sector and dictate national priorities for energy production.

The IEP is intended to provide a roadmap of South Africa's future energy landscape and guide future energy infrastructure investments and policy development. The Plan considered the three pillars of sustainable development, and list the following as the eight key energy planning objectives:

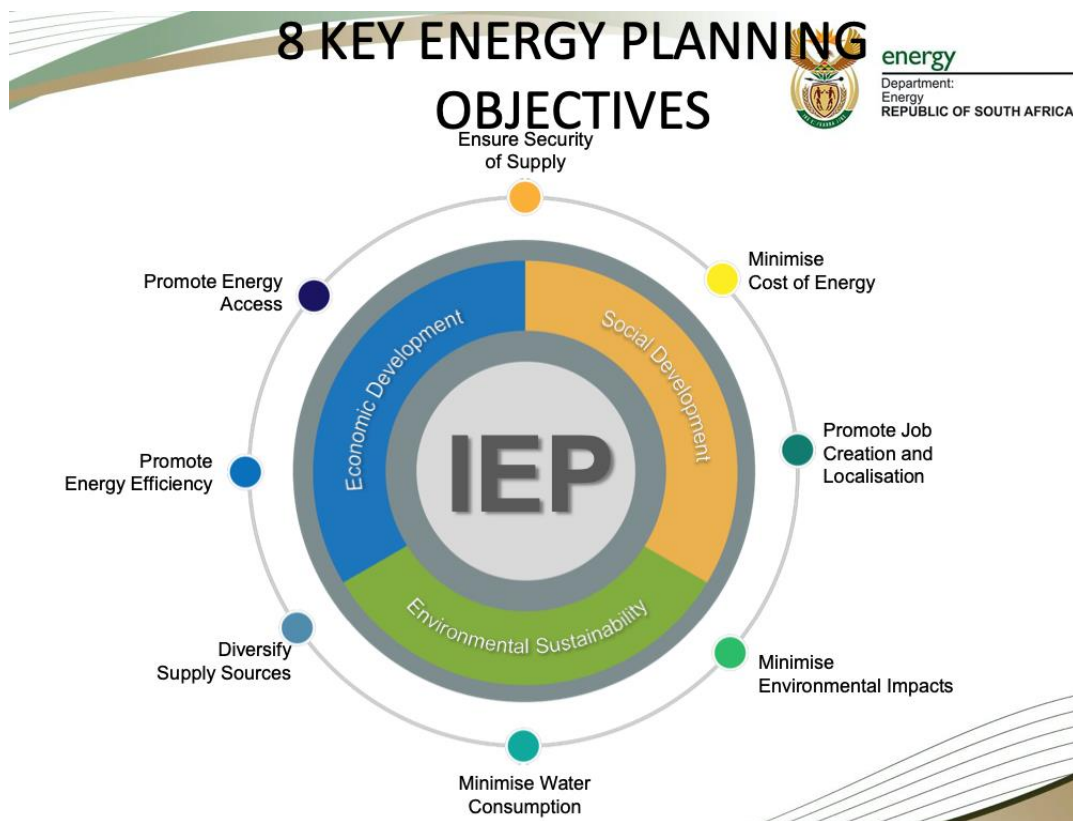


Figure 4.1: Eight key energy objectives as listed in the IEP, 2016 (extract from DOE presentation, December 2016)

The latest iteration of the IEP (25 November 2016) contained the following statement regarding solar power in South Africa:

“South Africa experiences some of the highest levels of solar radiation in the world and this renewable resource holds great potential for the country. The daily solar radiation in South Africa varies between 4.5 and 6.5 kilowatt hours per square meter (kWh/m²) (16 and 23 mega joules per square meter [MJ/m²])

(Stassen, 1996), compared to about 3.6 kWh/m² in parts of the United States and about 2.5 kWh/m² in Europe and the United Kingdom. The total area of high radiation in South Africa amounts to approximately 194 000 km², including the Northern Cape, which is one of the best solar resource areas in the world. With electricity production per square kilometre of mirror surface in a solar thermal power station being 30.2 MW, and just 1% of the high radiation area in the country being made available for solar power generation, the generation potential is approximately 64 GW. Solar energy has the potential to contribute quite substantially to South Africa's future energy needs. This would, however, require large investments in transmission lines from the areas of high radiation to the main electricity consumer centres."

In terms of electricity generation, the IEP states that South Africa should continue to pursue a diversified energy mix which reduces reliance on a single or a few primary energy sources, and includes the following statement regarding solar energy's contribution to the diversified energy mix:

- » Solar should play a much more significant role in the electricity generation mix than it has done historically and constitutes the greatest share of primary energy (in terms of total installed capacity) by 2050. The contribution of solar in the energy mix comprises both CSP and solar PV. Solar PV includes large scale installations for power generation which supply to the grid and individual, off-grid solar home systems and rooftop panels.
- » Several interventions which could enhance the future solar energy landscape are recommended as follows: –Large scale CSP projects with proven thermal storage technologies and hybridisation / industrial steam application projects should be incentivised in the short to medium term. In the long term, the existing incentives could be extended to promote locally developed CSP technology storage solutions and large-scale solar fuel projects.
- » A thorough solar resource assessment for South Africa should continue to be undertaken in the North West Province and extended to other provinces deemed to have high solar radiation levels.
- » Investments should be made to upgrade the grid in order to accommodate increasing solar and other renewable energy contributions.

The Integrated Resource Plan 2019 is South Africa's current gazetted energy plan. The purpose of the plan is to ensure sustainable electricity development which takes into consideration technical, economic, and social constraints, and identifies investments in the electricity sector which are required to meet the country's forecasted electricity demands at minimum costs. The consideration of GHG emissions in the determination of the energy generation mix indicates government's commitment to international obligations under the Paris Agreement.

A number of IPP Procurement Programmes have been initiated to secure electricity generated from a range of resources from the private sector (i.e. from Independent Power Producers, or IPPs). Provision has been made for new additional capacities in the IRP 2019 (refer to **Table 4.1**).

Table 4.1: Overview of the total installed capacity expected by 2030

IPP Procurement Programme	Technology	MW	Total
Renewables	Wind	17 742MW	31 320MW
	Solar CSP	600MW	
	Solar Photovoltaic	8 288MW	
	Hydro	4 600MW	
Coal	Coal	33 364MW	33 364MW
Nuclear	Nuclear	1 860MW	1 860MW

Gas & Diesel	Gas & Diesel	3 000MW	3 000MW
Other (Distributed Generation, CoGen, Biomass, Landfill)	Other (Distributed Generation, CoGen, Biomass, Landfill)	4 000MW	4 000MW

Renewable resources are valuable in contributing towards electricity generation and diversifying South Africa's electricity mix, while contributing towards South Africa's response to Climate Change. Under the REIPPPP, the DMRE intends to secure 14 725MW of electricity from renewable energy generation facilities utilising either onshore wind, concentrated solar thermal, solar photovoltaic (PV), biomass, biogas, landfill gas, or hydro across a number of bidding windows, while simultaneously contributing towards socio-economic development. A total of 1 474MW⁸ of PV generated electricity has been awarded to preferred bidders across four (4) rounds of bidding to date, with 814MW still remaining to be allocated in subsequent bidding rounds. Preferred bidders identified under any IPP Procurement Programme, including the REIPPPP, are required to satisfy a number of economic development requirements, including amongst others, job creation, local content, skills development, enterprise and supplier development, and socio-economic development. In addition to electricity generation and supply, IPP Procurement Programmes also contribute positively towards socio-economic development of a region, over and above job creation.

In addition to the policy considerations detailed above, Government has prioritised post COVID-19 turnaround plans in terms of renewable energies within the Just Energy Transition (JET), coupled with key development objectives of the various spheres of government. These policies share the same ideals, such as:

- » The utilisation, application and investment in renewable energy resources in South Africa is considered to be an essential means of reducing the carbon footprint of the country,
- » Diversifying the national economy,
- » Reducing poverty, and
- » Providing critical additional energy to that provided by Eskom.

Government has compiled an Economic Reconstruction and Recovery Plan which was presented to Parliament in October 2020. According to this plan, the economic survey will rely on a massive investment in infrastructure, including energy, telecommunications, ports and rail. The core elements of the Economic Reconstruction and Recovery Plan are as follows:

- » Priority interventions for economic recovery: the plan sets out eight priority interventions that will ignite South Africa's recovery and reconstruction effort. These are the flagship initiatives that all of society will rally around to build a new economy (refer to **Figure 4.2**).
- » Enabling conditions for growth: these are growth-enhancing reforms and other preconditions for an inclusive, competitive and growing economy.
- » Macroeconomic framework: economic reconstruction and recovery requires careful mobilisation of resources to ensure fiscal sustainability.
- » Institutional arrangements: the plan focuses on execution and is supported by enhanced institutional arrangements to ensure implementation and accountability.

⁸ <https://www.cliffedekkerhofmeyr.com/en/news/publications/2019/Corporate/energy-alert-22-october-The-Integrated-Resource-Plan-2019-A-promising-future-roadmap-for-generation-capacity-in-South-Africa.html>

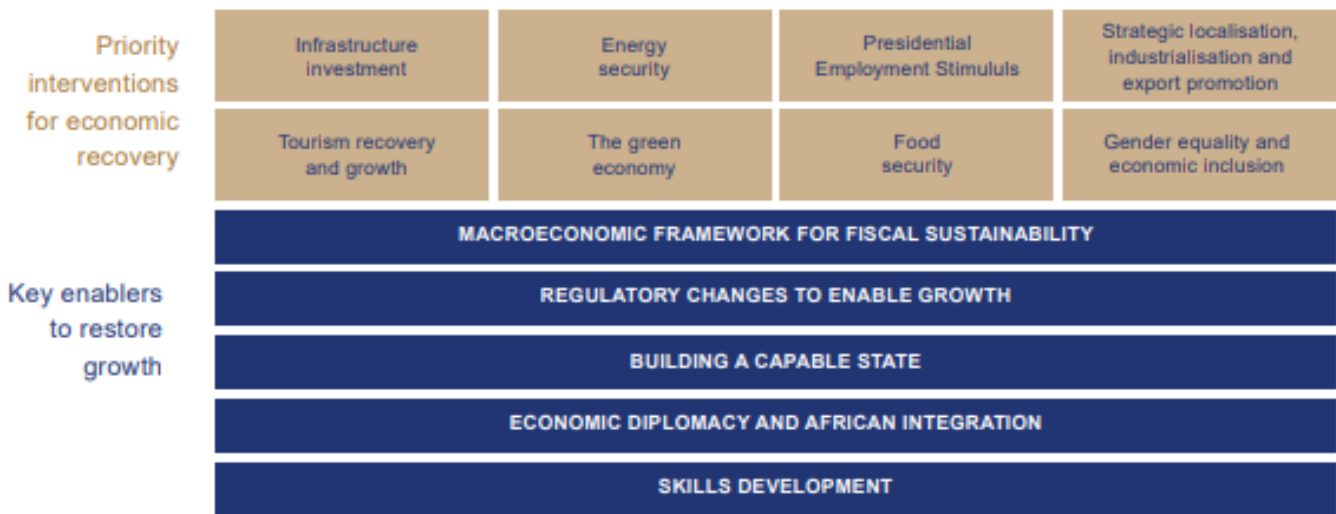


Figure 4.2: Core elements of the Economic Reconstruction and Recovery Plan (source: Building a new economy - Highlights of the Reconstruction and Recovery Plan, Presidency of the Republic of South Africa)

The plan recognises energy security as the most important prerequisite for the recovery agenda and states that renewed investment in a diversified energy mix can be achieved within a short time horizon, while alleviating a crippling energy crisis and facilitating a necessary transition to a less carbon-intensive economy. One of the key commitments of the plan is, therefore, to implement the IRP 2019 without delay to provide a substantial increase in the contribution of renewable energy sources by 2030, alongside other sources including battery storage, gas and clean coal. The transition to green energy is recognised as contributing towards the realisation of the low-carbon, climate-resilient and inclusive economy envisaged by the National Development Plan. The development of PV1 is identified as a mechanism for securing additional power generation capacity as part of the REIPPP programme or for private off-takers, reducing the reliance for electricity on Eskom.

The need for new power generation from solar PV facilities has been identified and assessed by government at a national scale considering the national energy requirements as well as international commitments under the Paris Agreement; therefore, provision has been made for the inclusion of new PV power generation capacity in South Africa's energy mix. The implementation of San Solar PV facility has the potential to contribute positively towards the identified need, while simultaneously contributing to job creation and socio-economic development, identified as a need for the country within the National Development Plan (NDP).

San Solar PV facility will make use of renewable energy technology and would contribute positively towards reducing South Africa's GHG emissions and ensure compliance with all applicable legislation and permitting requirements. In addition, by making use of PV technology, San Solar PV facility would have reduced water requirements when compared with some other generation technologies in alignment with one of the vision 2030 themes of the then-Department of Water and Sanitation's (now the Department of Human Settlements, Water and Sanitation) National Water Resource Strategy 2 (2013) (i.e. transitioning to a low carbon economy through stimulating renewable energy and retrofitting buildings).

4.4 Need and Desirability of the project from a Regional Perspective

South Africa's electricity generation mix has historically been dominated by coal. However, up to 2030 a new capacity demand will be driven by the decommissioning of existing coal-fired power stations. A further 24 100MW (Figure 4.3) of coal power is expected to be decommissioned in the period 2030 to 2050. Therefore, additional capacity will be required from renewable energy sources, particularly solar with 6 000MW being allocated for the period up to 2030.



Figure 4.3: A snapshot of the updated Energy Mix as per the IRP 2019

Although the majority of South Africa's electricity generation infrastructure (coal-fired power stations) is currently located within Mpumalanga due to the location of coal resources within this province, the Northern Cape Province has been identified as an area where electricity generation from solar energy facilities is highly feasible and a viable option. The location of the study area and project site within the Northern Cape is therefore considered to support the Province/Region's generation targets. The Kathu area is also considered as a hub for the development of solar energy projects due to the viability of the solar resource for the area and the number of projects proposed in the area.

The overarching objective for the solar energy facility is to maximise electricity production through exposure to the solar resource, while minimising infrastructure, operational and maintenance costs, as well as social and environmental impacts. From a regional site selection perspective, this region is considered to be preferred for solar energy development by virtue of its annual solar irradiation values. The GHI for the area derived from the World Bank Group's Global Solar Atlas is approximately 2 240 kWh/m²/annum, equivalent to the highest GHI values in the country (refer to Figure 4.4).

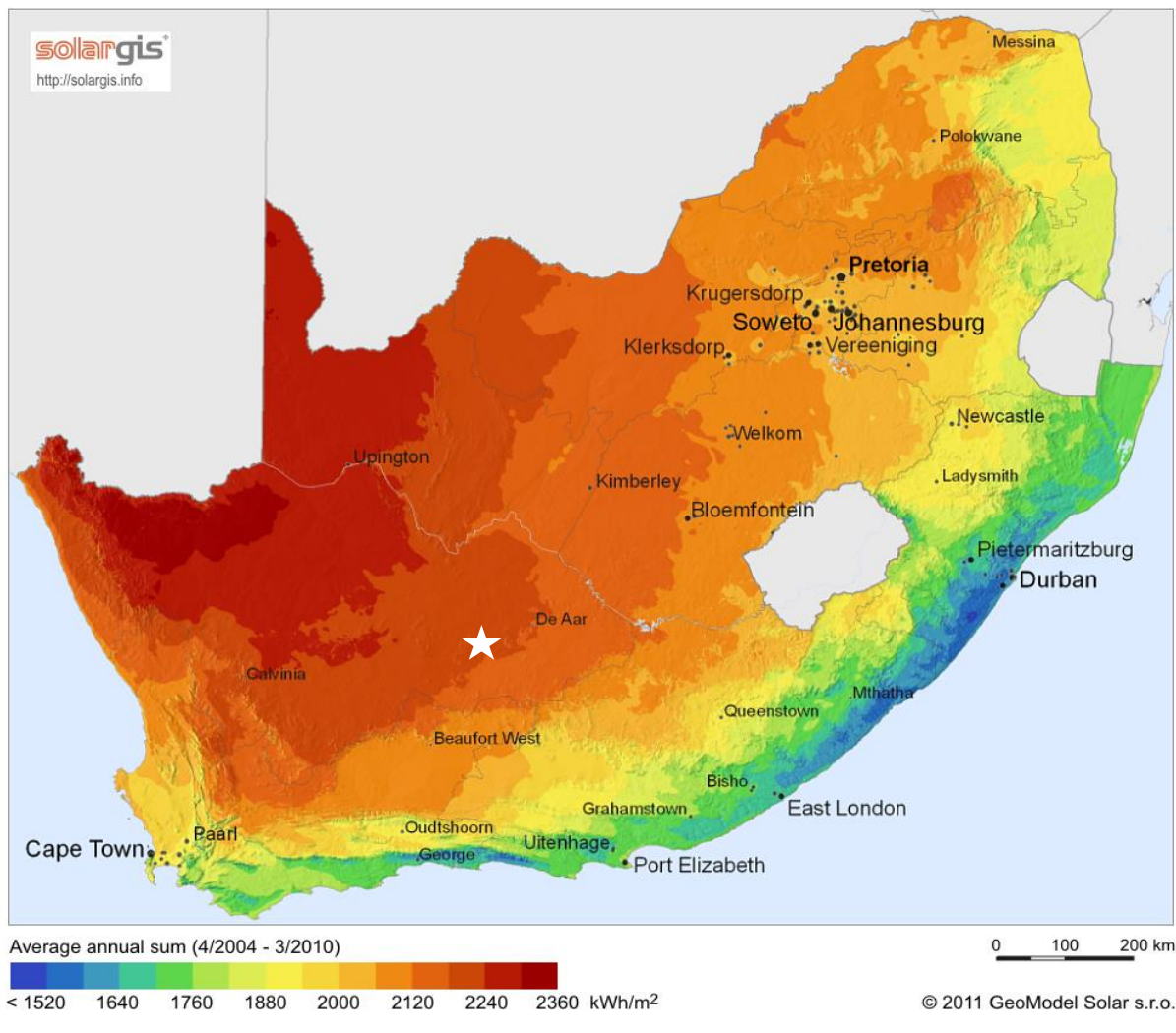


Figure 4.4: Solar irradiation map for South Africa, with the position of San Solar PV shown by the white star (Source: GeoModel Solar)

4.5 Receptiveness of the proposed development area for the establishment of San Solar PV

The placement of a solar PV facility is strongly dependent on several factors including climatic conditions (solar irradiation levels), topography, the location of the site, and in particular the location in a node for renewable projects, availability of grid connection, the extent of the site and the need and desirability for the project. From a local level perspective, the project site and development area have specifically been identified by the proponent as being highly desirable from a technical perspective for the development of a solar PV facility due to the following site characteristics:

- » **Solar resource:** The economic viability of a solar PV facility is directly dependent on the annual direct solar irradiation values. The Global Horizontal Irradiation (GHI) for this geographic location is in the region of approximately 2 240 kWh/m²/annum, which is considered favourable for the development of a solar PV facility.
- » **Topography:** Sites that facilitate easy construction conditions, (i.e. relatively flat topography, lack of major rock outcrops, limited watercourse crossings, etc.) are favoured by developers during the site

selection process. As a result, the development area for San Solar PV consists of a flat gently undulating topography, and with an average elevation of ~1105m in the north-west to 1195m in the south-east of the project site. There are no prominent hills within the project site. These characteristics are preferred for the development of a solar PV facility as construction efforts and costs are minimised, and therefore the study area is considered to be preferable and acceptable for the development of San Solar PV.

- » **Site extent and land availability:** Availability of relatively level land of sufficient extent can be a restraining factor to PV development, as a 100MW solar PV development and associated infrastructure requires sufficient land space. The total extent of the property (being 991.5ha) which is owned by the applicant is considered to be sufficient for the planned 100MW PV facility and provides an opportunity for the avoidance of sensitive environmental features and areas.
- » **Access to road infrastructure and site access:** The area in which the project site is located can be readily accessed via the R380 Regional Road which branches off the N14 National Road, approximately 3km south of Kathu. The Sishen Airport lies along the R380. As material and components would need to be transported to the development area during the construction phase, accessibility to the project site is a key factor in determining the viability of San Solar PV facility, particularly taking transportation costs (direct and indirect) into consideration and the impact of this on the project economics.
- » **Grid access:** A key factor in the siting of any solar PV facility is that the project must have a viable grid connection in order to evacuate the generated electricity to the national grid. San Solar PV facility is intended to connect to the National Grid via a loop-in and loop out (LILLO) to the Fox-Umtu 132kV overhead power line located south east of the site. Having a grid connection point in close proximity to the project site reduces the necessary grid infrastructure and therefore addresses Eskom's concerns for lower cost connection alternatives. A shorter grid solution will also ensure that potential environmental impacts are kept to a minimum.
- » **Land suitability and land use activities:** The current land use of the development area is an important consideration in site selection in terms of limiting disruption to existing land use practices. The Applicant is the owner of the property/project site. The property has been owned since 2015, and the current land use is grazing (through a lease with a third party). The site is also adjacent to other solar PV facilities, collectively forming a renewable energy node in this area north of Kathu. Three (3) solar facilities have been constructed in the broader area. These include the Sishen Solar PV and Kathu Solar PV facilities located immediately west of the farm Remaining extent of the Farm Wincanton 472. The Kathu Solar facility is a CSP facility located to the east of the study area.
- » **Land availability:** The selection of a site where the landowner is supportive of the development of renewable energy is essential for ensuring the success of the project. The applicant is the landowner of the Farm Wincanton 472 and has held the property since 2015.

Taking into consideration the solar resource, grid access, land suitability, the fact that the applicant owns the land in which the PV facility is to be placed, access to road infrastructure, the current land use, in conjunction with other solar facilities including the Sishen Solar PV, Kathu Solar PV and the Kathu CSP facility that have been constructed within the vicinity of the project site., the development of San Solar PV is therefore considered to be desirable and will ultimately contribute to, and further develop the successful power generation activities already being undertaken within the area.

Therefore, the development of San Solar PV within the project site and development area is considered to be desirable considering the characteristics of the area.

4.6 Benefits of Renewable Energy and the Need and Desirability

The generation of electricity from renewable energy resources offers a range of potential socio-economic and environmental benefits for South Africa; these include:

Socio-economic upliftment of local communities: San Solar PV has the potential to create much needed employment for unskilled locals during the construction phase. Training opportunities will also be afforded to qualified local people who can be upskilled to undertake certain roles during the construction and operation phases. In terms of the needs of the local community, the Local and District municipality IDPs identified the need to facilitate economic development by creating an environment that is conducive for business development, economic growth, sustainable employment opportunities and growth in personal income levels of communities; unlock opportunities to increase participation amongst all sectors of society in the mainstream economy to create decent job opportunities; promote Local Economic Development; and enhance rural development and agriculture. A study undertaken by the Department of Mineral Resource and Energy (DMRE), National Treasury and the Development Bank of Southern Africa (DBSA) in June 2017 found that employment opportunities created during the construction phase of the projects implemented to date had created 40% more jobs for South African citizens than anticipated. The study also found that significantly more people from local communities were employed during construction than was initially planned, confirming the potential benefits for local communities associated with the implementation of renewable energy projects.

Increased energy security: Given that renewables can often be deployed in a short timeframe and in a decentralised manner close to consumers, they offer the opportunity for improving grid strength and supply quality in the short-term, while reducing expensive distribution losses. As a result of the power constraints in the first half of 2015, power generators meant to be the "barely-ever-used" safety net for the system (diesel-fired gas turbines) were running at >30% average load factor in the first half of 2015. Load shedding occurred during 82 days in the first half of 2015 (out of 181 days). Results of a CSIR Energy Centre study for the period January to June 2015 (CSIR, August 2015), concluded that the already implemented renewable projects (wind and solar) within the country avoided 203 hours of so-called 'unserved energy'. During these hours the supply situation was such that some customers' energy supply would have had to be curtailed ('unserved') had it not been for the renewables. The avoidance of unserved energy cumulated into the effect that for 15 days, from January to June 2015, load shedding was avoided entirely, delayed, or a higher stage of load shedding prevented due to the contribution of renewable wind and PV projects⁹. More recently, power generated from renewable energy sources have assisted Eskom in alleviating the need for rolling blackouts when aging power stations have been offline for maintenance.

Resource saving: It is estimated that the achievement of the targets in the Renewable Energy White Paper will result in water savings of approximately 16.5 million kilolitres per annum. As an already water-stressed nation, it is critical that South Africa engages in a variety of water conservation measures, particularly due to the detrimental effects of climate change on water availability. Renewable energy also translates into revenue savings, as fuel for renewable energy facilities is free, while compared to the continual purchase of fuel for conventional power stations.

⁹ (http://ntww1.csir.co.za/plsql/ptl0002/PTL0002_PGE157_MEDIA_REL?MEDIA_RELEASE_NO=7526896)

2015 (6 months)	2014 (12 months)
R3.60 billion saving in diesel and coal fuel costs	R3.64 billion saving in diesel and coal fuel costs
200 hours of unserved energy avoided, saving at least an additional R1.20 billion–R4.60 billion for the economy	120 hours of unserved energy avoided, saving at least an additional R1.67 billion for the economy
Generated R4.0 billion more financial benefits than cost	Generated R0.8 billion more financial benefits than cost

Exploitation of significant renewable energy resource: At present, valuable renewable resources including biomass by-products, solar irradiation and wind power remain largely unexploited. The use of these energy flows will strengthen energy security through the development of a diverse energy portfolio in South Africa.

Economics: As a result of the available renewable energy resources and the competitive renewable energy procurement process, both wind power and solar PV power have now been proven as cheaper forms of energy generation in South Africa than fossil fuel (coal) generated power. The IRP 2019 gazetted by the Minister of Mineral Resources and Energy in October 2019, updates the energy forecast for South Africa from the current period until the year 2030 and has made an allocation of 6000MW in addition to the already installed/committed capacity of 2 288MW from solar PV facilities which will be developed from 2022 – 2030.

Pollution reduction: The release of by-products through the burning of fossil fuels for electricity generation have a particularly hazardous impact on human health and contribute to ecosystem degradation. The use of solar irradiation or wind for power generation is a non-consumptive use of a natural resource which produces zero emissions during its operation.

Climate friendly development: The uptake of renewable energy offers the opportunity to address energy needs in an environmentally responsible manner and thereby allows South Africa to contribute towards mitigating climate change through the reduction of GHG emissions. South Africa is estimated to currently be responsible for approximately 1% of global GHG emissions (and circa half of those for which Africa is responsible) and is currently ranked 9th worldwide in terms of per capita carbon dioxide emissions. Since its inception, the REIPPPP has achieved carbon emission reductions¹⁰ of 25.3 million tonnes of CO₂ (IPP Office, March 2018). The development of San Solar PV, and the associated electricity generated as a result of the facility, will result in considerable savings on tons of CO₂ emissions.

Support for international agreements: The effective deployment of renewable energy provides a tangible means for South Africa to demonstrate its commitment to its international agreements under and for cementing its status as a leading player within the international community.

Employment creation: The development, procurement, installation, maintenance and management of renewable energy facilities have significant potential for job creation and skills development in South Africa. In the short period, the REIPPPP has attracted R209.4 billion in committed private sector investment, resulting in 38 701 jobs for the youth and women from surrounding communities¹¹.

¹⁰ Carbon emission reduction is calculated based on a displacement of power, from largely coal-based to more environmentally friendly electrical energy generation, using a gross Eskom equivalent emissions factor of 1.015 tons CO₂/MWh.

¹¹ <https://www.sanews.gov.za/south-africa/renewable-energy-programme-attracts-r2094-billion-sa-economy>

Acceptability to society: Renewable energy offers a number of tangible benefits to society including reduced pollution concerns, improved human and ecosystem health and climate friendly development.

Support to a new industry sector: The development of renewable energy offers the opportunity to establish a new industry within the South African economy, which will create jobs and skill local communities which have potential for further renewable energy projects.

Protecting the natural foundations of life for future generations: Actions to reduce our disproportionate carbon footprint can play an important part in ensuring our role in preventing dangerous anthropogenic climate change, thereby securing the natural foundations of life for generations to come; this is the basis of sustainable development. The development of renewable energy facilities contributes to the protection of the foundations.

4.7 Alternatives Considered during the EIA Process

In accordance with the requirements of Appendix 2 of the 2014 Environmental Impact Assessment (EIA) Regulations (GNR 326), reasonable and feasible alternatives including but not limited to site and technology alternatives, as well as the “do-nothing” alternative should be considered. Several other solar renewable energy facilities are planned within the broader study area, supporting the suitability of the area for solar PV projects.

The DFFE Guideline for determining alternatives states that the key criteria for consideration when identifying alternatives are that they should be “practicable”, “feasible”, “relevant”, “reasonable” and “viable”. Essentially there are two types of alternatives:

- » Incrementally different (modifications) alternatives to the project.
- » Fundamentally (totally) different alternatives to the project.

In this instance, 'the project' refers to San Solar PV, a solar PV facility with capacity of up to 100MW_{AC} and associated infrastructure proposed to be developed by an Independent Power Producer (IPP) and intended to form part of the DMRE's REIPPP Programme.

4.7.1 Consideration of Fundamentally Different Alternatives

Fundamentally different alternatives are usually assessed at a strategic level and, as a result, project specific EIAs are therefore limited in scope and ability to address fundamentally different alternatives. At a strategic level, electricity generating alternatives have been addressed as part of the DMRE's current Integrated Resource Plan for Electricity 2010 – 2030 (IRP)¹², and will continue to be addressed as part of future revisions. In this regard, the need for renewable energy power generation from solar PV facilities has been identified as part of the technology mix for power generation in the country for the next 20 years. Therefore, fundamentally different alternatives to the proposed project are not considered within this EIA process.

4.7.2 Consideration of Incrementally Different Alternatives

¹² The Integrated Resource Plan (IRP) is legislated policy which regulates power generation planning.

Incrementally different alternatives relate specifically to the project under investigation. "Alternatives", in relation to a proposed activity, means different ways of meeting the general purposes and requirements of the activity, which may include alternatives for:

- » The property on which, or location where the activity is proposed to be undertaken.
- » The type of activity to be undertaken.
- » The design or layout of the activity.
- » The technology to be used in the activity.
- » The operational aspects of the activity.

In addition, the option of not implementing the activity (i.e. the "do-nothing" alternative) must also be considered.

These alternatives are discussed under the respective sub-headings below and where no alternatives are applicable, a motivation has been included.

i. Property or Location Alternatives

The placement of a solar PV facility is dependent on several other factors including land suitability, climatic conditions (solar irradiation levels), topography, the location and extent of the study area, availability of grid connection infrastructure and the need and desirability of the project. San Solar PV (Pty) Ltd as the Applicant as well as the landowner considers the preferred development area placed within the study area as being highly favourable and suitable for the establishment of a solar PV facility. The project site was previously authorised for the development of a 75MW PV project, also known as the San Solar PV project. This application for Environmental Authorisation is considered on the same property which contributes to the selection of the project site for the development of a solar PV energy facility.

ii. Design and Layout Alternatives

A project site consisting of the Remaining extent of the Farm Wincanton 472 (991,5ha in extent) is being considered for the San Solar PV facility. Findings from specialist desktop assessments and field survey undertaken for the avifauna monitoring survey were considered through this Scoping process in order to provide site specific information regarding the project site considered for the San Solar PV facility.

Areas to be avoided that will be identified during the scoping phase, specifically relating to ecological and sensitivities present within the project site will be utilised as a tool by the developer to identify and locate the development area for the 100MW PV facility. This will be undertaken with the aim of avoiding possible sensitive areas within the project site so as to limit impacts associated with the development which would result in unacceptable loss.

The site extent of 991.5ha is sufficient for the proposed development area (400ha), and therefore reduces the need to consider alternative locations for the PV facility and the associated infrastructure. Potential environmentally sensitive areas have been identified as part of the Scoping Phase (refer to Chapter 8) for further detailed consideration during the EIA Phase.

4.7.3 Technology Alternatives

The Kathu area has been identified for the development of solar and wind energy renewable facilities. Few technology options are available for solar facilities, and the use of those that are considered are usually differentiated by weather and temperature conditions that prevail in the area, so that optimality is obtained by the final site selection. Solar energy is considered to be the most suitable renewable energy technology for this area, based on the site location, ambient conditions and energy resource availability.

Solar PV was determined as the most suitable option for further assessment. The IRP (2019) excludes the procurement of power from CSP facilities until 2030, whereas new additional capacity of approximately 6 000MW will be required from solar PV facilities. Therefore, PV technology was identified as being the preferred option for the study area and consists of a lower visual profile and limited water requirements when compared to the CSP technology alternative. Given the allocations in the IRP (2019), solar PV is considered as the most appropriate technology option. Furthermore, the development of San Solar PV facility provides an opportunity to optimally use a site that was previously earmarked for energy generation through making use of solar PV technology (with projects previously authorised on this footprint).

Therefore, considering the above, no other technology alternatives are being assessed for the development of San Solar PV facility. When considering PV as a technology choice, several types of panels are available, including *inter alia*:

- » Bifacial PV panels
- » Monofacial PV panels
- » Fixed mounted PV systems (static / fixed-tilt panels).
- » Single-axis tracking or double-axis tracking systems (with solar panels that rotate around a defined axis to follow the sun's movement).

The primary difference between PV technologies available relate to the extent of the facility, as well as the height of the facility (visual impacts), however the potential for environmental impacts remain similar in magnitude. Fixed mounted PV systems are able to occupy a smaller extent and have a lower height when compared to tracking PV systems, which require both a larger extent of land, and are taller in height. However, both options are considered to be acceptable for implementation from an environmental perspective. Bifacial solar PV panels offer many advantages over monofacial PV panels, as power can be produced on both sides of the module, increasing total energy generation. The preference will therefore be determined on the basis of technical considerations and the site conditions.

The PV panels are designed to operate continuously for more than 20 years, mostly unattended and with low maintenance. The impacts associated with the construction, operation, and decommissioning of the facility are anticipated to be the same irrespective of the PV panel selected for implementation.

4.7.4 The 'Do-Nothing' Alternative

The 'Do-Nothing' alternative is the option of not constructing San Solar PV facility. Should this alternative be selected, there would be no environmental impacts or benefits as a result of construction and operation activities associated with a solar PV facility. The 'do-nothing' alternative will therefore likely result in minimising the cumulative impact on the land, although it is expected that pressure to develop the site for renewable energy purposes will be actively pursued due to the same factors which make the site a viable option for renewable energy development. This alternative will be assessed within the EIA Phase of the process.

CHAPTER 5: APPROACH TO UNDERTAKING SCOPING PHASE

In terms of the EIA Regulations of December 2014 (as amended) published in terms of the NEMA (Act No. 107 of 1998) as amended, the construction and operation of San Solar PV is a listed activity requiring Environmental Authorisation (EA). The application for EA is required to be supported by an Environmental Impact Assessment (EIA) process based on the contracted capacity of the facility being 100MW and Activity 1 of Listing Notice 2 (GNR 325).

An EIA process refers to the process undertaken in accordance with the requirements of the relevant EIA Regulations (the 2014 EIA Regulations (GNR 326), as amended), which involves the identification and assessment of direct, indirect, and cumulative environmental impacts associated with a proposed project or activity. The EIA process comprises two main phases: i.e. **Scoping** and **EIA Phase**.

South Africa is subject to the enforcement of Government Gazette 43096 which places the country in a national state of disaster limiting the movement of people to curb the spread of the COVID-19 virus. Considering the limitations in place, a comprehensive consultation process was designed and implemented to cater for the undertaking of a full-scale, innovative public participation process (PPP) which included I&APs, the competent authority, directly impacted landowners/occupiers, adjacent landowners/occupiers, relevant Organs of State departments, ward councillors and other key stakeholders, while remaining within the limits as stipulated by the National Government. This chapter outlines the process that was followed during the Scoping Phase of the EIA process.

The EIA process is illustrated in **Figure 5.1**.



Figure 5.1: The Phases of an Environmental Impact Assessment (EIA) Process

5.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of an Impact Assessment Report

This chapter includes the following information required in terms of Appendix 2: Content of a Scoping report:

Requirement	Relevant Section
(d)(i) a description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for and (ii) a description of the activities to be undertaken, including associated structures and infrastructure.	All listed activities triggered and applied for are included in Section 5.2 .
(g)(ii) details of the PPP undertaken in terms of Regulation 41 of the Regulations, including copies of the supporting documents and inputs.	The PPP followed throughout the EIA process for San Solar PV is included in Section 5.5.2 and copies of the supporting documents and inputs are included in Appendix C .
(g)(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.	Comments raised through the undertaking of the PPP including consultation with I&APs will be included in the Comments and Responses Report in Appendix C .
(g)(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;	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 are included in Section 5.5.3 .

5.2 Relevant legislative permitting requirements

The legislative permitting requirements applicable to San Solar PV facility, as identified at this stage in the process and considered within this EIA process, are described in more detail under the respective sub-headings. Relevant permitting requirements are detailed within **Table 5.5**.

5.2.1 National Environmental Management Act (No. 107 of 1998) (NEMA)

NEMA (No. 107 of 1998) is South Africa's key piece of national environmental legislation that provides for the authorisation of certain controlled activities known as "listed activities". In terms of Section 24(1) of NEMA, the potential impact on the environment associated with listed activities must be considered, investigated, assessed and reported on to the Competent Authority (the decision-maker) charged by NEMA with granting of the relevant Environmental Authorisation (EA). Due to the fact that San Solar PV facility is a power generation project and therefore may relate to the IRP for Electricity 2010 – 2030, the National Department of Forestry, Fisheries and the Environment (DFFE) has been determined as the Competent Authority (CA) in terms of GNR 779 of 01 July 2016. The Provincial authority, the Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAEARD & LR) is a Commenting Authority on the project.

The need to comply with the requirements of the EIA Regulations published under NEMA ensures that developers are provided the opportunity to consider the potential environmental impacts of their activities early in the project development process, and also allows for an assessment to be made as to whether environmental impacts can be avoided, minimised or mitigated to acceptable levels. Comprehensive, independent environmental studies are required to be undertaken in accordance with the EIA Regulations to provide the Competent Authority with sufficient information in order for an informed decision to be taken regarding the Application for EA.

The EIA process being conducted for the San Solar PV facility is undertaken in accordance with Section 24(5) of the NEMA, which defines the procedure to be followed in applying for EA, and requires that the potential consequences for, or impacts of, listed or specified activities on the environment be considered, investigated, assessed, and reported on to the competent authority. Listed Activities are activities identified in terms of Section 24 of the NEMA which are likely to have a detrimental effect on the environment, and which may not commence without an EA from the competent authority subject to the completion of an environmental assessment process (either a Basic Assessment (BA) or full Scoping and EIA).

Table 5.1 contains all the listed activities identified in terms of NEMA, the 2014 EIA Regulations (GNR 326), and Listing Notice 1 (GNR 327), Listing Notice 2 (GNR 325), and Listing Notice 3 (GNR 324) which may be triggered by the proposed development of the San Solar PV facility and associated infrastructure, and for which an application for EA has been made:

Table 5.1: Listed activities identified in terms of the Listing Notices (GNR 327, 325 and 324)

Notice Number	Activity Number	Description of listed activity
Listing Notice 1 (GNR 327) 08 December 2014 (as amended)	11 (i)	The development of facilities or infrastructure for the transmission and distribution of electricity – (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275kV or more. The San Solar PV facility will include a grid connection solution including a 132kV facility substation, and 132kV switching station to be connected via a 132kV Loop-in-Loop out (LILo) connection to the Fox-Umtu 132kV overhead power line located south east of the site.
Listing Notice 1 (GNR 327) 08 December 2014 (as amended)	12(ii)(a)(c)	The development of (ii) infrastructure or structures with a physical footprint of 100 square meters or more; where such development occurs (a) within a watercourse or (c) within 32 meters of a watercourse, measured from the edge of a watercourse. The development of the San Solar PV Facility will require the establishment of infrastructure (including internal access roads) with a physical footprint exceeding 100m² within a watercourse or within 32m of a watercourse identified within the project site
Listing Notice 1 (GNR 327) 08 December 2014 (as amended)	14	The development and related operation of facilities and infrastructure, for the storage, or for the storage and

		<p>handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.</p> <p>The development of the PV facility will require the construction and operation of facilities and infrastructure for the storage and handling of a dangerous good (combustible and flammable liquids, such as oils, lubricants, solvents) associated with the substations where such storage will occur inside containers with a combined capacity exceeding 80 cubic meters but not exceeding 500 cubic meters.</p>
<p>Listing Notice 1 (GNR 327) 08 December 2014 (as amended)</p>	24 (ii)	<p>The development of a road – (ii) with a reserve wider than 13.5m, or where no reserve exists where the road is wider than 8m.</p> <p>Access roads will be developed during the construction phase of the project and may exceed 8m in width.</p>
<p>Listing Notice 1 (GNR 327) 08 December 2014 (as amended)</p>	28 (ii)	<p>Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:</p> <p>(ii) will occur outside an urban area, where the total land to be developed is bigger than 1ha.</p> <p>The total area to be developed for the PV facility and associated infrastructure is greater than 1ha and occurs outside an urban area in an area currently zoned for agriculture.</p>
<p>Listing Notice 2 (GNR 325) 08 December 2014 (as amended)</p>	1	<p>The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20MW or more.</p> <p>The proposed PV facility will have a capacity that exceeds 20MW. The San Solar PV facility will have a contracted capacity of 100MW.</p>

<p>Listing Notice 2 (GNR 325) 08 December 2014 (as amended)</p>	<p>15</p>	<p>The clearance of 20ha or more of indigenous vegetation¹³.</p> <p><i>The development of the San Solar PV facility will require the clearance of indigenous vegetation in excess of 20ha for the development of infrastructure.</i></p>
<p>Listing Notice 3 (GNR 324) 08 December 2014 (as amended)</p>	<p>4(g)(ii)(ee)</p>	<p>The development of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <p>g. Northern Cape</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p><i>The development of the PV facility and associated infrastructures will require the development of roads wider than 4m within an ESA area.</i></p>
<p>Listing Notice 3 (GNR 324) 08 December 2014 (as amended)</p>	<p>10 (g)(iii)(ee)</p>	<p>The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres</p> <p>g. Northern Cape</p> <p>iii. Outside urban areas: (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</p> <p><i>The development of the PV facilities and associated infrastructures will require the storage and handling of a dangerous good with a capacity of 80 cubic meters within an ESA area.</i></p>
<p>Listing Notice 3 (GNR 324) 08 December 2014 (as amended)</p>	<p>12(g)(ii)</p>	<p>The clearance of an area of 300 square metres or more of indigenous vegetation</p>

¹³ "Indigenous vegetation" as defined by the 2014 EIA Regulations (GNR 326) refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.

		<p>g. Northern Cape</p> <p>ii. Within critical biodiversity areas identified in bioregional plans.</p> <p><i>The development of the renewable energy facility and associated infrastructure will require the clearance of more than 300 square meters of indigenous vegetation within an area classified as an ESA.</i></p>
<p>Listing Notice 3 (GNR 324) 08 December 2014 (as amended)</p>	<p>14(g)(ii) (ff)</p>	<p>The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more, where such development occurs (a) within a watercourse, and (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse,</p> <p>g. Northern Cape</p> <p>(ii) outside urban areas (ff) within critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</p> <p><i>The development of the San Solar PV Facility will require the establishment of infrastructure (including internal access roads) with a physical footprint exceeding 10m² within a watercourse or within 32m of a watercourse identified within the project site. The project site is located within the areas identified as Ecological Support Area (ESA).</i></p>
<p>Listing Notice 3 (GNR 324) 08 December 2014 (as amended)</p>	<p>18(g)(ii) (ee)</p>	<p>The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.</p> <p>g. Northern Cape</p> <p>(ee) Within critical biodiversity areas identified in systematic biodiversity plan adopted by the competent authority or in bioregional plans</p> <p><i>The development of the renewable energy facility and associated</i></p>

infrastructures may require the widening of a road by more than 4 metres, outside urban areas and within an area classified as an ESA.

5.2.2 National Water Act (No. 36 of 1998) (NWA)

In accordance with the provisions of the National Water Act (No. 36 of 1998) (NWA), all water uses must be authorised with the Competent Authority (i.e. the Regional Department of Human Settlements, Water and Sanitation (DHSWS) or the relevant Catchment Management Agency (CMA)). Water use is defined broadly, 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 a watercourse, removing water found underground for certain purposes, and recreation.

There is no natural permanent water or artificial earth dams within the project site. There are ephemeral pans in the north of the site. The development area/footprint will be able to completely avoid the ephemeral pans, and as such no further assessment of impacts to the freshwater ecology is recommended or considered necessary.

5.2.3 National Heritage Resources Act (No. 25 of 1999) (NHRA)

The National Heritage Resources Act (No. 25 of 1999) (NHRA) provides an integrated system which allows for the management of national heritage resources, and to empower civil society to conserve heritage resources for future generations. Section 38 of NHRA provides a list of activities which potentially require the undertaking of a Heritage Impact Assessment.

Section 38: Heritage Resources Management

- 1). *Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as –*
- a. *the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
 - b. *the construction of a bridge or similar structure exceeding 50m in length;*
 - c. *any development or other activity which will change the character of a site –*
 - i). *exceeding 5 000m² in extent; or*
 - ii). *Involving three or more existing 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 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.

In terms of Section 38(8), approval from the heritage authority is not required if an evaluation of the impact of such development on heritage resources is required in terms of any other legislation (such as NEMA), provided that the consenting authority ensures that the evaluation of impacts fulfils the requirements of the relevant heritage resources authority in terms of Section 38(3) and any comments and recommendations of the relevant resources authority with regard to such development have been taken into account prior to the granting of the consent. However, should heritage resources of significance be affected by the

proposed development, a permit is required to be obtained prior to disturbing or destroying such resources as per the requirements of Section 48 of the NHRA, and the South African Heritage Resources Agency (SAHRA) Permit Regulations (GNR 668).

5.3 Overview of the Scoping and EIA (S&EIA) Process being undertaken for the San Solar PV facility

In terms of NEMA, the 2014 EIA Regulations (GNR 326), and Listing Notices (Listing Notice 1 (GNR 327), Listing Notice 2 (GNR 325) and Listing Notice 3 (GNR 324) the development of San Solar PV facility requires EA from DFFE subject to the completion of a full Scoping and Environmental Impact Assessment (S&EIA), as prescribed in Regulations 21 to 24 of the 2014 EIA Regulations (GNR 326). The need for a full S&EIA process to be conducted in support of the application for EA is based on listed activities triggered which are contained within Listing Notice 2 (GNR 325).

The S&EIA process is to be undertaken in two phases as follows:

- » The **Scoping Phase** includes the identification and description of potential issues associated with the project through desktop studies, field surveys, as well as consultation with I&APs and key stakeholders through a PPP. The entire project site is considered, and areas of sensitivity are identified and delineated in order to identify any environmental fatal flaws, and environmentally sensitive, or no-go areas which need to be considered. In accordance with Regulation 21(1) of the 2014 EIA Regulations (GNR 326) this Scoping Report prepared for the project will be subject to a 30-day review and comment period during which any Interested and Affected Party (I&AP) or Authority are invited to review and provide comment on the findings (refer to **Figure 5.2**). Following the completion of this review period, a Final Scoping Report (FSR) which incorporates all comments received during the 30-day public review and comment period, will be prepared and submitted to DFFE for consideration. Following receipt of the FSR, DFFE has 43 days within which to either accept the Scoping Report, and advise the applicant to proceed or continue with the tasks contemplated in the Plan of Study for EIA, or refuse the Application for EA in the event that the proposed activity is in conflict with a prohibition contained in legislation, or the Scoping Report does not substantially comply with Appendix 2 of the 2014 EIA Regulations (GNR 326).
- » The **EIA Phase** involves a detailed assessment of potentially significant positive and negative direct, indirect, and cumulative impacts identified during the Scoping Phase. This phase includes detailed specialist investigations and a PPP, and results in the compilation of an EIA Report and Environmental Management Programme (EMPr). In accordance with Regulation 23(1)(a) of the 2014 EIA Regulations (GNR 326) the EIA Report and EMPr prepared for the project will also be subject to a 30-day public review and comment period during which members of the public, I&APs, and authorities will be invited to review and provide comment on the EIA Report and EMPr. Following the conclusion of this review period a Final EIA Report and EMPr which incorporates all comments received during the 30-day review and comments period, will be prepared and submitted to DFFE for its consideration. Following its receipt of the Final EIA Report and EMPr, DFFE has 107 days within which to either grant or refuse the EA.

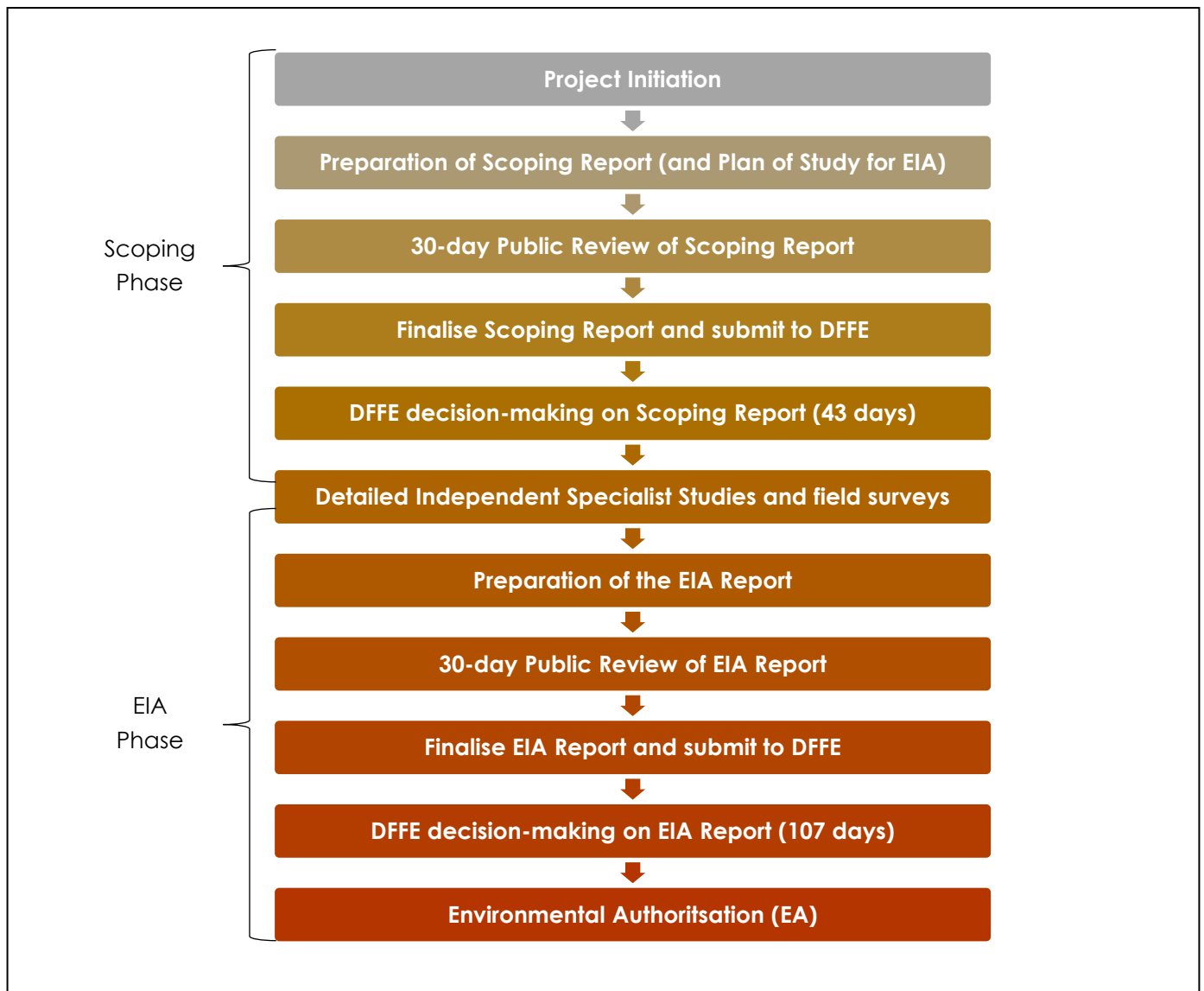


Figure 5.2: Regulated timeframe of an Environmental Impact Assessment (EIA) Process

5.4 Objectives of the Scoping Phase

This Scoping Report documents the evaluation of potential environmental impacts of the San Solar PV facility and forms part of the EIA process being conducted in support of an Application for EA for the project. The Scoping Phase has been conducted in accordance with the requirements of the 2014 EIA Regulations (GNR 326), and therefore aims to:

- » Identify and evaluate potential environmental (biophysical and social) impacts and benefits of all phases of the development (including design, construction, operation and decommissioning) within the project site through a review of existing baseline data, including specialist studies which were undertaken within the project area.
- » Identify potentially sensitive environmental features and areas within the broader project site in order to define the and development area, and inform the preliminary layout/design of the facility within the development area.
- » Define the scope of studies to be undertaken during the EIA process.

- » Provide the authorities with sufficient information in order to make a decision regarding the scope of impacts to be addressed in the EIA Phase, as well as regarding the scope and extent of specialist studies that will be required to be undertaken.

The following objectives of the Scoping Phase (in accordance with Appendix 2 of the 2014 EIA Regulations (GNR 326)) have been met, through the undertaking of a consultative process.

- » The identification of relevant policies and legislation regarding the activities to be undertaken have been identified and considered within this Scoping Report.
- » Activities to be undertaken for the development of San Solar PV have been identified and motivated in terms of the need and desirability for the activities to take place.
- » Potential impacts associated with the undertaking of the identified activities and technology have been identified and described.
- » Areas of high sensitivity to be avoided by the development area have been identified.
- » Key impacts associated with the project to be addressed during the EIA Phase for further detailed study and ground-truthing have been identified and listed within this Scoping Report.
- » The level of assessment, expertise and the extent of further consultation to be undertaken in the EIA Phase of the process, with the aim of determining the extent of impacts associated with the activities through the life cycle of the project (i.e. construction, operation and decommissioning), have been identified and included within this Scoping Report.

5.5 Overview of the Scoping Phase

Key tasks undertaken within the Scoping Phase include:

- » Consultation with relevant decision-making and regulating authorities (at National, Provincial and Local levels).
- » Submission of the completed Application for EA to the competent authority (DFFE) in terms of Regulations 5 and 16 of the 2014 EIA Regulations (GNR 326).
- » Undertaking a PPP (in line with the approved public participation plan submitted to DFFE) in accordance with Chapter 6 of GNR326, and the Department of Environmental Affairs (2017) Public Participation guidelines in order to identify issues and concerns associated with the proposed project.
- » Preparation of a Scoping Report and Plan of Study for EIA in accordance with the requirements of Appendix 2 of the 2014 EIA Regulations (GNR 326).
- » Preparation of a Comments and Response Report (C&RR) detailing all comments raised by I&APs and responses provided as part of the Scoping Phase.
- » Submission of a FSR, including a Plan of Study for the EIA, to DFFE for review and approval.

5.5.1 Authority Consultation and Application for Authorisation in terms of the 2014 EIA Regulations (as amended)

In terms of GNR 779 of 1 July 2016, the National DFFE has been determined as the competent authority for all projects which relate to the IRP and any updates thereto. As the project is proposed within Northern Cape Province, the Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAEARD&LR) is a Commenting Authority on the project. Consultation with these authorities is being undertaken throughout the Scoping Phase. To date, this consultation has included the following:

- » Submission of a Pre-Application Meeting request to DFFE on 01 March 2022 and the proposed Public Participation Plan (PP Plan). The DFFE provided approval of the submitted PP Plan via email on Friday, 04 March 2022, and no pre-application meeting was considered necessary.
- » Submission of the Application for Environmental Authorisation to the DFFE via the use of the DFFE Novell Filr System.
- » Submission of the Scoping Report for review and comment by:
 - * The competent and commenting authorities.
 - * State departments that administer laws relating to a matter affecting the environment relevant to an Application for EA.
 - * Organs of State which have jurisdiction in respect of the activity to which the application relates.

The submissions, as listed above, are all undertaken electronically, as required by the DFFE (in line with the directions for new Applications for Environmental Authorisations provided for in GNR650 of 05 June 2020). A record of all authority correspondence undertaken during the Scoping Phase is included in **Appendix B** and **Appendix C**.

5.5.2 Public Participation Process

Public participation is an essential and regulatory requirement for an environmental authorisation process and is guided by Regulations 41 to 44 of the EIA Regulations 2014 (GN R326) (as amended). The purpose of public participation is clearly outlined in Regulation 40 of the EIA Regulations 2014 (GN R326) (as amended) and is being followed for this project. The benefit to the stakeholder is that all information relevant to the application has been made available for review, and not only for comments to be raised, but also to provide a complete picture of the potential impacts and/or benefits related to the PV project.

The PPP undertaken for San Solar PV facility considers the restrictions and limitations imposed by Government through section 27 (2) of the Disaster Management Act (Act No. 57 of 2002) of 2002 and the Directions issued by the Minister of Forestry and Fisheries (DFFE) in terms of consultations with I&APs. A Public Participation Plan was prepared and submitted to DFFE for approval. Approval of the Plan was provided by the DFFE Case Officer via email on Friday, 04 March 2022 (**Appendix B**).

The alternative means of undertaking consultation have been designed and implemented by Savannah Environmental to ensure that I&APs are afforded sufficient opportunity to access project information and raise comments on the project through an interactive web-based platform (i.e. online stakeholder engagement platform) readily available and accessible to any person registering their interest in the project, and ensures that the PPP is undertaken in line with Regulations 41 to 44 of the EIA Regulations, 2014 as amended. The Public Participation Plan (**Appendix C**) considers the limitations applied by the Disaster Management Act Regulations prohibiting the gathering of people, as well as limitations which certain I&APs may have in terms of access to computers and internet as well as access to public spaces currently not open for operation that inhibits access to hard copy documentation. The online stakeholder engagement platform implemented by Savannah Environmental for the project allows the EAP to visually present details regarding the project as well as consultation documentation. The platform also contains the Scoping Report available for review. The use of an online tool enables stakeholders and I&APs to explore the project-specific content in their own time, and still enables them to participate in a meaningful way in the consultation process.

The sharing of information forms the basis of the PPP and offers the opportunity for I&APs to become actively involved in the EIA process from the outset. The PPP is designed to provide sufficient and accessible

information to I&APs in an objective manner. The PPP affords I&APs opportunities to provide input into and receive information regarding the EIA process in the following ways:

- » During the **Scoping Phase**:
 - * provide an opportunity to submit comments regarding the project;
 - * assist in identifying reasonable and feasible alternatives, where required;
 - * identify potential issues of concern and suggestions for mitigation measures
 - * contribute relevant local information and knowledge to the environmental assessment.
 - * allow registered I&APs to verify that their comments have been recorded, considered and addressed, where applicable, in the environmental investigations;
 - * foster trust and co-operation;
 - * generate a sense of joint responsibility and ownership of the environment;
 - * comment on the findings of the Scoping Phase results; and
 - * Identify issues of concern and suggestions for enhanced benefits.

- » During the **EIA Phase**:
 - * contribute relevant local information and knowledge to the environmental assessment;
 - * verify that issues have been considered in the environmental investigations as far as possible as identified within the Scoping Phase;
 - * comment on the findings of the environmental assessments; and
 - * attend a Focus Group Meeting to be conducted for the project.

- » During the **decision-making phase**:
 - * to advise I&APs of the outcome of the competent authority's decision, and how and by when the decision can be appealed.

The PPP therefore aims to ensure that:

- » Information containing all relevant facts in respect of the application is made available to potential stakeholders and I&APs for their review;
- » The information presented during the PPP is presented in such a manner, i.e. local language and technical issues, that it avoids the possible alienation of the public and prevents them from participating;
- » Public participation is facilitated in such a manner that I&APs are provided with a reasonable opportunity to comment on the project;
- » A variety of mechanisms are provided to I&APs to correspond and submit their comments i.e. fax, post, email, telephone, text message (SMS and WhatsApp); and
- » An adequate review period is provided for I&APs to comment on the findings of the Scoping and EIA Reports.

In terms of the requirement of Chapter 6 of the EIA Regulations of December 2014, as amended, the following key public participation tasks are required to be undertaken:

- » Fix a notice board at a place conspicuous to the public at the boundary or on the fence of—
 - (i) the site where the activity to which the application relates is or is to be undertaken; and
 - (ii) any alternative site mentioned in the application.
- » Give written notice to:
 - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
 - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;

- (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
 - (v) the municipality which has jurisdiction in the area;
 - (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
 - (vii) any other party as required by the competent authority.
- » Place an advertisement in a local newspaper.
 - » Open and maintain a register of I&APs and Organs of State.
 - » Release of a Scoping Report for a 30-day review and comment period.
 - » Prepare the C&RR which documents the comments received through the EIA process together with responses provided to the comments raised.

In compliance with the requirements of Chapter 6: Public Participation of the EIA Regulations, 2014 (as amended), and the approved Public Participation Plan, the following summarises the key public participation activities implemented. The schematic below provides an overview of the tools that are available to I&APs and stakeholders to access project information and interact with the public participation team to obtain project information and resolve any queries that may arise, and to meet the requirements for public participation.

<p>i. Stakeholder identification and register of I&APs</p>	<ul style="list-style-type: none"> • Register as an I&AP on the online platform, via completion of a form and provision of contact information, by responding to an advert, or sending a 'please call me' which will be responded to • State interest in the project • Receive all project related information via email or other appropriate means.
<p>ii. Notifications</p>	<ul style="list-style-type: none"> • Advertisements, site notices, and written notifications provide information and details on where to access project information. • Notification regarding the EIA process and availability of project reports for public review to be sent via email, post or SMS notification.
<p>iii. Public Involvement and consultation</p>	<ul style="list-style-type: none"> • Availability of project information will be via the Savannah website which is accessible and user friendly. • An opportunity for I&APs and stakeholders to request virtual meetings with the project team. • Where limited connectivity is encountered, in-person meeting/s will be arranged with strict COVID protocols followed.
<p>iv. Comment on the Scoping/EIA reports</p>	<ul style="list-style-type: none"> • Availability of the project reports via the online platform for a 30-day comment period. • Where applicable, other electronic platforms (WeTransfer or DropBox), and upon written request CD, USB and/or hard copies will be made available. • Submission of comments facilitated through email, WhatsApp/SMS, direct on-site engagement and where required via post to the PP team. • Comments recorded and responded to, as part of the process.
<p>v. Identification and recording of comments</p>	<ul style="list-style-type: none"> • Comments and Responses Report, including all comments received throughout the process to be included in the reporting.

i. Stakeholder identification and Register of Interested and Affected Parties

42. A proponent or applicant must ensure the opening and maintenance of a register of I&APs and submit such a register to the competent authority, which register must contain the names, contact details and addresses of –
- (a) All persons who, as a consequence of the PPP conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;
 - (b) All persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and
- l All organs of state which have jurisdiction in respect of the activity to which the application relates.

I&APs have been identified through a process of networking and referral, obtaining information from Savannah Environmental's existing stakeholder database, specifically for relevant Organs of State, liaison with potentially affected parties and stakeholders in the greater surrounding area and a registration process involving the completion of a reply form. Key stakeholders and affected and surrounding landowners have been identified and registered on the project database and a landowner map was developed showing the

different land parcels found within the area in order to ensure the landowners are included. Other stakeholders are required to formally register their interest in the project through either directly contacting the Savannah Environmental Public Participation team via phone, text message (SMS and WhatsApp), email or fax, or registering their interest via the online stakeholder engagement platform. An initial list of key stakeholders identified and registered is listed in **Table 5.2**.

Table 5.2: Initial list of Stakeholders identified for the inclusion in the project database during the PPP for San Solar PV facility

Organs of State
National Government Departments
Department of Forestry, Fisheries and the Environment (DFFE)
Department of Mineral Resources and Energy (DMRE)
Department of Agriculture, Land Reform, and Rural Development (DALRRD)
Department of Human Settlements, Water and Sanitation
Department of Communications
Government Bodies and State-Owned Companies
Eskom Holdings SOC Limited
National Energy Regulator of South Africa (NERSA)
Air Traffic Navigation Services (ATNS)
South African Civil Aviation Authority (CAA)
South African Heritage Resources Agency (SAHRA)
South African National Roads Agency Limited (SANRAL)
South African Radio Astronomy Observation (SARAO)
Telkom SA SOC Ltd
Transnet SA SOC Limited
Provincial Government Departments
Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAEARD&LR)
Northern Cape Department of Economic Development and Tourism
Northern Cape Department of Roads and Public Works
Ngwao Boswa Kapa Bokone (NBKB) – provincial Heritage Authority
Local Government Departments
John Taolo Gaetsewe District Municipality
Gamagara Local Municipality – including the Ward Councillor, ward committee members, community representative or local community forum members
Landowners
Affected landowners, tenants and occupiers
Neighbouring landowners, tenants and occupiers
Commenting Stakeholders
BirdLife South Africa
Endangered Wildlife Trust (EWT)
Wildlife and Environment Society of South Africa (WESSA)
Surrounding renewable energy developments
Small, medium and micro enterprises (SMMEs)
Formal local organisations

As per Regulation 42 of the EIA Regulations, 2014 (as amended), all relevant stakeholder and I&AP information has been recorded within a register of I&APs (refer to **Appendix C1** for a listing of the recorded

parties). In addition to the above-mentioned EIA Regulations, point 4.1 of the Public Participation Guidelines has also been followed. The register of I&APs contains the names¹⁴ of:

- » all persons who requested to be registered on the database through the use of the online stakeholder engagement platform or in writing and disclosed their interest in the project;
- » all Organs of State which hold jurisdiction in respect of the activity to which the application relates; and
- » all persons who submitted written comments or attended virtual meetings (or in-person consultation where sanitary conditions can be maintained) and viewed the narrated presentations on the Savannah Environmental online platform during the PPP.

I&APs have been encouraged to register their interest in the EIA process from the onset of the project, and the identification and registration of I&APs will be on-going for the duration of the EIA process. The database of I&APs will be updated throughout the EIA process and will act as a record of all I&APs involved in the PPP.

ii. **Advertisements and Notifications**

- 40.(2)(a) Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of –
- (i) The site where the activity to which the application or proposed application relates is or is to be undertaken; and
 - (ii) Any alternative site.
- 40.(2)(b) Giving written notice, in any of the manners provided for in section 47D of the Act, to –
- (i) The occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;
 - (ii) Owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;
 - (iii) The municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;
 - (iv) The municipality which has jurisdiction in the area;
 - (v) Any organ of state having jurisdiction in respect of any aspect of the activity; and
 - (vi) Any other party as required by the competent authority.
- 40.(2)(c) Placing an advertisement in –
- (i) One local newspaper; or
 - (ii) Any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
- 40.(2)(d) Placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii); and
- 40.(2)(e) Using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to –
- (i) Illiteracy;
 - (ii) Disability; or
 - (iii) Any other disadvantage.

The EIA process was announced with an invitation to the Organs of State, potentially affected and neighbouring landowners and general public to register as I&APs and to actively participate in the process. This was achieved via the following:

¹⁴ Contact details and addresses have not been included in the I&AP database as this information is protected by the Protection of Personal Information Act (No 4 of 2013).

- » Compilation of a background information document (BID) (refer to **Appendix C3**) providing technical and environmental details on the project and how to become involved in the EIA process. This was distributed together with a notification letter via email on **07 March 2022**. The evidence of the distribution is contained in **Appendix C4 and C5** of the Scoping Report. The BID is also available electronically on the Savannah Environmental website <https://savannahsa.com/public-documents/energy-generation/>.
 - The BID and the process notification letter announced the EIA process, notifying Organs of State, potentially affected and neighbouring landowners, as well as registered stakeholders/I&APs of the EIA process for the San Solar PV facility,
 - provided background information on the project
 - invited I&APs to register on the project database
 - announced the availability of the Scoping report, the review period, and where it is accessible for review
- » Placement of site notices announcing the EIA process at visible points along the boundary of the development area (i.e. the boundaries of the affected property), in accordance with the requirements of the EIA Regulations on **07 March 2022**. Photographs and the GPS co-ordinates of the site notices are contained in **Appendix C2** of the Scoping Report.
- » Placement of an advertisement in the Kathu Gazette Newspaper on **04 March 2022** announcing the 30-day review and comment period (**Appendix C2**). This advert:
 - announced the project and the associated EIA process,
 - announced the availability of the Scoping report, the review period, and where it is accessible for review,
 - invited comment on the Scoping Report, and
 - provided all relevant details to access the Savannah Environmental online stakeholder engagement platform.
- » A copy of the newspaper advert as sent to the newspaper is included in **Appendix C2** of the Scoping Report.
- » The Scoping Report has been made available for review by I&APs for a 30-day review and comment period from **Tuesday, 08 March 2022** to **Friday, 08 April 2022**. The full Scoping Report is available on the Savannah Environmental website. The evidence of distribution of the Scoping Report will be included in the FSR, which will be submitted to the DFFE.

iii. Public Involvement and Consultation

In order to accommodate the varying needs of stakeholders and I&APs within the surrounding area, as well as capture their views, comments, issues and concerns regarding the project, various opportunities have been and will continue to be provided to I&APs to note their comments and issues. I&APs are being consulted through the following means:

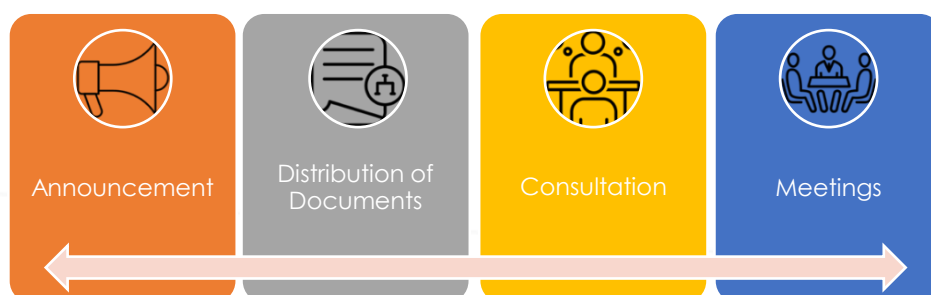


Table 5.3: Summary of Public involvement process for San Solar PV – Scoping phase

Activity	Date
Distribution of the BID, process notification letters and stakeholder reply form announcing the EIA process and inviting I&APs to register on the project database. Letters distributed to landowners, in terms of the EIA regulations, 2014, as amended, regulation 41 (2)(b)(i). The BID and electronic reply form was also made available on Savannah Environmental's website.	08 March 2022
Placement of site notices.	07 March 2022
Advertising of the availability of the Scoping Report for a 30-day review and comment period in Kathu Gazette Newspaper, including details on how to access the Scoping Report via Savannah Environmental's website	04 March 2022
Distribution of notification letters announcing the availability of the Scoping Report for a 30-day review and comment period. These letters were distributed to Organs of State, Government Departments, Ward Councillors, landowners within the surrounding area (including neighbouring landowners) and key stakeholder groups.	08 March 2022
Focus group meeting with Key Commenting Authorities, meeting notes have been appended as Appendix C7 .	18 January 2022
30-day review and comment period of the Scoping Report.	08 March – 11 April 2022
Virtual meetings through the use of virtual platforms as determined through discussions with the relevant stakeholder group: 1. Landowners 2. Authorities and key stakeholders (including Organs of State, local municipality and official representatives of community-based organisations). 3. Interested & Affected Parties (I&APs)	14 March – 25 March 2022
On-going consultation (i.e. telephone liaison; e-mail communication) with all I&APs.	Throughout the Scoping/EIA process

iv. Registered I&APs entitled to Comment on the Scoping Report

- 43.(1) A registered I&AP is entitled to comment, in writing, on all reports or plans submitted to such party during the PPP contemplated in these Regulations and to bring to the attention of the proponent or applicant any issues which that party believes may be of significance to the consideration of the application, provided that the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.
- (2) In order to give effect to section 24O of the Act, any State department that administers a law relating to a matter affecting the environment must be requested, subject to regulation 7(2), to comment within 30 days.
- 44.(1) The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.
- (2) Where a person desires but is unable to access written comments as contemplated in subregulation (1) due to –
(a) A lack of skills to read or write;
(b) Disability; or
(c) Any other disadvantage;
Reasonable alternative methods of recording comments must be provided for.

I&APs registered on the database have been notified by means of a notification letter of the release of the Scoping Report for a 30-day review and comment period, invited to provide comment on the Scoping Report, and informed of the manner in which, and timeframe within which such comment must be made. The report has been made available in soft copies to I&APs due to restrictions and limitations on public spaces and limitations in ensuring sanitary conditions of hard copy documents during the national state of disaster related to COVID-19.

The Scoping Report has also been made available on the Savannah Environmental website (i.e. online stakeholder engagement platform) <https://savannahsa.com/public-documents/energy-generation/> The notification was distributed prior to commencement of the 30-day review and comment period, on **07 March 2022**. Where I&APs are not able to provide written comments (including SMS and WhatsApp), other means of consultation, such as telephonic discussions are used to provide the I&APs with a platform to verbally raise their concerns and comments on the proposed development.

All comments raised as part of the discussions and written comments submitted during the 30-day review and comment period will be recorded and included in **Appendix C** of the FSR.

v. Identification and Recording of Comments

Comments raised by I&APs over the duration of the Scoping Phase have been synthesised into the C&RR which is included in **Appendix C8**. The C&RR will further be updated to include written comments received during the 30-day review and comment period. The C&RR will include appropriate responses from members of the EIA project team and/or the project proponent to the comments raised during the PPP.

Below is a summary of the key comments raised through the consultation process to date.

Social:

- » Ensure there is thorough consultation with the key stakeholders and I&APs.
- » It is recommended that consultation with the municipal representatives take place with the inclusion of the Communication Director and ward representatives.
- » Network connectivity is a challenge in the area and as such alternative means are recommended to maximise the consultation reach.
- » Consultation should include, but not be restricted to the Kathu and Deben areas.

Ecology

- » • What is the expected development footprint area and impact thereof.
- » • All protected trees, irrespective of their size must be permitted for removal.
- » • The cumulative impacts are to be assessed considering the surrounding solar developments.

Land-use and Capability

- Consideration is to be taken to the current, planned and post development land use and capability.

5.5.3 Finalisation of the Scoping Report

The final stage of the Scoping Phase entails the recording and capturing of comments received from stakeholders and I&APs on the Scoping Report in order to finalise the Scoping Report for submission to DFFE for decision-making. All written comments received will be included within the C&RR (**Appendix C8**).

5.6 Evaluation of Issues Identified through the Scoping Process

In terms of GN R960 (promulgated on 5 July 2019) and Regulation 16(1)(b)(v) of the 2014 EIA Regulations (as amended), the submission of a Screening Report generated from the national web based environmental screening tool is compulsory for the submission of applications in terms of Regulations 19 and 21 of the EIA Regulations.

The requirement for the submission of a Screening Report (included as **Appendix L** of the Scoping Report) for the San Solar PV facility is applicable as it triggers Regulation 19 of the EIA Regulations, 2014 (as amended). **Table 5.4** provides a summary of the specialist assessments identified in terms of the screening tool and responses to each assessment from the project team considering the project site under consideration.

Table 5.4: Sensitivity ratings from the DFFE's web-based online Screening Tool associated with the development of the San Solar PV facility

Specialist Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	Project Team Response
Agricultural Impact Assessment	Medium	The Soils and Agricultural scoping study is included in this Scoping Report as Appendix F . Based on the outcome of the desktop analysis of available data, it has been concluded that the entire development area has low sensitivity to the development from the perspective of soil and agricultural potential conservation. The impacts to soils and agriculture will be further assessed during the EIA phase.
Landscape/Visual Impact Assessment	The screening report does not indicate a rating for this theme.	A Visual scoping study is included as Appendix H in this Scoping Report. The fact that some components of the proposed San Solar PV Facility and associated infrastructure may be visible does not necessarily imply a high visual impact. Sensitive visual receptors within (but not restricted to) a 3km buffer zone from the facility need to be identified and the severity of the visual impact assessed within the EIA phase.
Archaeological and Cultural Heritage Impact Assessment	Very High	A Heritage Screening (which covers archaeological and cultural landscape aspects of the project site) is included in this Scoping Report as Appendix G . Based on the findings it is not anticipated that the San Solar PV development will have a negative impact on any archaeological resources, or on any significant cultural landscape in the area due to the existing similar infrastructure here. Furthermore, it is often preferred to have development such as PV facilities clustered in one area to mitigate the sprawl of this infrastructure across otherwise pristine landscapes and as such no further assessment of impacts to the archaeology and cultural heritage is recommended, or considered necessary.
Palaeontology Impact Assessment	High	A Palaeontology report is included in this Scoping Report as Appendix G . Based on the findings it is unlikely that the development will impact significant palaeontological heritage and as such no further assessment of impacts to the palaeontology is recommended or considered necessary.
Terrestrial Biodiversity Impact Assessment	Very high	An Ecological scoping study (including flora and fauna) has been undertaken for the PV facility and is included as Appendix

			D of the Scoping Report. Based on the outcomes of the desktop study and available data, it has been indicated that the project site includes areas identified as Low to High-Very High Sensitivity. The impacts will be further assessed during the EIA phase.
Aquatic Biodiversity Impact Assessment	Very high		An Ecological scoping study has been undertaken for the PV facility and is included as Appendix D of the Scoping Report. There is no natural permanent water or artificial earth dams within the project site. There are ephemeral pans in the north of the site. The development area/footprint will be able to completely avoid the ephemeral pans, and as such no further assessment of impacts to the freshwater ecology is recommended or considered necessary.
Avian Impact Assessment	High		An Avifauna scoping study (including seasonal monitoring as per the BirdLife SA Best Practice Guidelines) has been undertaken for the PV facility and included as Appendix E of the Scoping Report. Based on the outcome of the first survey it has been concluded that the project site has few selected areas of high sensitivity. The impacts will be further assessed during the EIA phase.
Civil Aviation Assessment	Medium		The Civil Aviation Authority will be consulted throughout the Scoping/EIA process to obtain input due to the proximity of the Sishen airport.
Defence Assessment	Low		A defence or military base is not located within close proximity to the PV facility.
RFI Assessment	Low		The project site under consideration for is located within an area that as classified as having low sensitivity for telecommunication. The South African Radio Astronomy Observatory (SARAO) will however be consulted to provide written comment on the proposed development.
Geotechnical Assessment	The screening report does not indicate a rating for this theme.		Prior to initiating construction, a geotechnical survey will be conducted to acquire information regarding the physical characteristics of soil and rocks underlying a proposed project site and informs the design of earthworks and foundations for structures.
Socio-Economic Assessment	The screening report does not indicate a rating for this theme.		A social scoping study has been undertaken for the PV facility and is included as Appendix I of the Scoping Report. The impacts to social environment will be further assessed during the EIA phase.
Plant Species Assessment	Low		An Ecological scoping study (including flora and fauna) has been undertaken for the PV facility and is included as Appendix D of the Scoping Report. Based on the outcomes of the Scoping study and available data, the project site includes areas identified as Low to high sensitivity.
Animal Species Assessment	Medium		Based on the outcomes of the desktop study and available data, it has been indicated that the project site includes areas identified as Low to High-Very High Sensitivity. The impacts will be further assessed during the EIA phase.

Issues (both direct and indirect environmental impacts) associated with the San Solar PV facility identified within the scoping process have been evaluated through specialist studies by specialist consultants. These specialists include:

Specialist	Area of Expertise	Refer Appendix
Simon Todd - 3Foxes Biodiversity Solutions	Ecology (Terrestrial and Freshwater)	Appendix D
Lukas Niemand - Pachnoda Consulting	Avifauna	Appendix E
Marine Pienaar - TerraAfrica	Soils and Agricultural Potential	Appendix F
Jenna Lavin - CTS Heritage	Heritage (including archaeology, cultural landscape and palaeontology)	Appendix G
Lourens du Plessis - LOGIS	Visual	Appendix H
Nondumiso Bulunga - Savannah Environmental and Tony Barbour	Social	Appendix I

In order to evaluate issues and assign an order of priority, the following methodology was used to identify the characteristics of each potential issue/impact for each of the proposed project components:

- » Identify the **nature** of the potential impact, which includes a description of what causes the effect, what will be affected and how it will be affected.
- » Identify the **extent** of the potential impact, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development) or regional.
- » Identify **sensitive receptors** that may be impacted on by the San Solar PV and the **types of impacts** that are most likely to occur.
- » Evaluate the **significance** of potential impacts in terms of the requirements of the EIA Regulations including nature, significance, consequence, extent, duration and probability of the impacts, the degree to which these impacts a) can be reversed; (b) may cause irreplaceable loss of resources; and (c) can be avoided, managed or mitigated.
- » Identify the potential impacts that will be **considered further** in the EIA Phase through detailed investigations.

5.7 Assumptions and Limitations of the EIA Process

The following assumptions and limitations are applicable to the EIA process of San Solar PV:

- » All information provided by the developer and I&APs to the environmental team was correct and valid at the time it was provided.
- » It is assumed that the development area for the solar PV facility identified by the developer represents a technically suitable site for the establishment of San Solar PV which is based on the design undertaken by technical consultants for the project.
- » The development footprint (the area that will be affected during the operation phase) will include the footprint for the PV facility and associated infrastructure (i.e. internal access roads, BESS and grid connection infrastructure).
- » The Scoping Phase evaluation of impacts has been largely based on desktop studies. This information has been used to inform this Scoping report and will be verified by specialists in the EIA phase to assess the project development footprint for San Solar PV.

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

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

- » National Environmental Management Act (Act No. 107 of 1998);
- » EIA Regulations of December 2014, published under Chapter 5 of NEMA (as amended);
- » Department of Environmental Affairs (2017), Public Participation guidelines in terms of NEMA EIA Regulations;
- » Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for environmental authorisation; and
- » International guidelines – the Equator Principles, the IFC Performance Standards, the Sustainable Development Goals, World Bank Environmental and Social Framework, and the and World Bank Group Environmental, Health, and Safety Guidelines (EHS Guidelines).

Several other Acts, standards or guidelines have also informed the project process and the scope of issues addressed and assessed in this Scoping Report. A review of legislative requirements applicable to the proposed project is provided in **Table 5.5**.

Table 5.5: Relevant legislative permitting requirements applicable to San Solar PV

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Legislation			
Constitution of the Republic of South Africa (No. 108 of 1996)	In terms of Section 24, the State has an obligation to give effect to the environmental right. The environmental right 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: o Prevent pollution and ecological degradation, o Promote conservation, and o Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”	Applicable to all authorities	There are no permitting requirements associated with this Act. The application of the Environmental Right however implies that environmental impacts associated with proposed developments are considered separately and cumulatively. It is also important to note that the “right to an environment clause” includes the notion that justifiable economic and social development should be promoted, through the use of natural resources and ecologically sustainable development.
National Environmental Management Act (No 107 of 1998) (NEMA)	The 2014 EIA Regulations have been promulgated in terms of Chapter 5 of NEMA. Listed activities which may not commence without EA are identified within the Listing Notices (GNR 327, GNR 325 and GNR 324) which form part of these Regulations (GNR 326). In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation.	DFFE – Competent Authority Northern Cape DAEARD&LR – Commenting Authority	The listed activities triggered by the proposed project have been identified and are being assessed as part of the EIA process currently underway for the project. The EIA process will culminate in the submission of a FSR and a Plan of Study for EIA to DFFE for approval. Considering the capacity of the proposed San Solar PV facility project (i.e. contracted capacity of 100MW) and the triggering of Activity 1 of Listing Notice 2 (GNR 325) a full Scoping and EIA process is required in support of the Application for EA.
National Environmental Management Act (No 107 of 1998) (NEMA)	In terms of the “Duty of Care and Remediation of Environmental Damage” provision in Section 28(1) of NEMA every person who causes, has caused or may cause	DFFE	While no permitting or licensing requirements arise directly by virtue of the proposed project, this section finds application through the

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.</p> <p>In terms of NEMA, it is the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts.</p>	<p>Northern Cape DAEARD&LR – Commenting Authority</p>	<p>consideration of potential cumulative, direct, and indirect impacts. It will continue to apply throughout the life cycle of the project.</p>
<p>Environment Conservation Act (No. 73 of 1989) (ECA)</p>	<p>The Noise Control Regulations in terms of Section 25 of the ECA contain regulations applicable for the control of noise in the Provinces of Limpopo, North West, Mpumalanga, Northern Cape, Eastern Cape, and KwaZulu-Natal Provinces.</p> <p>The Noise Control Regulations cover the powers of a local authority, general prohibitions, prohibitions of disturbing noise, prohibitions of noise nuisance, use of measuring instruments, exemptions, attachments, and penalties.</p> <p>In terms of the Noise Control Regulations, no person shall make, produce or cause a disturbing noise, or allow it to be made, produced or caused by any person, machine, device or apparatus or any combination thereof (Regulation 04).</p>	<p>DFFE Northern Cape DAEARD&LR – Commenting Authority</p> <p>Gamagara Municipality Local</p>	<p>Noise impacts are expected to be associated with the construction phase of the project. Considering the location of the development area in relation to residential areas and provided that appropriate mitigation measures are implemented, construction noise is unlikely to present a significant intrusion to the local community. There is therefore no requirement for a noise permit in terms of the legislation.</p>
<p>National Water Act (No. 36 of 1998) (NWA)</p>	<p>A water use listed under Section 21 of the NWA must be licensed with the Regional DWS, unless it is listed in Schedule 1 of the NWA (i.e. is an existing lawful use), is permissible under a GA, or if a responsible authority waives the need for a licence.</p> <p>Water use is defined broadly, and includes consumptive and non-consumptive water uses, taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact</p>	<p>Regional Department of Water and Sanitation</p>	<p>An Ecological scoping study has been undertaken for the PV facility and is included as Appendix D of the Scoping Report.</p> <p>There is no natural permanent water or any artificial earth dams within the project site. There are three ephemeral pans located in the northern section of the site. The development footprint will be able to completely avoid the ephemeral pans.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation.</p> <p>Consumptive water uses may include taking water from a water resource (Section 21(a)) and storing water (Section 21(b)).</p> <p>Non-consumptive water uses may include impeding or diverting of flow in a water course (Section 21(c)), and altering of bed, banks or characteristics of a watercourse (Section 21(i)).</p>		
<p>Minerals and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA)</p>	<p>In accordance with the provisions of the MPRDA a mining permit is required in accordance with Section 27(6) of the Act where a mineral in question is to be mined, including the mining of materials from a borrow pit.</p> <p>Section 53 of the MPRDA states that any person who intends to use the surface of any land in any way which may be contrary to any object of the Act, or which is likely to impede any such object must apply to the Minister for approval in the prescribed manner.</p>	<p>Department of Mineral Resources and Energy (DMRE)</p>	<p>Any person who wishes to apply for a mining permit in accordance with Section 27(6) must simultaneously apply for an Environmental Authorisation in terms of NEMA. No borrow pits are expected to be required for the construction of the project, and as a result a mining permit or EA in this regard is not required to be obtained.</p> <p>In terms of Section 53 of the MPRDA approval is required from the Minister of Mineral Resources and Energy to ensure that the proposed development does not sterilise a mineral resource that might occur on site.</p>
<p>National Environmental Management: Air Quality Act (No. 39 of 2004) (NEM:AQA)</p>	<p>The National Dust Control Regulations (GNR 827) published under Section 32 of NEM:AQA prescribe the general measures for the control of dust in all areas, and provide a standard for acceptable dustfall rates for residential and non-residential areas.</p> <p>In accordance with the Regulations (GNR 827) any person who conducts any activity in such a way as to give rise to dust in quantities and concentrations that may exceed the dustfall</p>	<p>Northern Cape DAEARD&LR – Commenting Authority / John Taolo Gaetsewe District Municipality</p>	<p>In the event that the project results in the generation of excessive levels of dust the possibility could exist that a dustfall monitoring programme would be required for the project, in which case dustfall monitoring results from the dustfall monitoring programme would need to be included in a dust monitoring report, and a dust management plan would need to be developed.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>standard set out in Regulation 03 must, upon receipt of a notice from the air quality officer, implement a dustfall monitoring programme.</p> <p>Any person who has exceeded the dustfall standard set out in Regulation 03 must, within three months after submission of the dustfall monitoring report, develop and submit a dust management plan to the air quality officer for approval.</p>		
<p>National Heritage Resources Act (No. 25 of 1999) (NHRA)</p>	<p>Section 07 of the NHRA stipulates assessment criteria and categories of heritage resources according to their significance.</p> <p>Section 35 of the NHRA provides for the protection of all archaeological and palaeontological sites, and meteorites.</p> <p>Section 36 of the NHRA provides for the conservation and care of cemeteries and graves by SAHRA where this is not the responsibility of any other authority.</p> <p>Section 38 of the NHRA lists activities which require developers or any person who intends to undertake a listed activity to notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development.</p> <p>Section 44 of the NHRA requires the compilation of a Conservation Management Plan as well as a permit from SAHRA for the presentation of archaeological sites as part of tourism attraction.</p>	<p>South African Heritage Resources Agency (SAHRA)</p> <p>Ngwao Boswa Kapa Bokone (NBKB) – provincial heritage authority</p>	<p>Based on the findings of the heritage screening report and the palaeontological impact assessment (refer to Appendix G), it is unlikely that the proposed development will impact significant archaeological or palaeontological heritage and as such, the assessment of archaeology and palaeontology will not be necessary during the EAI phase. However, it is possible that the excavations associated with the development may impact significant archaeological heritage located below the ground surface and as such, it has been recommended by the specialist that:</p> <ul style="list-style-type: none"> » Should any sink holes or ESA archaeological artefacts be uncovered during the course of excavation activities, work must cease in that area and SAHRA must be contacted regarding a way forward » The attached Chance Fossil Finds Procedure is implemented for the duration of excavation activities

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
<p>National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEM:BA)</p>	<p>Section 53 of NEM:BA provides for the MEC / Minister to identify any process or activity in such a listed ecosystem as a threatening process.</p> <p>Three government notices have been published in terms of Section 56(1) of NEM:BA as follows:</p> <ul style="list-style-type: none"> » Commencement of TOPS Regulations, 2007 (GNR 150). » Lists of critically endangered, vulnerable and protected species (GNR 151). » TOPS Regulations (GNR 152). <p>It provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), and vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (NEM:BA: National list of ecosystems that are threatened and in need of protection, (Government Gazette 37596, GNR 324), 29 April 2014).</p>	<p>DFFE</p> <p>Northern Cape DAEARD&LR</p>	<p>Under NEM:BA, a permit would be required for any activity that is of a nature that may negatively impact on the survival of a listed protected species.</p> <p>Three NFA-protected tree species occur at the site, <i>Boscia albitrunca</i>, <i>Vachelia erioloba</i> and <i>Vachelia haematoxylon</i>.</p> <p>Although no <i>Vachelia haematoxylon</i> were observed on the site, it is possible that this species is present at a low density. Apart from these protected tree species, there are also several provincially protected species confirmed present such as <i>Babiana hypogaea</i> and <i>Nerine laticoma</i>. Refer to the Ecological Scoping Study (Appendix D). The impacts will be further assessed during the EIA phase.</p>
<p>National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEM:BA)</p>	<p>Chapter 5 of NEM:BA pertains to alien and invasive species, and states that a person may not carry out a restricted activity involving a specimen of an alien species without a permit issued in terms of Chapter 7 of NEM:BA, and that a permit may only be issued after a prescribed assessment of risks and potential impacts on biodiversity is carried out.</p> <p>Applicable, and exempted alien and invasive species are contained within the Alien and Invasive Species List (GNR 864).</p>	<p>DFFE</p> <p>Northern Cape DAEARD&LR</p>	<p>An Ecological scoping study has been undertaken for the PV facility and is included as Appendix D of the Scoping Report.</p> <p>Further impacts will be further assessed during the EIA phase.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
<p>Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA)</p>	<p>Section 05 of CARA provides for the prohibition of the spreading of weeds.</p> <p>Regulation 15 of GN R1048 published under CARA provides for the classification of categories of weeds and invader plants, and restrictions in terms of where these species may occur.</p> <p>Regulation 15E of GN R1048 published under CARA provides requirement and methods to implement control measures for different categories of alien and invasive plant species.</p>	<p>Department of Agriculture, Rural Development, and Land Reform (DARDLR)</p>	<p>CARA will find application throughout the life cycle of the project. In this regard, soil erosion prevention and soil conservation strategies need to be developed and implemented. In addition, a weed control and management plan must be implemented.</p> <p>In terms of Regulation 15E (GN R1048) where Category 1, 2 or 3 plants occur a land user is required to control such plants by means of one or more of the following methods:</p> <ul style="list-style-type: none"> » Uprooting, felling, cutting or burning. » Treatment with a weed killer that is registered for use in connection with such plants in accordance with the directions for the use of such a weed killer. » Biological control carried out in accordance with the stipulations of the Agricultural Pests Act (No. 36 of 1983), the ECA and any other applicable legislation. » Any other method of treatment recognised by the executive officer that has as its object the control of plants concerned, subject to the provisions of sub-regulation 4. » A combination of one or more of the methods prescribed, save that biological control reserves and areas where biological control agents are effective shall not be disturbed by other control methods to the extent that the agents are destroyed or become ineffective.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
<p>National Forests Act (No. 84 of 1998) (NFA)</p>	<p>According to this Act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. Notice of the List of Protected Tree Species under the National Forests Act (No. 84 of 1998) was published in GNR 734.</p> <p>The prohibitions provide that “no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister”.</p>	<p>Department of Forestry, Fisheries and the Environment - DFFE</p>	<p>An Ecological Impact Assessment will be undertaken as part of the EIA Phase to identify the presence of any protected trees present on site which will require a permit.</p> <p>Three NFA-protected tree species occur at the site, <i>Boscia albitrunca</i>, <i>Vachelia erioloba</i> and <i>Vachelia haematoxylon</i>.</p> <p>Although no <i>Vachelia haematoxylon</i> were observed on the site, it is possible that this species is present at a low density. Apart from these protected tree species, there are also several provincially protected species confirmed present such as <i>Babiana hypogaea</i> and <i>Nerine laticoma</i>. Refer to the Ecological Scoping Study (Appendix D). The impacts will be further assessed during the EIA phase.</p> <p>A licence is required for the removal of protected trees. It is therefore necessary to conduct a walk-through survey that will determine the number and relevant details pertaining to protected tree species present in the development footprint for the submission of relevant permits to authorities prior to the disturbance of these individuals. This survey will be undertaken prior to construction commencing only.</p>
<p>National Veld and Forest Fire Act (No. 101 of 1998) (NVFFA)</p>	<p>Chapter 4 of the NVFFA places a duty on owners to prepare and maintain firebreaks, the procedure in this regard, and the role of adjoining owners and the fire protection association. Provision is also made for the making of firebreaks on the</p>	<p>DFFE</p>	<p>While no permitting or licensing requirements arise from this legislation, this Act will be applicable during the construction and operation of San Solar PV, in terms of the</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>international boundary of the Republic of South Africa. The applicant must ensure that firebreaks are wide and long enough to have a reasonable chance of preventing a veldfire from spreading to or from neighbouring land, it does not cause soil erosion, and it is reasonably free of inflammable material capable of carrying a veldfire across it.</p> <p>Chapter 5 of the Act places a duty on all owners to acquire equipment and have available personnel to fight fires. Every owner on whose land a veldfire may start or burn or from whose land it may spread must have such equipment, protective clothing and trained personnel for extinguishing fires, and ensure that in his or her absence responsible persons are present on or near his or her land who, in the event of fire, will extinguish the fire or assist in doing so, and take all reasonable steps to alert the owners of adjoining land and the relevant fire protection association, if any.</p>		<p>preparation and maintenance of firebreaks, and the need to provide appropriate equipment and trained personnel for firefighting purposes.</p>
<p>Hazardous Substances Act (No. 15 of 1973) (HAS)</p>	<p>This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger, to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products.</p> <ul style="list-style-type: none"> » Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc., nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared as Group I or Group II substance » Group IV: any electronic product, and » Group V: any radioactive material. 	<p>Department of Health (DoH)</p>	<p>It is necessary to identify and list all Group I, II, III, and IV hazardous substances that may be on site and in what operational context they are used, stored or handled. If applicable, a license would be required to be obtained from the DoH.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
<p>National Environmental Management: Waste Act (No. 59 of 2008) (NEM:WA)</p>	<p>The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force.</p> <p>The Minister may by notice in the Gazette publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment.</p> <p>The Minister may amend the list by –</p> <ul style="list-style-type: none"> » Adding other waste management activities to the list. » Removing waste management activities from the list. » Making other changes to the particulars on the list. <p>In terms of the Regulations published in terms of NEM:WA (GNR 912), a BA or EIA is required to be undertaken for identified listed activities.</p> <p>Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that:</p> <ul style="list-style-type: none"> » The containers in which any waste is stored, are intact and not corroded or in » Any other way rendered unlit for the safe storage of waste. » Adequate measures are taken to prevent accidental spillage or leaking. » The waste cannot be blown away. » Nuisances such as odour, visual impacts and breeding of vectors do not arise, and » Pollution of the environment and harm to health are prevented. 	<p>DFFE – Hazardous Waste</p> <p>Northern Cape DAEARD&LR – General Waste</p>	<p>No waste listed activities are triggered by San Solar PV, therefore, no Waste Management License is required to be obtained. General and hazardous waste handling, storage and disposal will be required during construction and operation. The National Norms and Standards for the Storage of Waste (GNR 926) published under Section 7(1)(c) of NEM:WA will need to be considered in this regard.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
<p>National Road Traffic Act (No. 93 of 1996) (NRTA)</p>	<p>The technical recommendations for highways (TRH 11): "Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads" outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed.</p> <p>Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts.</p> <p>The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations.</p>	<p>South African National Roads Agency (SANRAL) – national roads</p> <p>Northern Cape Department of Transport, Safety and Liaison</p>	<p>An abnormal load / vehicle permit may be required to transport the various components to site for construction. These include route clearances and permits required for vehicles carrying abnormally heavy or abnormally dimensioned loads and transport vehicles exceeding the dimensional limitations (length) of 22m. Depending on the trailer configuration and height when loaded, some of the on-site substation and BESS components may not meet specified dimensional limitations (height and width) which will require a permit.</p>
Provincial Policies / Legislation			
<p>Northern Cape Nature Conservation Act (Act No. 9 of 2009)</p>	<p>This Act provides for the sustainable utilisation of wild animals, aquatic biota and plants; provides for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora; provides for offences and penalties for contravention of the Act; provides for the appointment of nature conservators to implement the provisions of the Act; and provides for the issuing of permits and other authorisations. Amongst other regulations, the following may apply to the current project:</p>	<p>Northern Cape DAEARD&LR</p>	<p>A collection/destruction permit must be obtained from Northern Cape DAEARD&LR for the removal of any Provincially protected species found on site.</p> <p>Should these species be confirmed within the development footprint during any phase of the project, permits will be required.</p> <p>There are also several provincially protected species confirmed present such as <i>Babiana hypogaea</i> and <i>Nerine laticoma</i>. Refer to the</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<ul style="list-style-type: none"> » Boundary fences may not be altered in such a way as to prevent wild animals from freely moving onto or off of a property; » Aquatic habitats may not be destroyed or damaged; » The owner of land upon which an invasive species is found (plant or animal) must take the necessary steps to eradicate or destroy such species; <p>The Act provides lists of protected species for the Province.</p>		<p>Ecological Scoping Study (Appendix D). The impacts will be further assessed during the EIA phase.</p>

5.8.1 Best Practice Guidelines Birds & Solar Energy (2017)

The Best Practice Guidelines Birds & Solar Energy (2017) proposed by the Birds and Renewable Energy Specialist Group (BARESG) (convened by BirdLife South Africa and the Endangered Wildlife Trust) contain guidelines for assessing and monitoring the impact of solar generation facilities on birds in Southern Africa. The guidelines recognise the impact that solar energy may have on birds, through for example the alteration of habitat, the displacement of populations from preferred habitat, and collision and burn mortality associated with elements of solar hardware and ancillary infrastructure; and the fact that the nature and implications of these effects are poorly understood.

The guidelines are aimed at Environmental Assessment Practitioners (EAPs), avifaunal specialists, developers and regulators and propose a tiered assessment process, including:

- » Preliminary avifaunal assessment – an initial assessment of the likely avifauna in the area and possible impacts, preferably informed by a brief site visit and by collation of available data; also including the design of a site-specific survey and monitoring project should this be deemed necessary.
- » Data collection – further accumulation and consolidation of the relevant avian data, possibly including the execution of baseline data collection work (as specified by the preliminary assessment), intended to inform the avian impact study.
- » Impact assessment – a full assessment of the likely impacts and available mitigation options, based on the results of systematic and quantified monitoring if this was deemed a requisite at preliminary assessment.
- » Monitoring – repetition of baseline data collection, plus the collection of mortality data. This helps to develop a complete before and after picture of impacts, and to determine if proposed mitigation measures are implemented and are effective, or require further refinement. Monitoring may only be necessary for projects with the potential for significant negative impacts on birds (i.e. large area affected and / or vulnerable species present).

In terms of the guidelines the quantity and quality of baseline data required to inform the assessment process at each site should be set in terms of the size of the site and the predicted impacts of the solar technology in question, the anticipated sensitivity of the local avifauna (for example, the diversity and relative abundance of priority species present, proximity to important flyways, wetlands or other focal sites) and the amount of existing data available for the area.

Data collection could vary from a single, short field visit (Regime 1, for e.g. at a small or medium sized site with low avifaunal sensitivity), to a series of multi-day survey periods, including the collection of various forms of data describing avian abundance, distribution and movement and spread over 12 months (Regime 3, for e.g. at a large developments located in a sensitive habitat, or which otherwise may have significant impacts on avifauna). **Table 5.6** is taken from the best practise guidelines and provides a summary of the recommended assessment regimes in relation to proposed solar energy technology, project size, and likely risk).

Table 5.6: Recommended avian assessment regimes in relation to proposed solar energy technology, project size, and known impact risks.

Type of technology*	Size**	Avifaunal Sensitivity***		
		Low	Medium	High
All except CSP power tower	Small (< 30ha)	Regime 1	Regime 1	Regime 2
	Medium (30 – 150ha)	Regime 1	Regime 2	Regime 2
	Large (> 150ha)	Regime 2****	Regime 2	Regime 3

Type of technology*	Size**	Avifaunal Sensitivity***		
		Low	Medium	High
CSP power tower	All	Regime 3		
Regime 1: One site visit (peak season); minimum 1 – 5 days.				
Regime 2: Pre- and post-construction; minimum 2 – 3 x 3 – 5 days over 6 months (including peak season); carcass searches.				
Regime 3: Pre- and post-construction; minimum 4 – 5 x 4 – 8 days over 12 months, carcass searches.				
* Different technologies may carry different intrinsic levels of risk, which should be taken into account in impact significance ratings				
** For multi-phased projects, the aggregate footprint of all the phases should be used. At 3ha per MW, Small = < 10MW, Medium = 10 – 50MW, Large = > 50MW.				
*** The avifaunal sensitivity is based on the number of priority species present, or potentially present, the regional, national or global importance of the affected area for these species (both individually and collectively), and the perceived susceptibility of these species (both individually and collectively) to the anticipated impacts of development. For example, an area would be considered to be of high avifaunal sensitivity if one or more of the following is found (or suspected to occur) within the broader impact zone:				
1) Avifaunal habitat (e.g. a wetlands, nesting or roost sites) of regional or national significance.				
2) A population of a priority species that is of regional or national significance.				
3) A bird movement corridor that is of regional or national significance.				
4) A protected area and / or Important Bird and Biodiversity Area.				
An area would be considered to be of medium avifaunal sensitivity if it does not qualify as high avifaunal sensitivity, but one or more of the following is found (or suspected to occur) within the broader impact zone				
1) Avifaunal habitat (e.g. a wetland, nesting or roost sites) of local significance.				
2) A locally significant population of a priority species.				
3) A locally significant bird movement corridor.				
An area would be considered to be of low avifaunal sensitivity if it does not meet any of the above criteria.				
**** Regime 1 may be applied to some large sites, but only in instances where there is abundant existing data to support the assessment of low sensitivity.				

Bird distribution patterns fluctuate widely in response to environmental conditions (e.g. local rainfall patterns, nomadism, migration patterns, seasonality), meaning that a composition noted at a particular moment in time will differ during another time period at the same locality. For this reason, a dry season and wet season bird monitoring survey will be conducted in line with Regime 2 for the San Solar PV. The dry season survey has already been conducted in February 2022, and the findings have been used to inform the avifauna scoping report completed for the Scoping phase. The result from the wet season bird monitoring will be used to inform both the development footprint as well as Avifauna Impact Assessment report, to be completed for the EIA Report.

5.8.2 The IFC Environmental Health and Safety (EHS) Guidelines

The IFC EHS Guidelines are technical reference documents with general and industry specific examples of Good International Industry Practice (GIIP). The following IFC EHS Guidelines have relevance to the proposed project:

- » IFC EHS General Guidelines
- » IFC EHS Guidelines for Electric Power Transmission and Distribution

The General EHS Guidelines are designed to be used together with the relevant Industry Sector EHS Guidelines, however no Industry Sector EHS Guidelines have been developed for PV solar power to date. The application of the General EHS Guidelines should be tailored to the hazards and risks associated with

a project, and should take into consideration site-specific variables which may be applicable, such as host country context, assimilative capacity of the environment, and other project factors. In instances where host country regulations differ from the standards presented in the EHS Guidelines, whichever is the more stringent of the two in this regard should be applied.

The General EHS Guidelines include consideration of the following:

- » Environmental:
 - * Air Emissions and Ambient Air Quality
 - * Energy Conservation
 - * Wastewater and Ambient Water Quality
 - * Water Conservation
 - * Hazardous Materials Management
 - * Waste Management
 - * Noise
 - * Contaminated Land
- » Occupational Health and Safety:
 - * General Facility Design and Operation
 - * Communication and Training
 - * Physical Hazards
 - * Chemical Hazards
 - * Biological Hazards
 - * Radiological Hazards
 - * Personal Protective Equipment (PPE)
 - * Special Hazard Environments
 - * Monitoring
- » Community Health and Safety:
 - * Water Quality and Availability
 - * Structural Safety of Project Infrastructure
 - * Life and Fire Safety (L&FS)
 - * Traffic Safety
 - * Transport of Hazardous Materials
 - * Disease Prevention
 - * Emergency Preparedness and Response
- » Construction and Decommissioning:
 - * Environment
 - * Occupational Health & Safety
 - * Community Health & Safety

5.7.3 IFC's Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants (2015)

While no Industry Sector EHS Guidelines have been developed for PV Solar Power, the IFC has published a Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants (IFC, 2015). Chapter 8 of the Project Developer's Guide pertains to Permits, Licensing and Environmental Considerations, and states that in order to deliver a project which will be acceptable to international lending institutions, environmental and social assessments should be carried out in accordance with the requirements of the key international standards and principles, namely the Equator Principles and IFC's Performance Standards (IFC PS).

Some of the key environmental considerations for solar PV power plants contained within the Project Developer's Guide include:

- » Construction phase impacts (i.e. OHS, temporary air emissions from dust and vehicle emissions, noise related to excavation, construction and vehicle transit, solid waste generation and wastewater generation from temporary building sites and worker accommodation).
- » Water usage (i.e. the cumulative water use requirements).
- » Land matters (i.e. land acquisition procedures and the avoidance or proper mitigation of involuntary land acquisition / resettlement).
- » Landscape and visual impacts (i.e. the visibility of the solar panels within the wider landscape and associated impacts on landscape designations, character types and surrounding communities).
- » Ecology and natural resources (i.e. habitat loss / fragmentation, impacts on designated areas and disturbance or displacement of protected or vulnerable species).
- » Cultural heritage (i.e. impacts on the setting of designated sites or direct impacts on below-ground archaeological deposits as a result of ground disturbance during construction).
- » Transport and access (i.e. impacts of transportation of materials and personnel).
- » Drainage / flooding (i.e. flood risk associated with the site).
- » Consultation and disclosure (i.e. consulting with key authorities, statutory bodies, affected communities and other relevant stakeholders as early as possible).
- » Environmental and Social Management Plan (ESMP) (i.e. compile an ESMP to ensure that mitigation measures for relevant impacts are identified and incorporated into project construction procedures and contracts).

CHAPTER 6: DESCRIPTION OF THE RECEIVING ENVIRONMENT

This chapter provides a description of the local environment. This information is provided in order to assist the reader in understanding the possible effects of the project on the environment within which the project is proposed to be developed. Aspects of the biophysical, social and economic environment that could be directly or indirectly affected by, or could affect, the San Solar PV facility have been described. This information has been sourced from both existing information available for the area as well as collected field data by specialist consultants and aims to provide the context within which this EIA process is being conducted.

6.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of an Impact Assessment Report

This chapter includes the following information required in terms of Appendix 2: Content of a Scoping report:

Requirement	Relevant Section
(g)(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	<p>The environmental attributes associated with the development of San Solar PV is included within this chapter. The environmental attributes that are assessed within this chapter includes the following:</p> <ul style="list-style-type: none"> » The regional setting of the broader project site and the project site indicates the geographical aspects associated with San Solar PV. This is included in Section 6.2. » The climatic conditions for the greater Lichtenburg area have been included in Section 6.3. » The biophysical characteristics of the project site and the surrounding areas are included in Section 6.4. The characteristics considered are topography and terrain, geology, soils and agricultural potential and the ecological profile which includes the vegetation patterns, listed plant species, critical biodiversity areas and broad-scale processes, freshwater resources, terrestrial fauna and avifauna. » The heritage and cultural aspects (including archaeology and palaeontology) have been included in Section 6.5. » The social and socio-economic characteristics associated with the broader project site and the project site have been included in Section 6.6.

A more detailed description of each aspect of the affected environment will be included in the specialist reports to be included in the EIA report.

6.2. Regional Setting

The San Solar PV facility project site is located approximately 16km north west of the Kathu in the Northern Cape Province. The Northern Cape Province is in the north-western extent of South Africa and constitutes South Africa's largest province, occupying an area of 372 889km² in extent, equivalent to nearly a third (30.5%) of the country's total land mass. The project site falls within the Gamagara Local Municipality within the John Taolo Gaetsewe District Municipality.

The closest towns to the proposed development include Kathu, located approximately 16km north west. Other towns in proximity of the project site include Dibeng located east of the project site. Built infrastructure in the form of farm homesteads and workers quarters occur within and around the project site.

The region is sparsely populated (less than 5 people per km²), with the highest concentrations occurring in the towns of Kathu and Dibeng, and at the Sishen Mine. A number of isolated homesteads occur throughout the project site. This includes but not limited to the Bosaar, Flatlands, Halliford, Selsden, Haakboskerm homestead and restaurant, Limebank, Klein Landbank, Curtis and Dundrum. The Stokkiesdraai guesthouse is located adjacent south west of the proposed San Solar PV facility site.

Prominent/major road systems within the area include the N14 located approximately 3km south of the project site, the R380 located west of the project site. Access to the project site is obtained via the R380 provincial route which branches off the N14 located south of the project site.

In spite of the predominantly rural and natural character of the project site, there are a large number of overhead power lines in the project site, associated mainly with the Ferrum Substation located at the mine. These include:

- » Ferrum-Wincanton 1 132kV
- » Ferrum-Fox 1 132kV
- » Adams-Ferrum 1 132kV
- » Fox-Umtu 1 132kV
- » Impala-Mamatwane 1 132kV

6.3. Climatic Conditions

The Kathu area is typically characterised as having a local steppe climate (BSh) with little rainfall. Precipitation is highest in January with an average of 75mm and lowest in July with an average of 4mm. January is the hottest month of the year with an average temperature of 10.5 °C, while July is the coldest month of the year with an average temperature of 10.5°C (refer to **Figure 6.1**). Frost is frequent to very frequent during winter, with up to 37 mean frost days per year. Droughts and floods are a regular occurrence at both provincial and local scales and play a significant role in almost every aspect of the social, economic, and ecological environment within the province.

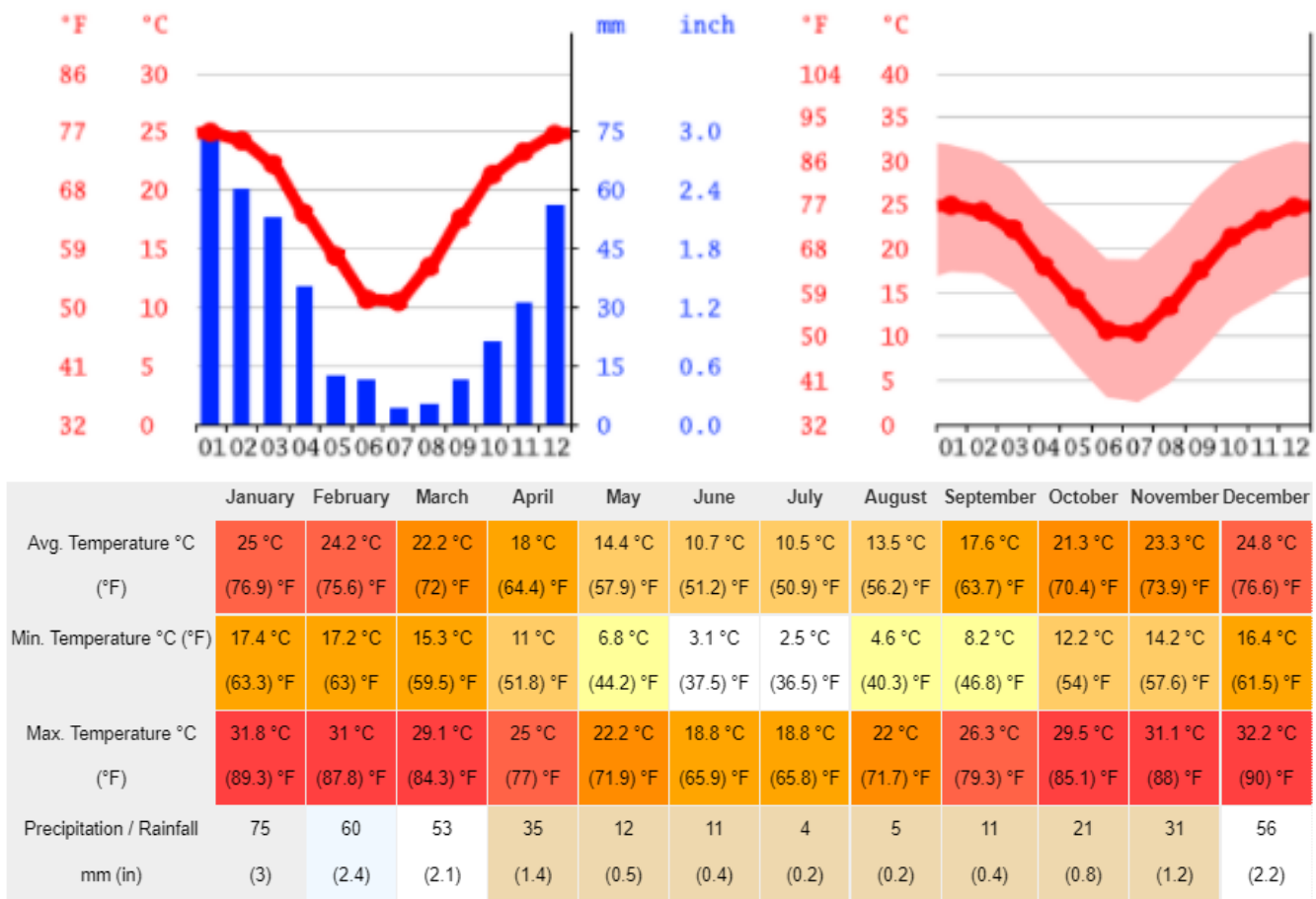
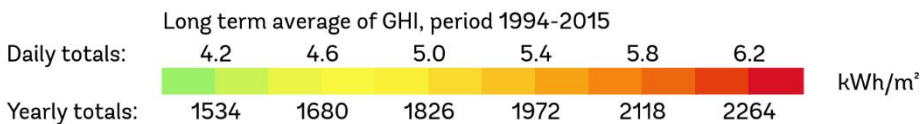
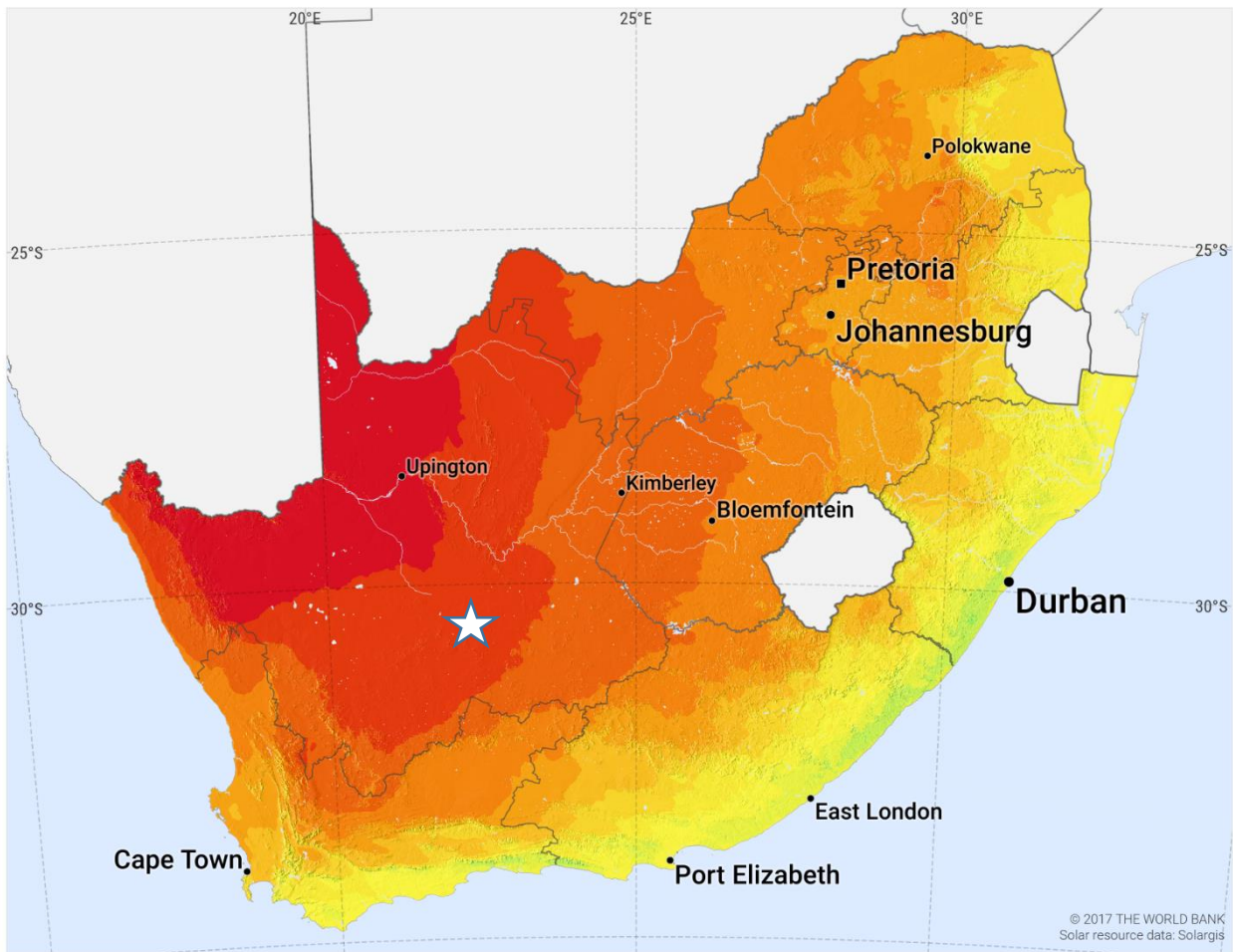


Figure 6.1: Climate and Temperature graphs for Kathu, Northern Cape Province (Source: en.climate-data.org).

The suitability of the site for the development of a solar facility is dependent on the prevailing climatic condition of the area. The viability of the solar farm is directly affected by the amount of solar irradiation received in the area. The Northern Cape Province has the Global Horizon Irradiation (GHI) of approximately 2240 kWh/m²/annum, which relates to the higher end of the spectrum (refer to **Figure 6.2**).

SOLAR RESOURCE MAP

GLOBAL HORIZONTAL IRRADIATION
SOUTH AFRICA



This map is published by the World Bank Group, funded by ESMAP, and prepared by Solargis. For more information and terms of use, please visit: <http://globalsolaratlas.info>.

Figure 6.2: GHI map for South Africa (Source: World Bank Group Solar Map). The location of San Solar PV is shown by the white star on the map

6.4. Biophysical Characteristics of the Project Site

The following section provides an overview of the biophysical characteristics of the project site.

6.4.1. Topographical profile

The topography of the project site is described as plains and elevations range from 1105m in the north-west to 1195m in the south-east of the project site near the Sishen airfield. The entire project site has a very even (flat) slope from the south-east to the north-west. The site itself is located at an average elevation of 1143m above sea level.

6.4.2. **Geology, Soils and Agricultural Potential**

i. Geological profile

The site lies on the northern margin of the Transvaal Basin on the Kaapvaal Craton. The Quaternary Kalahari sands form an extensive cover of much younger deposits over much of the Northern Cape Province and Botswana.

Haddon and McCarthy (2005) proposed that the Kalahari basin formed as a response to down-warp of the interior of the southern Africa, probably in the Late Cretaceous period. This, along with possible uplift along epeirogenic axes, back-tilted rivers into the newly formed Kalahari basin and deposition of the Kalahari Group sediments began. Sediments included basal gravels in river channels, sand and finer sediments. A period of relative tectonic stability during the mid-Miocene saw the silcretisation and calcretisation of older Kalahari Group lithologies, and this was followed in the Late Miocene by relatively minor uplift of the eastern side of southern Africa and along certain epeirogenic axes in the interior. More uplift during the Pliocene caused erosion of the sand that was then reworked and redeposited by aeolian processes during drier periods, resulting in the extensive dune fields that are preserved today.

Tertiary calcretes cover large parts of the Northern Cape, but they are difficult to date and there are several schools of thought (see Partridge et al., 2006). Nonetheless, it is accepted that calcretes form under alternating cycles of humid and arid climatic conditions in strata that have calcium carbonate (Netterberg, 1969). More recent research using geophysical techniques to measure uplift of the continent during the Cretaceous and Tertiary, combined with the fossil record (Braun et al., 2014) suggest that there were two predominant humid periods during the Tertiary. The whole of the Eocene (56-33 Ma) and a short period during the early Miocene (ca 20-19 Ma) were humid according to their estimations. It is possible that the Northern Cape calcretes formed during one of these periods.

Overlying many of these rocks are loose sands and sand dunes of the Gordonia Formation, Kalahari Group of Neogene Age. The Gordonia Formation is the youngest of six formations and is the most extensive, stretching from the northern Karoo, Botswana, Namibia to the Congo River (Partridge et al., 2006). It is considered to be the biggest palaeo-erg in the world. The sands have been derived from local sources with some additional material transported into the basin (Partridge et al., 2006). Much of the Gordonia

Formation comprises linear dunes that were reworked a number of times before being stabilised by vegetation.

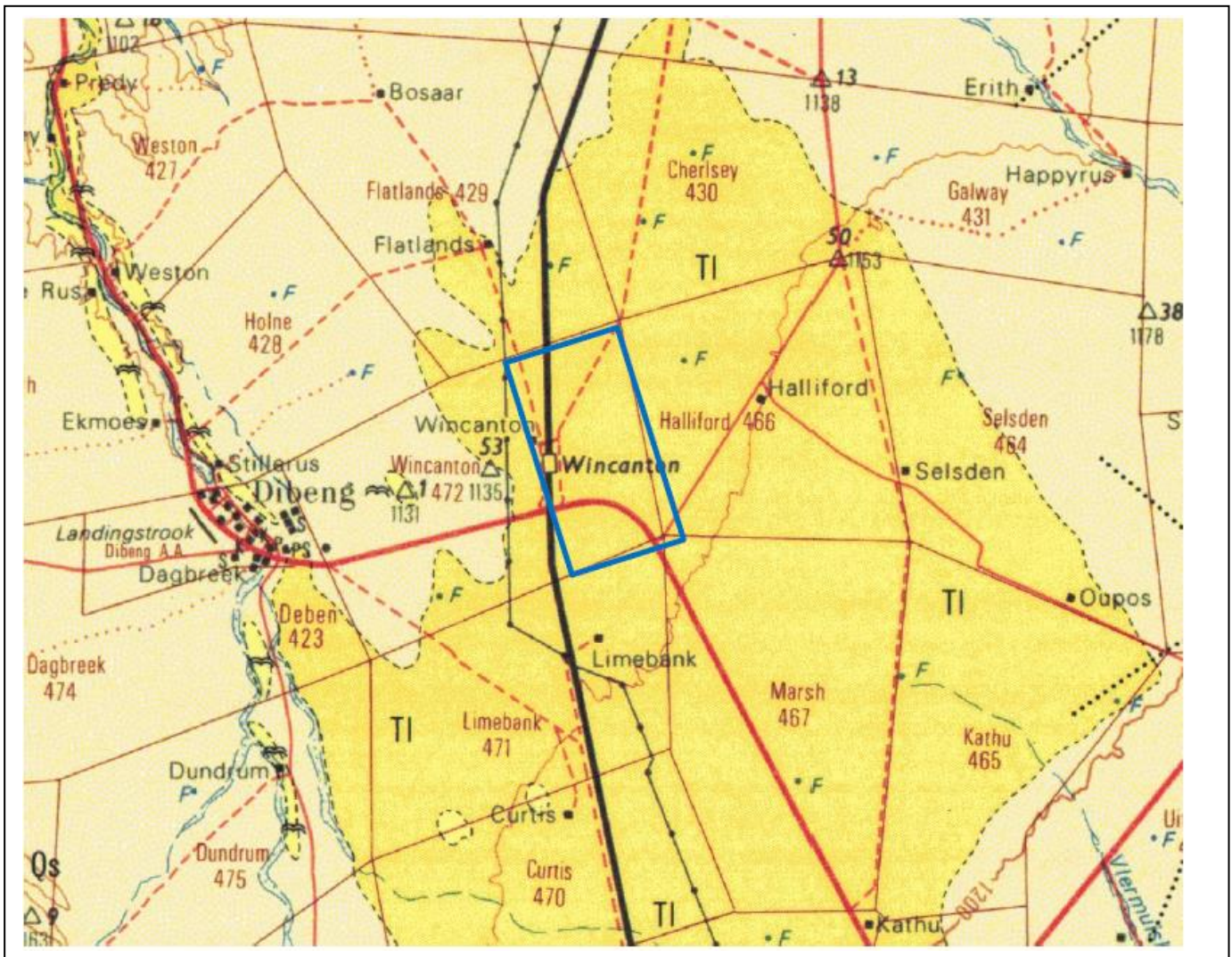


Figure 6.3: Geological map of the area around the Farm Wincanton 472 and the proposed San Solar Facility as indicated within the blue rectangle (source: Map enlarged from the Geological Survey 1: 250 000 map 2722 Kuruman)

ii. Soils and agricultural capability

The entire project site as well as the area bordering on it, falls within Land Type Ag110 (refer to **Figure 6.4** and **Figure 6.5**). Land Type Ag110 consists of only two terrain units, i.e. Terrain units 4 and 5, both with slope ranging between 0 and 2%. This land type represents shallow, rocky soil profiles of the Mispah and Hutton forms that range in depth between 0.02m and 0.3m. Approximately 20% of the toe-slopes and 5% of the valley bottoms consist of deeper Hutton soils that range in depth between 0.45 and 0.90m. Depth limiting materials consist of rock and hardpan carbonate horizons.

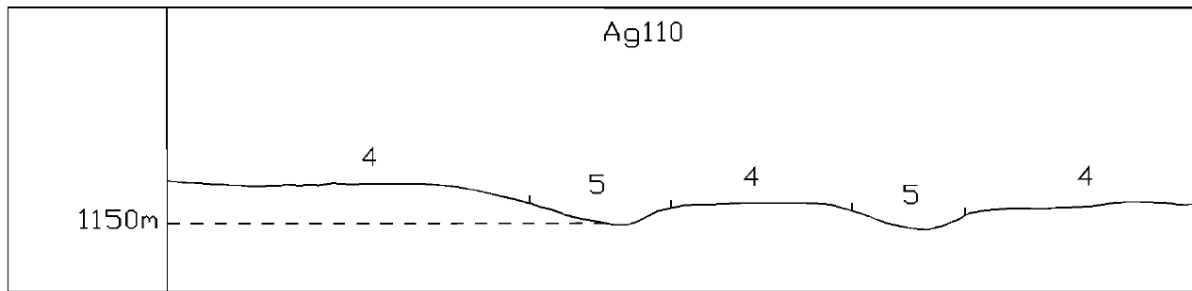


Figure 6.4: Terrain form sketch of Land Type Ag110

Approximately 90% of the area covered by Land Type Ag110 consists of toe-slope positions (Terrain unit 4) while valley bottoms (Terrain unit 5) make up the remaining 10%. The valley bottoms may consist of approximately 3% stream beds.



Figure 6.5: Land type classification of the proposed San Solar PV facility project site

iii. Land use and carrying capacity

The San Solar PV project site consists mainly of land Low (Class 05) land capability with small areas of Low-Moderate (Class 06) land capability present over the entire area. Two very small areas of land with Low-

Very low (Class 04) land capability are present west of the western boundary of the project site. Both the land capability classes within the project site, are indicative that the area is suitable for livestock grazing and is considered not suitable for arable agriculture under rainfed conditions.

There are no field crop boundaries within the project site. The nearest crop field boundaries are approximately 15km away to the northwest of the project site and, consist of fields with rainfed annual crops or planted pastures. Other crop fields with either rainfed crops or planted pastures are located 20km south-east and 25km north-east of the project site. Following this data, there is no risk that rainfed or irrigated crop production will be affected by the proposed development.

As per the metadata layer obtained from DALRRD, the grazing capacity of the entire project site, is 13 ha/LSU (large stock unit). This is considered as low-moderate grazing capacity that requires herd and pasture management to avoid land degradation.

6.4.3. Ecological profile of the project site

i. Broad-Scale Vegetation Patterns

According to the national vegetation map (Mucina & Rutherford 2006), the project site is restricted to the Kathu Bushveld vegetation type (refer to **Figure 6.6**). This vegetation unit occupies an area of 7 443 km² and extends from around Kathu and Dibeng in the south through Hotazel and to the Botswana border between Van Zylsrus and McCarthysrus. In terms of soils the vegetation type is associated with aeolian red sand and surface calcrete and deep sandy soils of the Hutton and Clovelly soil forms. The main land types are Ah and Ae with some Ag. The Kathu Bushveld vegetation type is still considered largely intact and less than 2% has been transformed by mining activity and other development, and it is classified as Least Threatened. However, there has been a recent increase in mining as well as solar development within this vegetation type with the result that it has experienced significant recent habitat loss as well as become increasingly fragmented. It is also poorly conserved and does not currently fall within any formal conservation areas apart from the recently declared Kumba Iron Ore offset areas west of Kathu. Although no endemic species are restricted to this vegetation type, a number of Kalahari endemics are known to occur in this vegetation type such as *Vachellia luederitzii* var *luederitzii*, *Antheophora argentea*, *Megaloprotachne albescens*, *Panicum kalaharensis* and *Neuradopsis bechuanensis*. Other vegetation types that occur in the wider area include Kuruman Thornveld to the east and Kuruman Mountain Bushveld to the south and east, neither of which is of conservation concern or occur within the project site.

Based on the results of a previous assessment (Strobach, 2012), dominant tree species present *Vachellia erioloba*, *Senegalia mellifera*, *Boscia albitrunca*, *Diospyros lycioides*, *Grewia flava*, *Tarchonanthus camphoratus* and *Zizyphus mucronata*. Shrubs present include *Asparagus retrofractus*, *Asparagus suaveolens*, *Barleria rigida*, *Chrysocoma ciliata*, *Pentzia calcarea*, *Pentzia incana* and *Melhania virescens*. Common and dominant grasses include *Aristida adscensionis*, *Aristida congesta*, *Cenchrus ciliaris*, *Enneapogon cenchroides*, *Enneapogon desvauxii*, *Eragrostis nindensis*, *Schmidtia pappophoroides* and *Stipagrostis uniplumis*.

According to the DFFE Screening Tool, the site is considered low sensitivity for the plant species theme. Based on the information available for the site, this is agreeing with the previous assessments that found no species of conservation concern at the site, only the protected tree species, which are not rare species and occur widely.

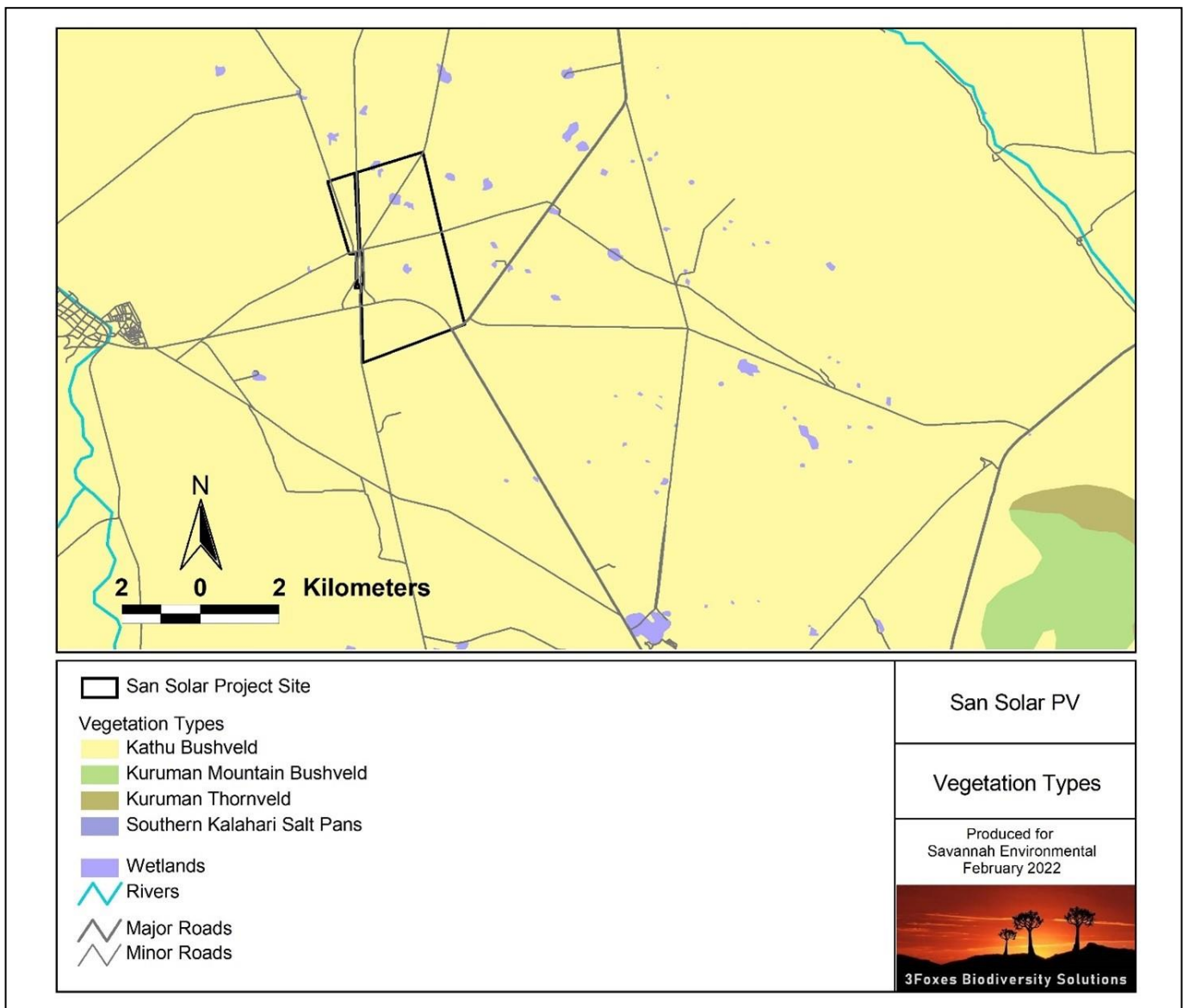


Figure 6.6: Broad-scale overview of the vegetation in and around the San Solar PV site. The site is restricted to the Kathu Bushveld vegetation type with several pans.

ii. Listed and protected plant species

Three NFA-protected tree species occur at the site, *Boscia albitrunca*, *Vachelia erioloba* and *Vachelia haematoxylon*. Based on the results of the walk-through study (Strobach, 2012), which has some limitations, it is estimated that 130 *Vachelia erioloba* trees would be lost to the development, while up to 300 *Boscia albitrunca* would be lost. The transects that were conducted for the walk-through are, however, relatively limited in extent and it is expected that the mean density of *Vachelia erioloba* within the less favourable habitats that dominate the site is between 0.5 and 1 tree per hectare, so based on that density it is estimated that up to 300 *Vachelia erioloba* would be affected. Although no *Vachelia haematoxylon* were observed on the site during the walk-through, it is possible that this species is present at a low density. Apart from these protected tree species, there are also several provincially protected species confirmed present such as *Babiana hypogaea* and *Nerine laticoma*.

iii. Faunal communities

a) Amphibians

The project site lies within or near the range of 10 amphibian species, indicating that the project site potentially has a moderately diverse frog community for an arid area. There is no natural permanent water or artificial earth dams within the project site that would represent suitable breeding habitat for most of these species. The pans which are present at the site would occasionally contain sufficient water for breeding purposes for those species which do not require permanent water. Given the paucity of permanent water at the site, only those species which are relatively independent of water are likely to occur in the area. Species previously observed in the vicinity of the site include Eastern Olive Toad *Amietophrynus garmani* and Bushveld Rain Frog *Breviceps adspersus*, both of which are likely to occur at the project site.

b) Reptiles

The project site lies in or near the distribution range of more than 50 reptile species, although many of these are unlikely to occur at the project site as it is restricted largely to sandy substrate and does not include rocky habitat or other habitats that are important for reptiles. No species of conservation concern are known to occur in the area. The habitat diversity within the project site is relatively low with the result that the number of reptile species present within the project site is likely to be relatively low and only a proportion of the species known from the area are likely to be present on the project site itself.

Species observed on the site or in the immediate area in the past include Serrated Tent Tortoise *Psammobates oculifer*, Cape Cobra *Naja nivea*, Ground Agama *Agama aculeata*, Spotted Sand Lizard *Pedioplanis lineocellata*, Variable Skink *Trachylepis varia*, Bibron's Blind Snake *Afrotyphlops bibronii*, Western Rock Skink *Mabuya sulcata sulcata*, Kalahari Tree Skink *Trachylepis spilogaster*, Cape Gecko *Lygodactylus capensis*, Speckled Rock Skink *Trachylepis punctatissima*, Striped Skaapsteker *Psammophylax tritaeniatum* and Boomslang *Dispholidus typus typus*. Impacts on reptiles are likely to be restricted largely to habitat loss within the development footprint. This is likely to be of local significance only as there are no very rare species or specialised habitats present within the footprint area.

c) Mammals

The mammals community at the project site is likely to be of moderate diversity, although more than 50 species of terrestrial mammals are known from the wider area, the extent and habitat diversity of the project site is too low to support a very wide range of mammals. Species observed or otherwise confirmed present in the area include Aardvark, Cape Porcupine, Springhare, South African Ground Squirrel, Scrub hare, Vervet Monkey, Small-spotted Genet, Yellow Mongoose, Slender Mongoose, Black-Backed Jackal, Steenbok, Duiker and Kudu. Small mammals trapped in the area include Desert Pygmy Mouse *Mus indutus*, Multimammate Mouse *Mastomys coucha*, Bushveld Gerbil *Tatera leucogaster*, Hairy footed Gerbil *Gerbillurus paeba*, Pouched Mouse *Saccostomus campestris* and Grey Climbing Mouse *Dendromus melanotis*.

Five listed terrestrial mammal species potentially occur in the area; these are the Brown Hyaena *Hyaena brunnea* (Near Threatened), Black-footed Cat *Felis nigripes* (Vulnerable), Leopard *Panthera pardus* (VU), Ground Pangolin *Smutsia temminckii* (Vulnerable) and South African Hedgehog *Atelerix frontalis* (Vulnerable). The Leopard and Brown Hyaena are not likely to occur in the area on account of the agricultural land-use in the area which is not usually conducive to the persistence of large carnivores. The

Black-footed Cat is a secretive species which would be likely to occur in the wider area and possibly at the project site given that it occurs within arid, open country. The Hedgehog and Ground Pangolin may also occur in the area at typically low density. Given the extensive national ranges of these species, the impact of the proposed development on habitat loss for these species would be minimal and a long-term impact on these species would be unlikely.

According to the DFFE Screening Tool, the majority of the site is classified as low sensitivity for fauna with some areas of medium sensitivity related to the possible presence of the Secretarybird. In terms of terrestrial fauna, there are several mammals of concern that may be present at the site as mentioned above, but the site is not likely to be of significance for any of these species. This would be confirmed during the site visit for the EIA phase, but it is expected that the site sensitivity for terrestrial fauna would be medium or low sensitivity.

iv. Critical Biodiversity Areas and Broad Scale Processes

The project area is a mix of ESA and "Other natural areas", with no CBAs in close proximity to the site. As per the Northern Cape CBA map, the ESAs are based on the presence of the following features: Kathu Bushveld, Conservation Areas, Wetlands and Landscape Structural Elements. It is not clear what the Conservation Areas being referred to are, as the only formal conservation area in the vicinity is the Kathu Forest Nature Reserve which is some distance from the site. Also, it is not clear why parts of the site are ESA and other parts are not classified, as there is no real difference between these areas in the field. Some of the Other Natural areas have been cleared/transformed in the past. This classification appears to be based on satellite imagery, which is being used to delineate different habitats, with areas of shallow soils falling within the ESAs and deeper sandy soils falling within the other natural areas. In terms of habitat sensitivity, this is difficult to understand as the deeper sands are generally considered to be more sensitive than the shallow soils due to the high density of the protected tree species *Vachelia erioloba* and *Vachelia haematoxylon* that usually characterise these deeper soils. The ESA areas may, therefore, be suggested to be reconsidered based on the field work for this project.

The only protected tree species that tends to be more common on the shallow soils than the deeper sandy soils is *Boscia albitrunca*. In terms of broad-scale ecological processes, there are two large drainage systems in the area, the Ga-Mogara River west of the site and the Vlermuisleegte River east of the site, that would represent broad-scale ecological corridors running through the area. The development would not have an impact on either of these two systems. There would also in principle be some movement of fauna through the site, but as there are no particular features present which would make the site more desirable than adjacent areas, the site is considered typical for the area and is not considered to be of above average significance for faunal movement or other ecological processes. The location of the proposed facility immediately adjacent to an existing PV facility and nearby another is seen as a positive aspect of the current development as concentrating development to within a node may increase local impacts but reduces habitat loss and fragmentation of habitat overall and is seen as being preferred to more dispersed development, especially when the affected habitat is considered relatively low sensitivity.

The ESAs present at the site are reflected as high sensitivity under the Terrestrial Biodiversity Theme of the DFFE Screening Tool. As these are anthropogenic features not closely related to actual features on the ground, it is difficult to verify these features, but based on the available information, there is little ecological basis to support the ESAs at the site as compared to those areas within the site that are not classified as ESA.

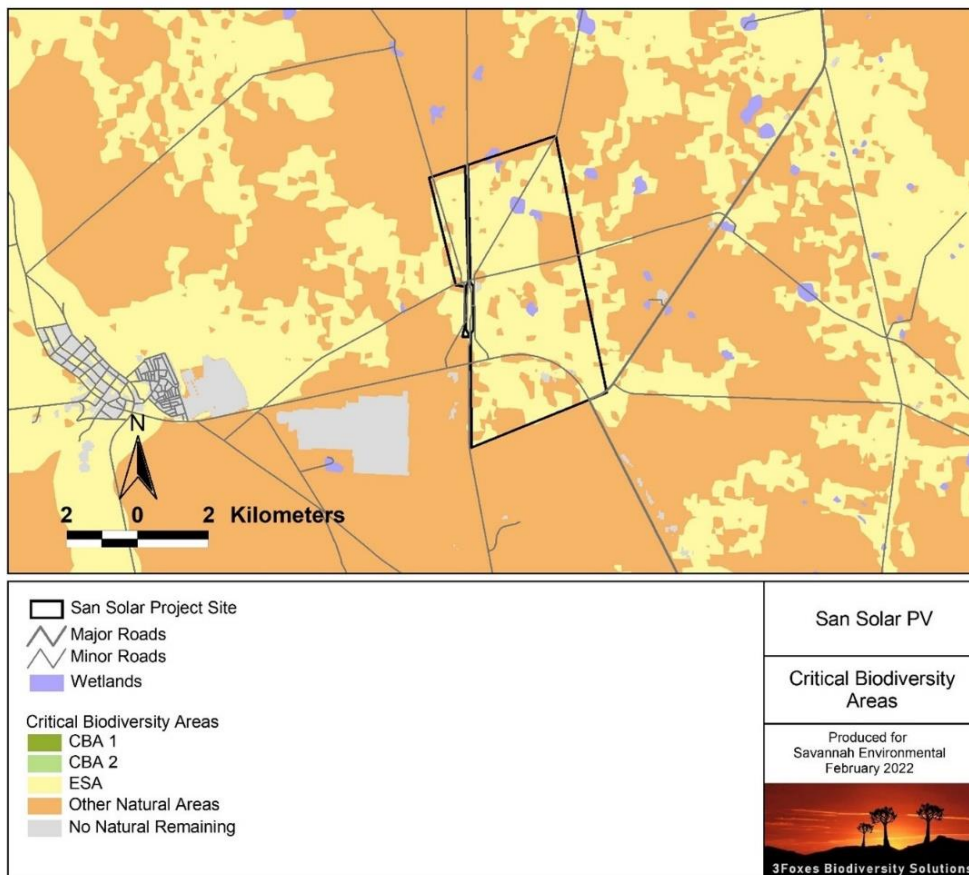


Figure 6.7: Extract of the Northern Cape Critical Biodiversity Areas map for the project site

6.4.4. Avifauna profile for the area

There are no formal protected areas or any Important Bird and Biodiversity Areas in close proximity to the project site. Apart from the regional vegetation type, the local composition and distribution of the vegetation associations on the project site are a consequence of a combination of factors simulated by soil texture, geology and historical disturbance regimes which have culminated in a number of habitat types (refer to **Figure 6.8**).

» Kathu Bushveld

This unit is prominent on the study site and covers a significant extent in surface area of the proposed project site. It is represented by two discrete floristic variations which also provide habitat for two discrete avifaunal associations. The first floristic variation consists of open short shrubland dominated by open short *Senegalia mellifera* - *Tarchonanthus camphoratus* shrubland with a fairly well developed graminoid layer. It is expected to provide habitat for small passerine granivores and leaf-gleaning insectivores, most notably that of Scaly-feathered Weaver (*Sporopipes squamifrons*), Black-chested Prinia (*Prinia flavicans*) and Chestnut-vented Warbler (*Curruca subcoerulea*). Birds of prey are expected to be rare and mainly occurs overhead during hunting bouts. Large-terrestrial species are expected to occur at low densities and will consist of the Red-crested Korhaan (*Lophotis ruficrista*) and Northern Black Korhaan (*Afrotis afraoides*). The average bird density on this habitat type is expected to approximate 10.51 birds. ha⁻¹ with a richness of approximately 20 - 25 species.

The second variation is compositionally similar to the aforementioned habitat types, but it also includes a tree layer consisting of scattered *Vachellia erioloba* trees. The increase in vertical heterogeneity is expected to be positively correlated with species richness. Expected typical species will include Tinkling Cisticola (*Cisticola rufilatus*), Spotted Flycatcher (*Muscicapa striata*) and Southern Masked Weavers (*Ploceus velatus*) which are normally uncommon from the adjacent shrubland. The *V. erioloba* trees also provide perching and potential nesting sites for small to medium-sized birds of prey. The expected average bird density on this variation approximates 12.53 birds. ha⁻¹ and the expected richness is 30 - 40 species.

» Kathu Bushveld on deep red sands

This unit is prominent on the eastern part of the project site. It is represented by dense *Senegalia mellifera* - *Tarchonanthus camphoratus* shrubland on deep red sands. The floristic variation is compositionally similar to the aforementioned habitat type, although the shrub layer is marginally taller and denser. The expected bird density is higher, although richness remained constant when compared to the open Kathu Bushveld. The expected average bird density on this habitat type approximates 13.69 birds. ha⁻¹ and the expected richness is 20 - 30 species.

» Ephemeral pans

These are represented by a number of small basins which tend to hold surface water for a short duration after precipitation events. Surface water is a scarce commodity in arid environments and expected to attract many bird species, both passerines and non-passerines. Therefore, when inundated, the pans may provide ephemeral foraging habitat for a number of nomadic waterbirds and shorebirds which under normal environmental conditions, are absent from the project site (e.g. South African Shelduck *Tadorna cana* and Hadeda Ibis *Bostrychia hagedash*). In most instances the pans are expected to be bordered by dense woody vegetation dominated by *Ziziphus mucronata* and *Vachellia karroo*, thereby providing refuge and perching opportunities for a variety of bird species. The expected average bird density on this habitat type approximates 8.67 birds. ha⁻¹ and the expected richness is 25-35 species.

» Open Kathu Bushveld

These are represented by areas that were historically cleared or were intensively grazed or may represent open bushveld on deep sand (the status of this unit will be evaluated during the detailed surveys). The open woody cover provides foraging opportunities for a variety of large terrestrial bird species, many being threatened or near threatened such as the Secretarybird (*Sagittarius serpentarius*) and Kori Bustard (*Ardeotis kori*).

» Artificial livestock watering points

These are represented by artificial water troughs and reservoirs with the purpose to provide drinking water to livestock. However, they act as focal congregation areas for many granivore passerine species. This habitat feature often sustains high bird richness and also provides foraging habitat for bird of prey.

» Transformed areas (including quarries)

These areas are represented by roads, old homesteads and quarries. These often provide habitat for generalist/unspecialised bird species.

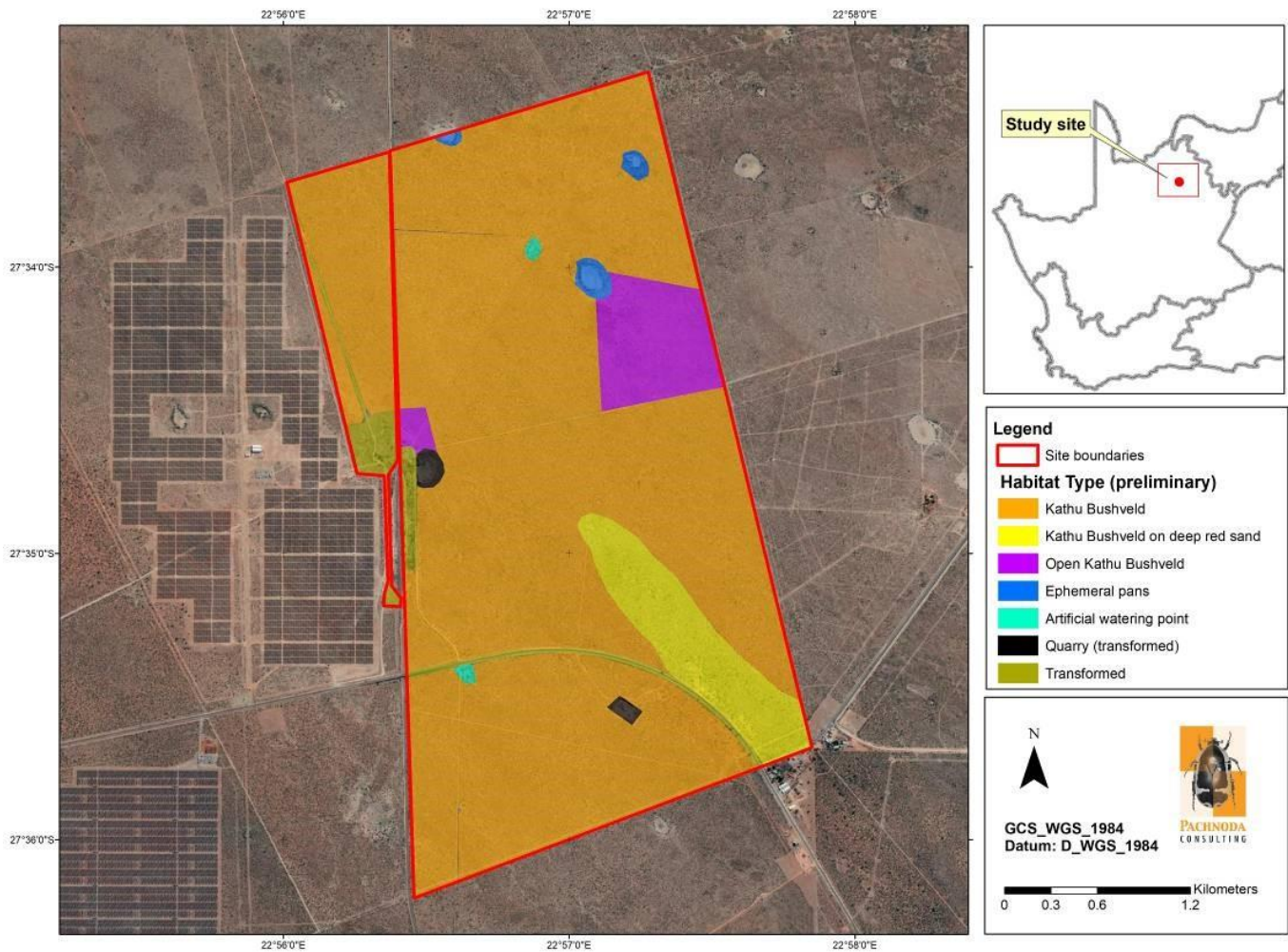


Figure 6.8: A preliminary habitat map illustrating the avifaunal habitat types on the project site

i. Avian species richness and predicted summary statistics

Approximately 145 bird species²² are expected to occur on the study site and immediate surroundings (refer to **Table 6.1**). The expected richness was inferred from the South African Bird Atlas Project (SABAP1 & SABAP2) and the presence of suitable habitat in the project site. The expected richness is also strongly correlated with favourable environmental conditions (e.g. during good rains when the pans are filled with surface water) and seasonality (e.g. when migratory species are present during the austral summer). This equates to 15 % of the approximate 985²³ species listed for the southern African subregion²⁴ (and approximately 17% of the 857 species recorded within South Africa²⁵). However, the species richness obtained from the pentad grids 2730_2255 and 2735_2255 corresponding to the project site is lower than the expected number of species for the projects site with an average of 47.5 species recorded. The average number of species for

²² According to pentad grid 2730_2255 and eight surrounding pentad grids (50 submitted cards, 35 being full protocol cards and 15 being ad hoc cards).

²³ *sensu* www.zestforbirds.co.za (Hardaker, 2020)

²⁴ A geographical area south of the Cunene and Zambezi Rivers (includes Namibia, Botswana, Zimbabwe, southern Mozambique, South Africa, Swaziland and Lesotho).

²⁵ With reference to South Africa (including Lesotho and Swaziland (BirdLife South Africa, 2018).

each full protocol card submitted (for observation of two hours or more) is 30.8 species (range = 28 - 40 species).

As indicated in **Table 6.1**, the study site is poorly represented by biome-restricted²⁶ (refer to **Table 6.2**) and local endemic bird species. However, the expected number of regional near-endemic species is high with ca. 50 % of the near-endemic species being present. In addition, the number of expected threatened and near threatened species is low.

Table 6.1: A summary table of the total number of species, Red listed species (according to Taylor et al., 2015 and the IUCN, 2021), endemics and biome-restricted species (Marnewick et al., 2015) expected (*sensu* SABAP1 and SABAP2) to occur in the project site.

Description	Expected Richness Value
Total number of species	145 (17 %)
Number of Red Listed species*	3 (2 %)
Number of biome-restricted species – Zambezi and Kalahari-Highveld Biomes)	5 (15 %)
Number of local endemics (BirdLife SA, 2018)	0 (0 %)
Number of local near endemics (BirdLife SA, 2018)	4 (13 %)
Number of regional endemics (Hockey et al., 2005)	12 (11 %)
Number of regional near endemics (Hockey et al., 2005)	31 (51 %)

* Only species in the geographic boundaries of South Africa (including Lesotho and Swaziland) were considered.

Table 6.2: Expected biome-restricted species (Marnewick et al, 2015) likely to occur on the study site.

Species	Kalahari-Highveld	Namib-Karoo	Zambezi	Expected Frequency of occurrence
Kalahari Scrub-robin (<i>Cercotrichas paena</i>)	X			Common
Barred Wren-Warbler (<i>Calamonastes fasciolatus</i>)	X			Fairly Common
Burchell's Sandgrouse (<i>Pterocles burchelli</i>)	X			Uncommon
Layard's Warbler (<i>Curruca layardi</i>)		X		Uncommon to Rare
White-bellied Sunbird (<i>Cinnyris talatala</i>)			X	Common

ii. Bird species of conservation concern

Table 6.3 provides an overview of bird species of conservation concern that could occur on the study site based on their historical distribution ranges and the presence of suitable habitat. Only three species could occur on which includes one globally threatened species (Martial Eagle *Polemaetus bellicosus*), one globally near threatened species (Kori Bustard *Ardeotis kori*) and one regionally threatened species (Lanner Falcon *Falco biarmicus*).

It is evident from **Table 6.3** that these species occur at low reporting rates (< 5% for full protocol cards and <10 % for ad hoc cards submitted), which suggests that these species are irregular visitors to the project site. However, the Kori Bustard (*Ardeotis kori*) may be under-recorded in the area (due to the low number of citizen scientists) that have visited the area for which suitable habitat is provided by the open Kathu Bushveld units.

Table 6.3: Bird species of conservation concern that could utilise the study site based on their historical distribution range and the presence of suitable habitat. Red list categories according to the IUCN (2021) and Taylor et al. (2015).

²⁶ A species with a breeding distribution confined to one biome. Many biome-restricted species are also endemic to southern Africa.

Species	Global Conservation Status*	National Conservation Status**	Mean Reporting rate: SABAP2 (n=50)	Preferred Habitat	Potential Likelihood of Occurrence
<i>Falco biarmicus</i> (Lanner Falcon)	-	Vulnerable	2.63 (single observation)	Varied, but prefers to breed in mountainous areas	An irregular foraging visitor to the project site. Most recent record obtained during June 2009 (sensu SABAP2).
<i>Polemaetus bellicosus</i> (Martial Eagle)	Endangered	Endangered	8.33 (single ad hoc observation)	Varied, from open karroid shrub to lowland savanna.	An irregular foraging visitor. It was last recorded on 18 August 2020 on the project site
<i>Ardeotis kori</i> (Kori Bustard)	Near threatened	Near threatened	2.63	Open savannah grassland and open secondary shrubland	An uncommon foraging and breeding resident. It was last recorded during October 2021 from the project site.

6.5. Integrated Heritage including Archaeology, Palaeontology and the Cultural Landscape

6.5.1. Historical, Archaeological and Built Environment Heritage

The town of Kathu was established in the 1960's and 1970's as a result of the iron ore mining taking place at the neighbouring Sishen mine. It is important to note that the Grade I Kathu Pan Archaeological site lies approximately 10km southeast of the proposed development. At Kathu Pan, evidence of early hominin occupation has been observed at multiple sinkhole sites within the pan, and the results of scientific investigation into these sites has been broadly published. These sites are known for their rich collection of Early Stone Age artefacts, and several Archaeological and Heritage Impact Assessments have recorded the area. These archaeological resources occur in areas associated with outcrops of banded ironstone, and the localised natural pan, with most coming specifically from sinkholes in the pan itself.

The area proposed for the San Solar PV Facility is located immediately adjacent to an existing PV facility to the west. As such, it is not anticipated that the development will have a negative impact on any significant cultural landscape in the area due to the existing similar infrastructure here. Furthermore, it is often preferred to have development such as PV facilities clustered in one area to mitigate the sprawl of this infrastructure across otherwise pristine landscapes.

Gaigher (2013) conducted an assessment for the San Solar Energy Facility located north of Kathu on a Portion of the Farm Wincanton 472 - for this exact development proposal (SAHRIS NID 110765). According to Gaigher (2013), "One site for the placement of Solar Array generation plant was investigated. Due to the topographic requirements of Solar Arrays the areas are by nature flat and featureless with limited possibilities of water intrusion. Traditionally people have congregated in areas where shelter is found in some geographic feature or in areas that are elevated above the surrounding landscape. Accesses to water sources are also a deciding factor in the location of occupational sites. None of these factors were present in the areas investigated. Some dry dongas were located in some of the sites; however, these are not reliable sources of water. The area could still contain the remains of nomadic hunter/gatherer camps and some areas with suitable substrates could have been used as quarries for material to produce Stone Age tools. No such sites were however identified. We should however in this case apply the rule of Absence of Evidence is not Evidence of Absence."

Gaigher (2013) did note the presence of some poorly defined quartz stone artifacts. No cores or manufacturing amounts of flakes could be identified. It is believed that these tools are the result of alluvial relocation from a more prominent site, possibly within the river valley. The amount and composition of the finds does not warrant the site being described as a tool location site. Gaigher (2013) also noted the presence of railway related structures located outside of the project site to the west, but these were neither described, photographed nor indicated on any map. Based on the information included in Gaigher (2013), it is not anticipated that the proposed development of solar PV facilities in this area will have a negative impact on significant archaeological heritage. Due to the proximity to Kathu Pan site, and the similar geology of the area, there remains the possibility of the Early Stone Age landscape that is renowned from the Kathu Pan sites extending into this project site. Such archaeology may not be visible from the ground surface and may only become evident during the process of excavation.

6.5.2. Palaeontology

The Tertiary calcretes can trap fossils and artefacts when associated with palaeo-pans or palaeo-springs (Partridge et al., 2006). Where deflation has occurred, for example along the west coast of South Africa, any trapped materials in the different levels can be concentrated in the depo-centre of the pan or dune and therefore it can be challenging to interpret the deposit (Felix-Henningsen et al., 2003). A well-known example of a limestone tufa deposit is at the Buxton-Norlim Limeworks about 15m southwest of Taung, on the margin of the Ghaap Plateau. Fauna and the Taung child cranium were excavated from here, but it should be noted that the topography of this fossiliferous site is very diverse and includes a now roofless cave complex (Hopley et al., 2013). In contrast, the limestones north of Kathu are generally more or less flat.

The Aeolian sands of the Gordonia Formation do not preserve fossils because they have been transported and reworked, but in some regions, these too may have covered pan or spring deposits and these can trap fossils, and more frequently archaeological artefacts. Usually, these geomorphological features can be detected using satellite imagery. No such features are visible.

6.6 Visual Quality

The Ga-Mogara non-perennial river (a dry river-bed for most of the year) is considered to be the main regional drainage feature located within this arid region. The land cover is predominantly grassland and low shrubland with large areas of open woodland in the north-east of the project site, and also scattered throughout the south-west. The vegetation type is Kathu Bushveld of the Eastern Kalahari Bushveld Bioregion, within the Savanna Biome. Bare rock and soil also occur in places such as the dry Ga-Mogara floodplain. Significant tracts of land south of the project site area have been transformed by mining and prospecting activities.

In spite of the predominantly rural and natural character of the project site, there are a large number of overhead power lines in the project site, associated mainly with the Ferrum Substation located at the mine. These include:

- » Ferrum-Wincanton 1 132kV
- » Ferrum-Fox 1 132kV
- » Adams-Ferrum 1 132kV
- » Fox-Umtu 1 132kV
- » Impala-Mamatwane 1 132kV

There are no designated protected areas within the region and no major tourist attractions or destinations were identified within the project site (other than the Haakboskern restaurant and Stokkiesdraai guesthouse located adjacent (south - west) of the project site).

The pictures below aid in describing the general environment within the project site and the area surrounding the project site.



Figure 6.9: General environment within the project site and the surrounding area

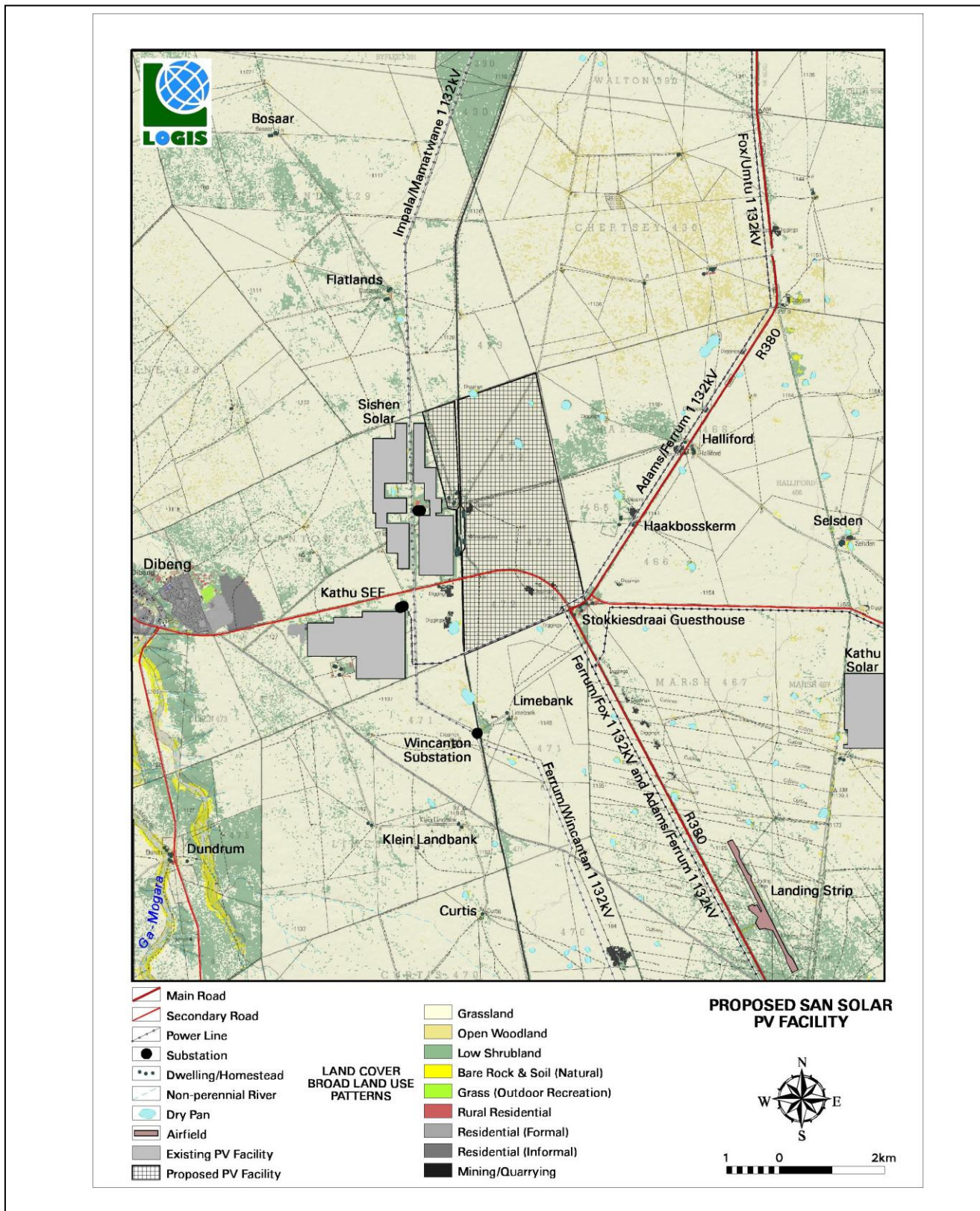


Figure 6.10. Land cover and broad land use patterns of the San Solar PV facility

6.7 Social Context

Table 6.4 provides a baseline summary of the socio-economic profile of the Gamagara LM within which the San Solar PV Facility is located. In order to provide context against which the LM's socio-economic profile can be compared, the socio-economic profiles of the John Taolo Gaetsewe DM, Northern Cape Province, and South Africa as a whole have also been considered. The data presented in this section have been derived from the 2011 Census, the Local Government Handbook South Africa 2019, the Northern Cape Provincial Spatial Development Framework (PSDF), and the John Taolo Gaetsewe DM and Gamagara LM IDPs.²⁷

Table 6.4: Baseline description of the socio-economic characteristics of the area proposed for San Solar PV

Location characteristics
<ul style="list-style-type: none"> » The project is proposed within the Northern Cape Province, which is South Africa's largest, but least populated Province. » The project is proposed within the Gamagara LM of the John Taolo Gaetsewe DM. » The Gamagara LM is approximately 2619km² in extent, equivalent to approximately 10% of the John Taolo Gaetsewe DM.
Population characteristics
<ul style="list-style-type: none"> » Between 2011 and 2016 the Gamagara LM experienced a population growth rate of 28.93% over 5 years. » The Gamagara LM has a high urbanisation rate of 97.6%, which is significantly higher than that of the DM (24.9%). The main reason for the high rate is due to the Gamagara LM being a mining hub and individuals are moving in to the area seeking employment opportunities. » The Gamagara LM is male dominated, with males comprising approximately 56.4% of the LM population. The John Taolo Gaetsewe DM is female dominated, with females comprising approximately 50.8% of the DM population. » Black Africans comprise the predominant population group within the Gamagara LM and John Taolo Gaetsewe DM. » The Gamagara LM, John Taolo Gaetsewe DM, and Northern Cape provincial, and South African national population age structures are all youth dominated. A considerable proportion of the respective populations therefore comprise individuals within the economically active population between the ages of 15 and 64 years of age
Economic, education and household characteristics
<ul style="list-style-type: none"> » The Gamagara LM has a dependency ratio of 34.2, which is lower than the John Taolo Gaetsewe DM (57.9), Northern Cape Province (35.8), and South Africa (34.5). » Education levels within the Gamagara LM are low with approximately 33% of the population aged 20 years and older who have completed Grade 12 / Matric. Only 10.8% of the age group have received higher education. This implies that the majority of the population can be expected to have a relatively low-skill level and would either require employment in low-skill sectors, or skills development opportunities in order to improve the skills level of the area. » The unemployment rate of the Gamagara LM (17.7%) is lower than that of the John Taolo Gaetsewe DM (29.7%). » Approximately 32% of people in the Gamagara LM have no monthly income. At least 64% of the population are earning less than R6400 per month. The area can therefore be expected to have a high poverty level with associated social consequences such as not being able to pay for basic needs and services and poor living conditions. » The main economic sectors of the Gamagara LM includes mining, game farming and business services.

²⁷ While information was derived from the Local Government Handbook South Africa 2019, Northern Cape PSDF, John Taolo Gaetsewe DM and Gamagara LM IDPs, these sources largely make use of statistical information derived from the Census 2011. The information presented in this Chapter may therefore be somewhat outdated, but is considered sufficient for the purposes of this assessment (i.e. to provide an overview of the socio-economic characteristics against which impacts can be identified and their significance assessed).

- » 43% of employed people in the Gamagara LM are employed in the formal sector, of which 5% are employed in the informal sector.
- » As of 2016 there were a total of 15 723 households within the Gamagara LM. This is equivalent to 21.7% of the total number of households within the John Taolo Gaetsewe DM (72 310), and 5% of the total number of households within Northern Cape Province (313 402).
- » The majority of households within the Gamagara LM comprise of houses or brick houses, informal dwellings (i.e. shacks), a flat or house in a backyard, townhouse and flat or apartment in a block of flats.

Services

- » The Gamagara LM achieved to provide the following household services:
 - * 80.8% have access to flush toilet connected to sewerage;
 - * 8.9% have weekly refuse removal;
 - * 52% have access to piped water inside a dwelling; and
 - * 88.1% have electricity for lighting.

6.7.1 Settlement and infrastructure

The region is sparsely populated (less than 5 people per km²), with the highest concentrations occurring in the towns of Kathu and Dibeng, and at the Sishen Mine. In addition to the towns and the mine settlements, a number of isolated homesteads occur throughout the project site. Some of these in the project site include²⁸:

- » Bosaar
- » Flatlands
- » Halliford
- » Selsden
- » Haakboskerm homestead and restaurant
- » Limebank
- » Klein Landbank
- » Curtis
- » Dundrum

The Stokkiesdraai guesthouse is located adjacent (south-west) of the proposed San Solar PV facility site. The road (R380) between Dibeng and Kathu cuts across the southern portion of the property. This road links Dibeng and Kathu with the N14. The eastern boundary of the southern section of site is formed a railway line which runs in a north-south direction. Significant tracts of land in the south of the study area have been transformed by mining and prospecting activities.

Cattle and game farming is undertaken within the project site, with very little agricultural activity due to the scarcity of perennial water (for irrigated agriculture) and the low annual rainfall (for dryland agriculture).

Infrastructure in the region is focussed on the Anglo America Kumba iron ore mine located south-west of Kathu. The expansion of the town of Kathu and most of the larger settlements within the project site are mainly attributed to the mine. Infrastructure closer to the proposed San Solar PV facility includes the Kathu Solar PV, Kathu Solar Energy Facility (SEF) and the Sishen Solar PV facilities.

²⁸ The names listed below are of the homestead or farm dwelling as indicated on the SA 1: 50 000 topographical maps and do not refer to the registered farm name.

CHAPTER 7: SCOPING OF POTENTIAL ISSUES

This Chapter provides an overview of the potential impacts and risks associated with the San Solar PV facility, including the BESS and associated infrastructure, as identified at this stage of the process through specialist studies.

Potential environmental impacts and risks associated with the development of PV solar energy generation facilities, as described in the IFC's Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants (2015), include:

- » Construction phase impacts, such as temporary air emissions (dust and vehicle emissions), noise, solid waste and wastewater generation, and Occupational Health and Safety (OHS) issues such as the risk of preventable accidents leading to injuries and/or fatalities.
- » Land matters, such as land acquisition procedures and in particular involuntary land acquisition/resettlement.
- » Landscape and visual impacts, such as the visibility of the project within the wider landscape and associated impacts on landscape designations, character types and surrounding communities.
- » Ecology and natural resources, such as habitat loss / fragmentation, impacts on designated areas and disturbance or displacement of protected or vulnerable species.
- » Cultural heritage, such as impacts on the setting of designated sites or direct impacts on below-ground archaeological deposits as a result of ground disturbance during construction.
- » Transport and access, such as impacts associated with the transportation of materials and personnel on project-affected communities.
- » Water usage, such as the cumulative water use requirements in arid areas where local communities rely on scarce groundwater resources.

This chapter serves to describe and evaluate the identified potential environmental impacts relevant and specific with the construction and operation phases of the 100MW San Solar PV facility, and to make recommendations for further studies required to be undertaken in the EIA phase.

The project site considered for the San Solar PV facility falls within the Remaining extent of the Farm Wincanton 472, an area of approximately 991.5ha in extent. This project site has been investigated during this Scoping Phase to determine the environmental suitability of the site. The study will provide an indication of those areas of sensitivity that the developer would need to take into consideration and avoid in the planning of the development area and layout of the San Solar PV facility.

The majority of the environmental impacts are expected to occur during the construction phase. Environmental issues associated with construction and decommissioning activities of the PV facility and associated infrastructure are similar and include, among others:

- » Impact on ecology, including flora and fauna.
- » Impact on avifauna.
- » Impact on soils, geology, agricultural potential and land use.
- » Impact on heritage resources (including archaeology and palaeontology).
- » Social impacts (positive and negative).
- » Visual impacts.

Environmental issues specific to the operation of the PV facility and associated infrastructure could include, among others:

- » Long-term loss of protected species (flora, fauna, avifauna) or conservation-worthy habitats.
- » Change in land-use for the footprint of the facility.
- » Visual impacts (negative viewer perceptions and visibility of the facility).
- » Social impacts (positive and negative).

In order to appropriately identify, assess and, as far as possible, avoid or mitigate potential impacts and risks that may be associated with the development, construction, operation and decommissioning of San Solar PV, Savannah Environmental commissioned a team of independent specialists with relevant scientific knowledge and expertise in the biophysical (i.e. biotic and abiotic) and socio-economic environments. Copies of the specialists' Scoping level assessments are included in **Appendices D – I** of this Scoping Report.

Section 7.3 provides the findings of the scoping study undertaken for the construction and operation phases of San Solar PV. Those impacts associated with construction can also be expected to be associated with the decommissioning phase (however, to a lesser extent as the project site would have previously undergone transformation and disturbance during construction). The findings must be read in conjunction with the specialist reports attached as **Appendices D – I** of this Scoping Report. Potential impacts associated with the project are evaluated, and recommendations are made regarding further studies required within the EIA Phase.

A summary of the potential cumulative impacts that may be associated with the project are provided in **Section** Error! Reference source not found.. These impacts are associated with the scale of the project when considered together with other similar developments within the region and will be confirmed and assessed within the EIA Phase of the project.

7.1 Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of an Impact Assessment Report

This chapter identifies the potential environmental impacts associated with the development of San Solar PV. This chapter includes the following information required in terms of the EIA Regulations, 2014 - Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
(g)(v) the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified 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.	The impacts and risks identified to be associated with the construction and operation phase of San Solar PV have been included in Section 7.3 . Impact tables have been included for each field of study which considers the nature, significance, consequence, extent, duration and probability of the impacts, as well the reversibility of the impacts, the loss of resources and avoidance, management or mitigation.
(g)(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.	The positive and negative impacts associated with San Solar PV have been included in Section 7.3 .

Requirement	Relevant Section
(g)(viii) the possible mitigation measures that could be applied and level of residual risk	Possible mitigation (specifically relating to the avoidance of sensitive areas) has been included in Section 7.3 .

7.2 Assumptions made during the Evaluation of Potential Impacts

While evaluating potential impacts associated with the proposed project, the Scoping evaluation assumed the following:

- » All information provided by the developer and I&APs to the environmental team was correct and valid at the time it was provided.
- » The Scoping Phase evaluation of impacts has been largely based on desktop studies and available data within the proposed area. This information has been used to inform this Scoping report and will be verified by specialists in the EIA phase to assess the project development footprint for San Solar PV.
- » It is assumed that the planned development area (400ha area) for the solar PV facility to be identified by the developer will represent a technically suitable site for the establishment of San Solar PV considering both technical and environmental constraints.
- » The development footprint (the area that will be affected during the operation phase) will include the footprint for the PV facility and associated infrastructure (i.e. internal access roads, BESS and grid connection infrastructure).

7.3 Evaluation of Potential Impacts associated with the Construction Phase, Operation and Decommissioning phases

7.3.1 Impacts on ecology (including flora and fauna)

Potential ecological impacts resulting from a variety of different activities and risk factors associated with the preconstruction, construction and operational phases of the project including the following:

» **Impacts on vegetation and protected plant species**

Several protected species occur at the project site which may be impacted by the proposed development, most notably *Vachellia erioloba* and *Boscia albitrunca*. Vegetation clearing during construction will lead to the loss of currently intact habitat within the proposed development footprint and is an inevitable consequence of the development. As this impact is certain to occur it will be assessed for the construction phase as this is when the impact will occur, although the consequences will persist for a long time after construction.

» **Direct faunal impacts**

Increased levels of noise, pollution, disturbance and human presence during construction will be detrimental to fauna. Sensitive and shy fauna would move away from the area during the construction phase as a result of the noise and human activities present, while some slow-moving species would not be able to avoid the construction activities and might be killed. Some impact on fauna is highly likely to occur during construction as well as operation and this impact will therefore be assessed for the construction phase and operational phase.

» **Habitat degradation due to Alien plant invasion and erosion**

The disturbance created during construction would leave the site vulnerable to degradation due to erosion and alien plant invasion. Soil disturbance associated with the development will render the impacted areas vulnerable to erosion and measures to limit erosion will need to be implemented. Similarly, the disturbance associated with the construction phase of the project will render the disturbed areas vulnerable to alien plant invasion. Some woody aliens such as *Prosopis* are already present in the area and additional alien plant invasion following construction is likely and regular alien plant clearing activities would be required. This impact would manifest during the operation phase, although some of the required measures to reduce this impact are required during construction.

» **Impact on ESAs and broad-scale ecological processes**

Although there are no CBAs within the site, a large proportion of the site consists of Ecological Support Areas. Transformation of intact habitat within the ESAs on a cumulative basis would contribute to the fragmentation of the landscape and would potentially disrupt the connectivity of the landscape for fauna and flora and impair their ability to respond to environmental fluctuations. Due to the presence of a number of other renewable energy and mining developments in the area, this is a potential cumulative impact of the development.

Sensitivity Analysis of the Site

A preliminary sensitivity map was compiled illustrating the areas of low, medium and high sensitivity as well as the location of where the larger trees are located on the site. (refer to **Figure 7.1**).

The majority of the site consists of typical Kathu Bushveld dominated by *Senegalia mellifera* and *Tarchonanthus camphoratus*, which is considered low sensitivity on account of the generally low abundance of species of concern. In the south of the site, there is an area of deeper sands with a higher abundance of *Vachellia erioloba* which is considered High sensitivity, and which should preferably be avoided by the PV development area. Across the rest of the site there are several small ephemeral pans present, of which the larger pans are considered Very High sensitivity and the smaller pans High sensitivity. The larger pans should be avoided by the development area, but the ecological significance of the smaller pans is relatively low, and it would not significantly increase the impact of the development of some of these smaller pans were lost to the development. Overall, provided that the PV development area/footprint can be accommodated within the lower sensitivity parts of the site, the impact of the development would be relatively low and would be considered acceptable.

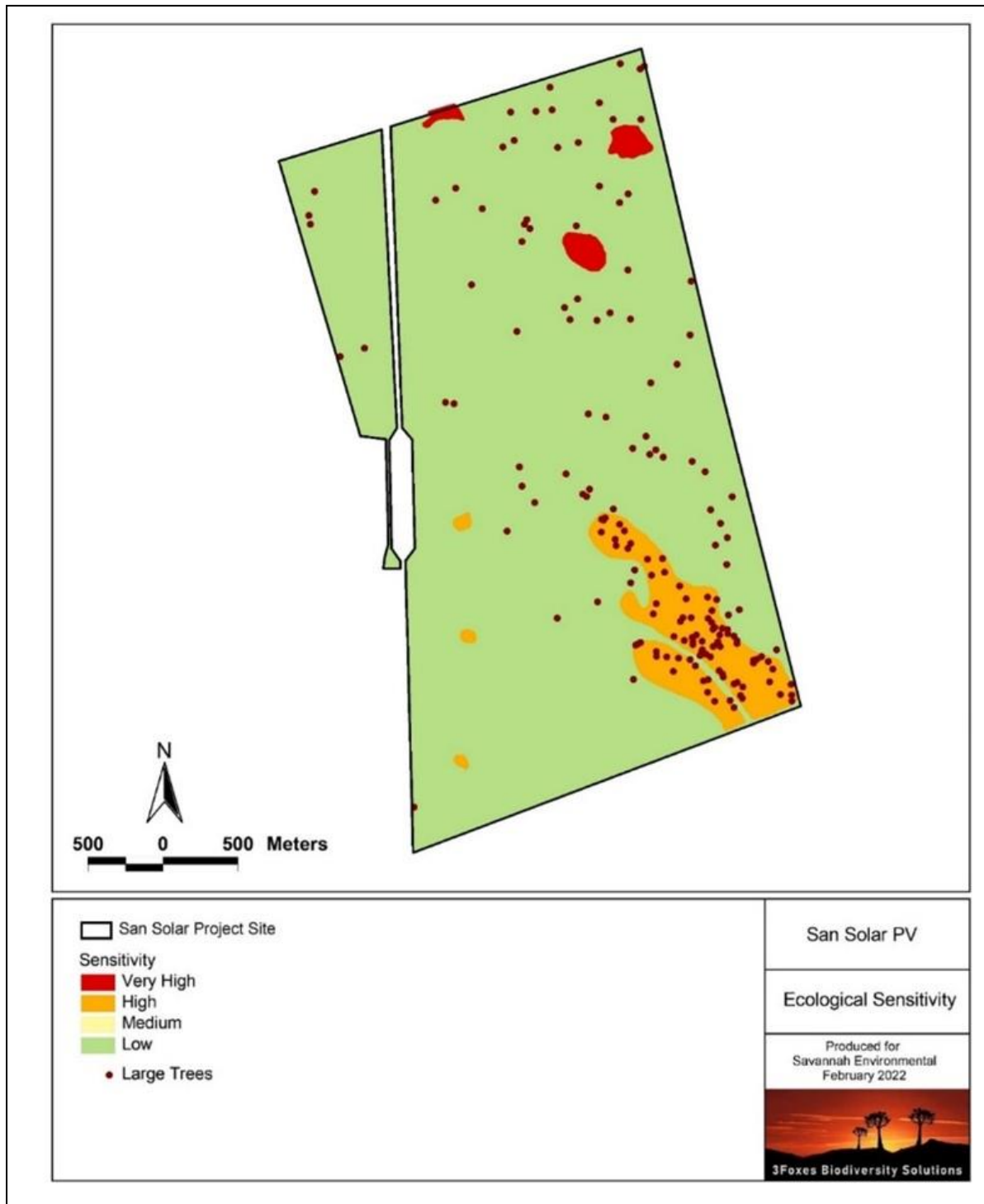


Figure 7.1. Preliminary ecological sensitivity map of the full extent of the San Solar PV project site

Impacts	Nature of Impact	Extent of Impact	No-Go Areas
Disturbance or loss of threatened /protected plants.	Impacts on vegetation will occur due to disturbance and vegetation clearing associated with the construction of the facility. In addition, there will be loss of individuals of protected tree species.	Local	Area of deeper sands with a higher abundance of <i>Vachellia erioloba</i> located south of the site and larger ephemeral pans located north of the site.
Loss of habitat for fauna species.	Disturbance, transformation and loss of habitat will have a negative effect on resident fauna during construction. Due to noise and operation of heavy machinery, faunal disturbance will extend well beyond the footprint and extend into adjacent areas. This will however be transient and restricted to the construction phase.	Local	None identified at this stage.
Impact on ESAs and Vegetation Broad-scale ecological processes	Transformation and presence of the facility will contribute to cumulative habitat loss within ESAs and impacts on broad-scale ecological processes such as fragmentation.	Local	Area of deeper sands with a higher abundance of <i>Vachellia erioloba</i> located south of the site and larger ephemeral pans located north of the site..
Faunal impacts due to operation	The operation and presence of the facility may lead to disturbance or persecution of fauna within or adjacent to the facility.	Local	None identified at this stage.
Habitat degradation due to erosion and alien plant invasion during operation	Disturbance created during construction will leave the site and its immediate surroundings vulnerable to erosion and alien plant invasion for several years into the operational phase.	Local	None identified at this stage.
Habitat degradation due to erosion and alien plant invasion during decommissioning phase	Disturbance created during decommissioning will leave the site vulnerable to erosion and alien plant invasion for several years.	Local	None identified at this stage.
Direct faunal impacts due to decommissioning activities	Due to disturbance, noise and the operation of heavy machinery, faunal disturbance due to decommissioning will extend beyond the footprint and impact adjacent areas to some degree. This will however be transient and restricted to the period while machinery is operational. In the long term, decommissioning should restore the ecological functioning and at least some habitat value to the affected areas.	Local	None identified at this stage.

Description of expected significance of impact

Impacts on ecology will be of low to medium significance depending on the exact location of the development area/footprint. The project site provides sufficient area for the development of the project within areas which are not considered to be of significant ecological sensitivity. The following are areas recommended to be avoided by the development area:

- » Area of deeper sands with a higher abundance of *Vachellia erioloba* – south of the site.
- » Three larger ephemeral pans considered Very High sensitivity – north of the site.

Gaps in knowledge & recommendations for further study

- » Although previous collection records from the area exist, the study area itself may not have been previously surveyed and there may be additional species that have not yet been captured in the existing species databases for the area.
- » A detailed ecological survey and sensitivity assessment will be undertaken during the EIA phase.

7.3.2 Impacts on avifauna

Bird distribution patterns fluctuate widely in response to environmental conditions (e.g. local rainfall patterns, nomadism, migration patterns, seasonality), meaning that a composition noted at a particular moment in time will differ during another time period at the same locality. For this reason, a dry season and wet season bird monitoring survey are being conducted in line with Regime 2 for San Solar PV. The result from the dry and wet season bird monitoring will be used to inform both the development footprint as well as Avifauna Impact Assessment report, to be completed for the EIA Report.

The potential impacts to avifauna from construction and/or operation activities include:

- » Loss of habitat and displacement of birds
- » Loss of habitats for such species,
- » Disturbance during construction, and operation, including the potential for collision with infrastructure.

Most of the development area will be cleared of vegetation and habitat to accommodate the panel arrays and associated infrastructure. Clearing of vegetation will inevitably result in the loss of habitat and displacement of bird species. From the preliminary results it is evident that large-bodied species are more likely to become displaced as opposed to small passerine species. It is particularly regional endemics and conservation important species that are likely to become displaced. These include mainly passerine and smaller non-passerine species inhabiting the Kathu Bushveld and large terrestrial birds inhabiting the open Kathu Bushveld units.

To quantify the impact, it is necessary to calculate the number of birds (density) lost or displaced by the activity, including estimated density values of important species per unit area of habitat. The following bird species are most likely to be impacted by the loss of habitat due to their habitat requirements, fecundity and conservation status (although not limited to) due to the proposed development:

- » Black-chested Snake Eagle (*Circaetus pectoralis*);
- » Barred Wren-Warbler (*Calamonastes fasciolatus*);

- » Burchell's Sandgrouse (*Pterocles burchelli*);
- » Fawn-colored Lark (*Calendulauda africanoides*);
- » Kori Bustard (*Ardeotis kori*);
- » Layard's Warbler (*Curruca layardi*);
- » Pale Chanting Goshawk (*Melierax canorus*);
- » Red-billed Spurfowl (*Pternistis adspersus*);
- » Red-crested Korhaan (*Lophotis ruficrista*);
- » Northern Black Korhaan (*Afrotis afraoides*);
- » Tinkling Cisticola (*Cisticola rufilatus*);
- » Kalahari Scrub Robin (*Cercotrichas paena*);
- » Orange River Francolin (*Scleroptila gutturalis*).

» **Interaction with overhead power lines**

Birds are impacted in two ways by means of overhead power lines. It is however a common rule that large and heavy-bodied terrestrial bird species are more at risk of being affected in a negative way when interacting with powerlines in general. These include the following:

» **Electrocution**

Electrocution happens when a bird bridges the gap between the live components or a combination of a live and earth component of a power line, thereby creating a short circuit. This happens when a bird, mainly a species with a fairly large wingspan attempts to perch on a tower or attempts to fly-off a tower. Many of these species include vultures (of the genera *Gyps* and *Torgos*) as well as other large birds of prey such as the Martial Eagle (*Polemaetus bellicosus*) (Ledger & Annegarn, 1981; Kruger, 1999; Van Rooyen, 2000). These species will attempt to roost and even breed on the tower structures if available nesting platforms are a scarce commodity in the area. Other types of electrocutions happen by means of so-called "bird-streamers". This happens when a bird, especially when taking off, excretes and thereby causes a short-circuit through the fluidity excreta (Van Rooyen & Taylor, 1999). Large transmission lines (from 220 kV to 765 kV) are seldom a risk of electrocution, although smaller distribution lines (88 – 132kV) pose a higher risk.

» **Collision**

Collisions with earth wires have probably accounted for most bird-powerline interactions in South Africa. In general, the earth wires are much thinner in diameter when compared to the live components, and therefore less visible to approaching birds. Many of the species likely to be affected include heavy, large-bodied terrestrial species such as bustards, korhaans and a variety of waterbirds that are not very agile or manoeuvrable once airborne. These species, especially those with the habit of flying with outstretched necks (e.g. most species of storks) find it difficult to make a sudden change in direction while flying – resulting in the bird flying into the earth wires.

It is anticipated that part of the power line servitude will be cleared of vegetation. In addition, construction activities go hand in hand with high ambient noise levels. Although construction is considered temporary, many species will vacate the area during the construction phase and will become temporarily displaced.

Sensitivity Analysis of the Site

A preliminary sensitivity map was compiled, illustrating habitat units of higher sensitivity to birds (refer to **Figure 7.2**).

» **Areas of high sensitivity**

The open Kathu Bushveld and ephemeral pans are considered to be of high avifaunal sensitivity. The open Kathu Bushveld provides potential foraging habitat for large terrestrial bird species such as the Kori Bustard (*Ardeotis kori*). Construction activities in close proximity to these features could possibly displace these individuals from the area or increase the risk of collision.

The ephemeral pans provide ephemeral foraging opportunities for waterbirds and shorebird taxa, which are rare or absent in the area when these are dry. Many of these species are highly nomadic in the area and may become disorientated by the "lake effect" caused by the PV panels which may result in bird colliding with the panels (and also powerlines). The pans are also important from a functional and dynamic perspective at the landscape level since these form part of an "inter-connected" system or "stepping stones" of pans within the regional context, meaning that environmental conditions at these pans (e.g. water levels, salinity, food availability) are constantly changing depending on precipitation and evaporation. Therefore, none of the pans are exactly similar to each, thereby providing a continuous supply of resources for waterbirds when inundated.

The artificial livestock watering points often attract large numbers of granivore passerine and non-passerine bird species, of which many need to drink water on a daily basis. The placement of electrical infrastructure in close proximity to these areas could increase potential avian collisions with the infrastructure. These areas are therefore of artificial origin but could be relocated to other areas, or removed with a change in the land use.

» **Areas of medium sensitivity**

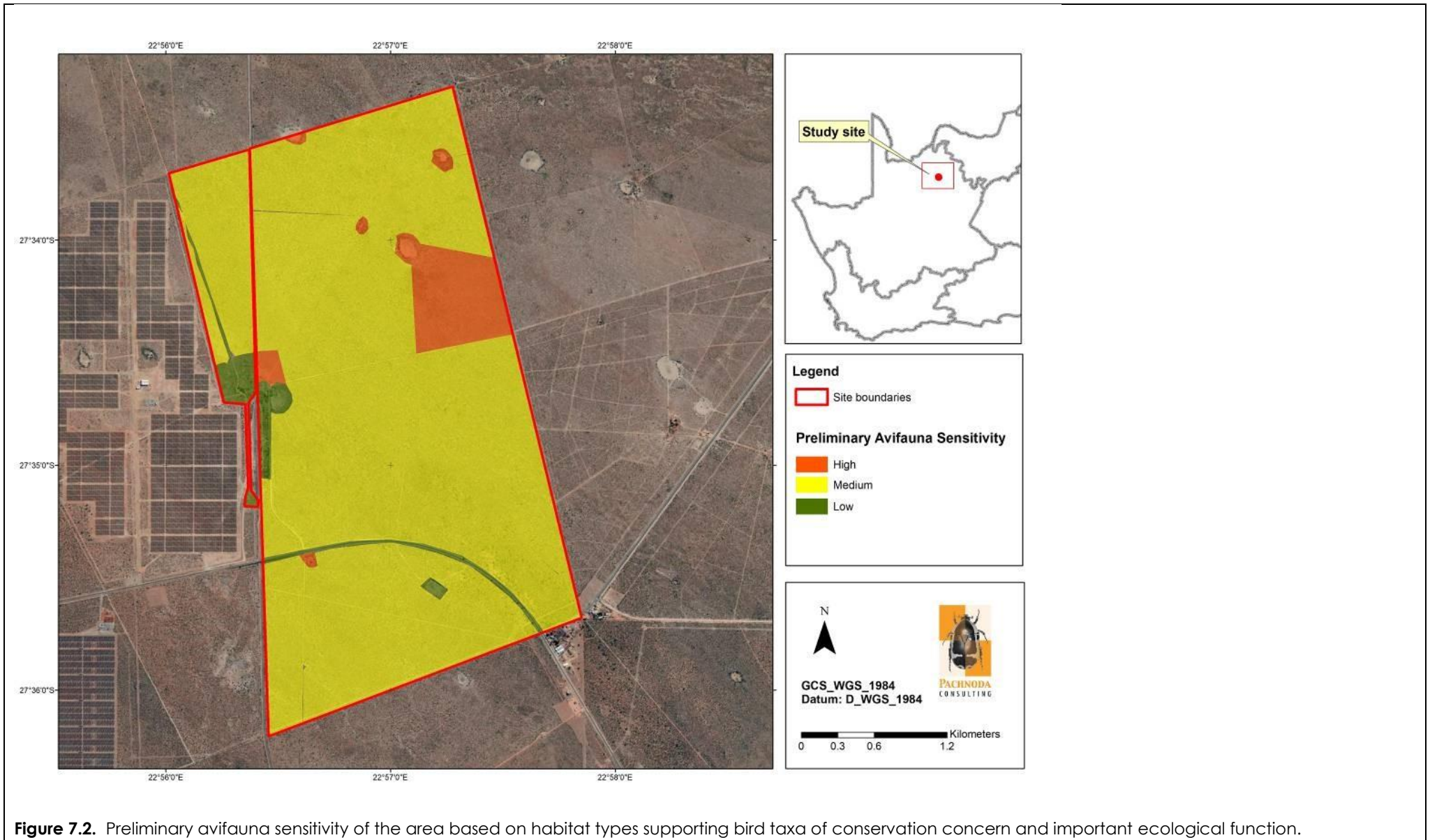
It includes the Kathu Bushveld (including Kathu Bushveld on deep red sands) which are prominent in the region and provides potential suitable foraging habitat for some collision-prone bird species, including the Northern Black Korhaan (*Afrotis afroides*) and Red-crested Korhaan (*Lophotis ruficrista*) with the potential to interact (e.g. collide) with electrical infrastructure. In addition, reporting rates for threatened and near threatened bird species are anticipated to be relatively low in this unit, thereby suggesting a medium sensitivity rating instead of a high sensitivity even though the majority of the habitat is natural. In addition, Kathu Bushveld is widespread in the region.

The Kathu Bushveld on deep red sands is expected to sustain a higher number of bird species when compared to the other units.

» **Areas of low sensitivity**

These habitat units are represented by transformed types and roads and quarries.

There is a probability that the conservation status of some of the aforementioned units or part thereof could have higher (or lower) sensitivity ratings. It is therefore expected that some of the units or part thereof could represent different sensitivity ratings to those displayed pending the outcome of a detailed survey.



Issue	Nature of Impact	Extent of Impact	No-Go Areas
Habitat destruction and disturbance and/or displacement of birds	Losses of natural habitat and displacement of birds through physical transformation, modifications, removals and land clearance. This impact is mainly restricted to the construction phase and is permanent.	Local	Ephemeral pans and Open Kathu bushveld.
Potential collision of birds with the PV panel structures	Avian collision impacts related to the PV facility during the operational phase (collision with the PV panels).	Regional	Ephemeral pans
Potential collision due to electrical distribution	Avian collision impacts related to the powerline reticulation and new distribution lines during operation.	Regional	Ephemeral pans
Description of expected significance of impact			
» The impact will be of a long duration (prior to mitigation) and is highly probable with a high significance but may be reduced to a medium or even low significance as per recommended mitigation measures (to be assessed during the EIA phase).			
Gaps in knowledge & recommendations for further study			
» A wet season survey is proposed to determine relative bird densities and distribution ranges and occurrence of collision prone bird species.			

7.3.3 Impacts on Soils, Geology, Agricultural Potential and Land-Use

The anticipated impacts of the proposed project on soil are soil compaction, erosion, soil pollution and the loss of soil fertility from the topsoil horizons to be stripped and stockpiled during the construction phase. The anticipated impact on agricultural potential is the loss of grazing areas where livestock can be produced.

The only impact on land use will be the change of land use from cattle farming to that of renewable energy generation.

Sensitivity Analysis of the Site

A preliminary sensitivity map was compiled taking into consideration the desktop data as well as the high potential agricultural areas for cultivation: Northern Cape Province, 2019 (DALRRD, 2019) (refer to **Figure 7.3**). This agricultural sensitivity map is preliminary in nature and will be revised during in the EIA phase as required.

The entire San Solar PV facility project site is considered to have Low agricultural sensitivity to the proposed development based on the available data. This is further confirmed by the absence of any High Potential Agricultural Areas (HPAAs) in the vicinity of the project site. The nearest HPAAs are 170km away in a south-eastern and south-western direction. These HPAAs are associated with irrigation schemes and the availability of water that can be used for irrigation.

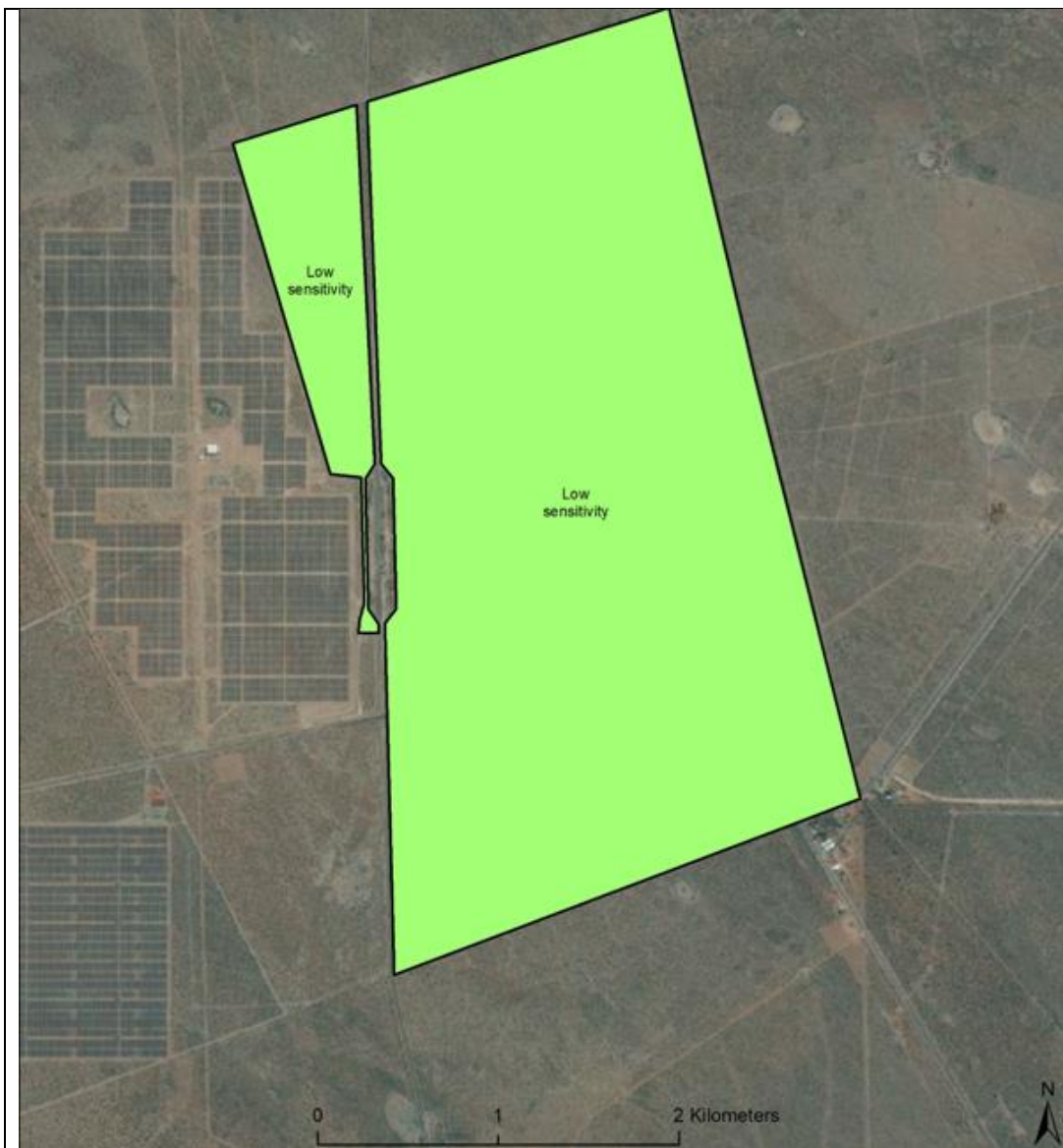


Figure 7.3. Preliminary agricultural sensitivity of the San Solar PV facility project area

Impacts	Nature of Impact	Extent of Impact	No-Go Areas
Loss of areas of grazing areas where livestock can be produced	Areas where the PV modules and other infrastructure will be constructed, will no longer be available for livestock production.	Local	None identified at this stage
Soil compaction	Soil compaction will occur wherever construction vehicles and equipment will traverse the site and where the PV modules and other long-term infrastructure will be erected.	Local	None identified at this stage
Soil erosion	Wherever construction activities will result in bare soil surfaces, these surfaces prone to loss of soil particles as a result of wind and water movement	Local	None identified at this stage
Loss of soil fertility through disturbance of in situ horizon organisation	In any area where topsoil will be stripped for construction purposes, the soil horizons will be mixed and the mixture may have lower soil fertility than before it was stripped.	Local	None identified at this stage
Soil chemical pollution	Oil and fuel spillages as well as waste generation during the project cycle will result in soil chemical pollution.	Local	None identified at this stage
Change in land use	The proposed project will change the current land use from agriculture to energy generation	Local	None identified at this stage
<p>Description of expected significance of impact</p> <ul style="list-style-type: none"> » Impacts will be of low to medium & medium to high significance. Once construction is finalised, areas that are affected by compaction outside of the development footprint, must be rehabilitated. » The project may have a moderate to major positive impact on the current land use and in the worst case, have a neutral impact 			
<p>Gaps in knowledge & recommendations for further study</p> <ul style="list-style-type: none"> » The final layout of the infrastructure, including the exact footprint especially the need for additional access roads, will determine the size of the areas to be lost. Once the final layout is available, the impacts can be assessed in detail. » Soil texture and soil organic carbon analysis results of the EIA phase will be used to calculate the erodibility of soils within the project site. » The final results of the EIA phase soil classification survey will be used to develop guidelines for topsoil stripping and stockpile management during the construction phase. » The economic viability of livestock farming within the project site, will be calculated during the detail study phase. 			

7.3.4 Impacts on Heritage (Archaeology, Palaeontology and Cultural Landscape)

The San Solar PV facility is planned to be located within an area previously authorised for a 75MW PV project, also known as the San Solar PV project (DEA ref no: 14/12/16/3/3/2/273, EA issued on 02 July 2013), which Environmental Authorisation lapsed in 2021. As part of this full EIA, SAHRA issued final comments/ case decision relating to the project on 26 February 2013 (CaseID: 349) as follows:

As there is apparently no evidence of any significant archaeological material in this area, the SAHRA Archaeology, Palaeontology and Meteorites Unit has no objection to the development (in terms of the archaeological component of the heritage resources) on condition that, if any new evidence of archaeological sites or artefacts, palaeontological fossils, graves or other heritage resources are found during development, construction or mining, SAHRA and an archaeologist and/or palaeontologist, depending on the nature of the finds, must be alerted immediately.

» Heritage and archaeological resources

Based on the information included in Gaigher (2013) and several Archaeological assessments conducted in the immediate area, there is no evidence of any significant archaeological material and as such it is not anticipated that the development of a solar PV facility on this site will have a negative impact on significant archaeological heritage. As the site has been previously surveyed and the findings presented to SAHRA, it has been recommended that further archaeological studies will not be necessary during the EIA phase.

» Palaeontology

Based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the limestone and calcretes of the Tertiary Formation there are no visible outcrops in the flat landscape, and such fossils are extremely rare. As the site has been previously surveyed and the findings presented to SAHRA, it has been recommended that further paleontological studies will not be necessary during the EIA phase.

» Cultural landscape

The area proposed for the San Solar PV Facility is located immediately adjacent to two existing/operational PV facilities to the west. As such, it is not anticipated that the proposed development will have a negative impact on any significant cultural landscape in the area due to the existing similar infrastructure in place which forms part of the cultural landscape. Furthermore, it is often preferred to have development such as PV facilities clustered in one area to mitigate the sprawl of this infrastructure across otherwise pristine landscapes.

Sensitivity Analysis of the Site

The Palaeosensitivity was identified as high in terms of the SAHRIS Palaeontological Sensitivity Map (refer to **Figure 7.4**), however, the geological structures suggest that the rocks are unlikely to contain fossils. The potential impact to fossil heritage resources is likely to be of a low significance. As such, the proposed development is unlikely to negatively impact significant palaeontological heritage resources. Findings from the previous archaeology survey for the site indicate that the archaeological resources are likely to be of a low significance.

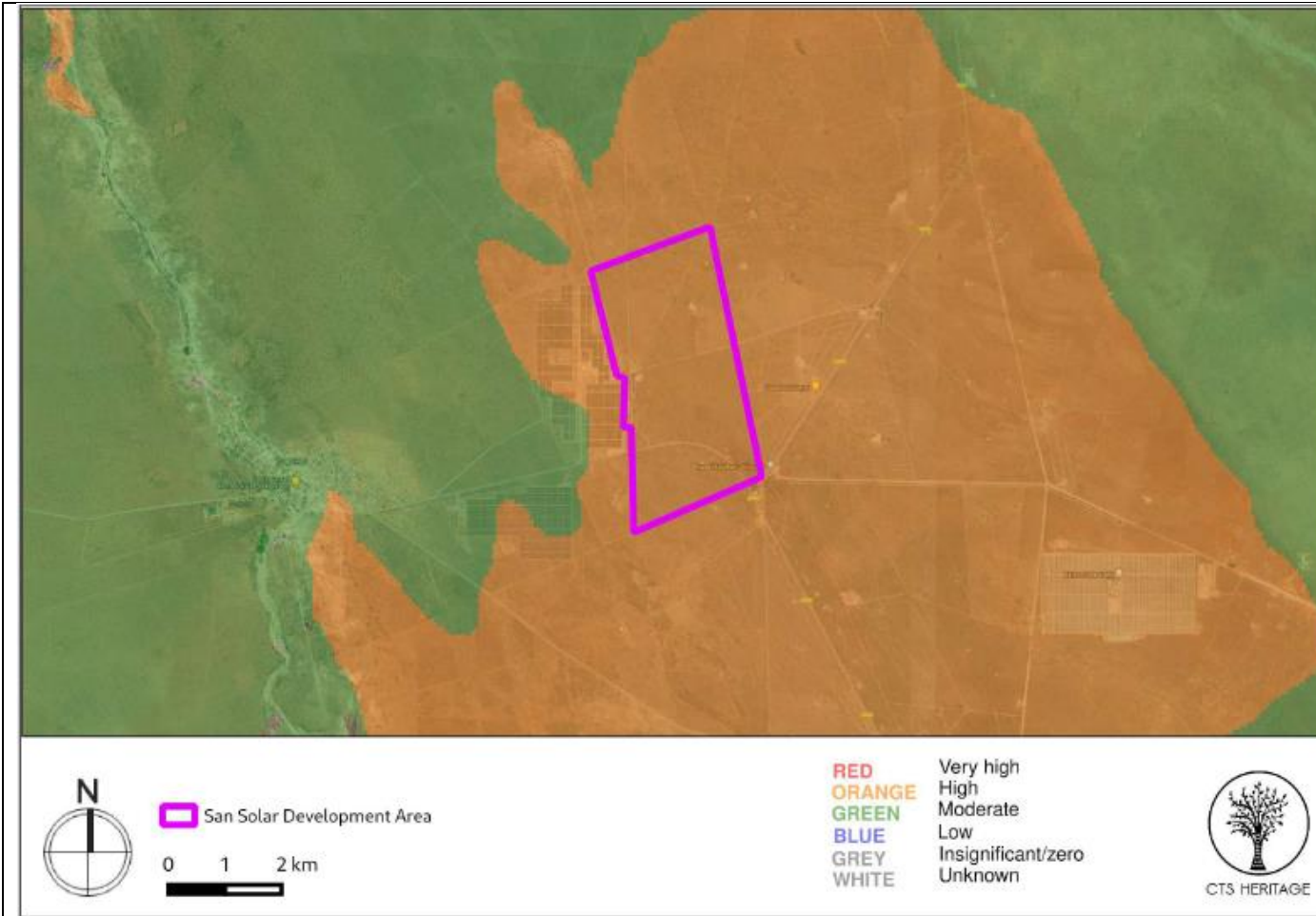


Figure 7.4: Palaeosensitivity map indicating high fossil sensitivity underlying the project site

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Destruction of significant heritage resources	Impact to significant heritage resources through destruction during the development phase and disturbance during the operational phase.	Local	None identified at this stage
Description of expected significance of impact			

» Local scale with broader impacts to scientific knowledge

Gaps in knowledge & recommendations for further study

- » It is unlikely that the proposed development will impact significant cultural landscape, archaeological or palaeontological heritage and as such, the assessment of archaeology and palaeontology will not be necessary during the EIA phase.
- » Should the excavations associated with the development impact significant archaeological heritage located below the ground surface, the chance fossil finds procedure should be implemented for the duration of excavation activities.

7.3.5 Visual Impacts

The anticipated issues related to the potential visual impact include the following:

- » The visibility of the facility to, and potential visual impact on, observers travelling along the R380 main road.
- » The visibility of the facility to, and potential visual impact on residents of dwellings within the study area, with specific reference to the farm residences in closer proximity to the development.
- » The potential visual impact of the facility on the visual character or sense of place of the region.
- » The potential visual impact of the facility on tourist routes or tourist destinations/facilities (if present).
- » The potential visual impact of the construction of ancillary infrastructure (i.e. internal access roads, buildings, etc.) on observers in close proximity to the facility.
- » The visual absorption capacity of the natural vegetation (if applicable).
- » Potential cumulative visual impacts (or consolidation of visual impacts), with specific reference to the placement of the PV facility within close proximity of two operational PV facilities.
- » The potential visual impact of operational, safety and security lighting of the facility at night on observers residing in close proximity of the facility.
- » Potential visual impact of solar glint and glare as a visual distraction and possible air/road travel hazard.
- » Potential visual impacts associated with the construction phase.
- » The potential to mitigate visual impacts and inform the design process.

It is envisaged that the issues listed above may potentially constitute a visual impact at a local and/or regional scale. These need to be assessed in greater detail during the EIA phase of the project.

Sensitivity Analysis of the Site

The result of the viewshed analysis for the proposed facility is shown on the map below. The viewshed analysis was undertaken from a representative number of vantage points within the development footprint at an offset of 4m above ground level (refer to **Figure 7.5**). This was done in order to determine the general visual exposure (visibility) of the area under investigation, simulating the maximum height of the proposed structures (PV panels and inverters and BESS) associated with the facility.

The viewshed analysis will be further refined once a preliminary and/or final layout is completed and will be regenerated for the actual position of the infrastructure on the site and actual proposed infrastructure during the EIA phase of the project. **Figure 7.5** also indicates proximity radii from the development footprint in order to show the viewing distance (scale of observation) of the facility in relation to its surrounds.

The development may be highly visible within a 1km radius of the site. The Stokkiesdraai guesthouse is located within this zone, as well as sections of the R380 main road.

1– 3km radius, contains the Haakbosskerm homestead and restaurant, the Limebank, Flatlands and Halliford homesteads, and sections of the R380 main road. Other than these potential receptor sites, the rest of the visually exposed areas fall within vacant farmland or natural open space. It is expected that the PV facility would be clearly visible from these homesteads.

This zone contains the Haakbosskerm homestead and restaurant, the Limebank, Flatlands and Halliford homesteads, and sections of the R380 main road. Other than these potential receptor sites, the rest of the visually exposed areas fall within vacant farmland or natural open space. It is expected that the PV facility would be clearly visible from these homesteads.

Within a 3 – 6km radius, the visual exposure is more scattered and interrupted due to the undulating nature of the topography. Most of this zone falls within vacant open space and agricultural land but does include some farm dwellings and residences. Some of these include Curtis, Klein Landbank, Selsden and the eastern outlying parts of Dibeng. It is expected that the PV facility may be visible from these homesteads.

At distances exceeding 6km the intensity of visual exposure is expected to be very low and highly unlikely due to the distance between the object (development) and the observer. This zone contains a single potentially exposed receptor site, namely the Bosaar homestead.

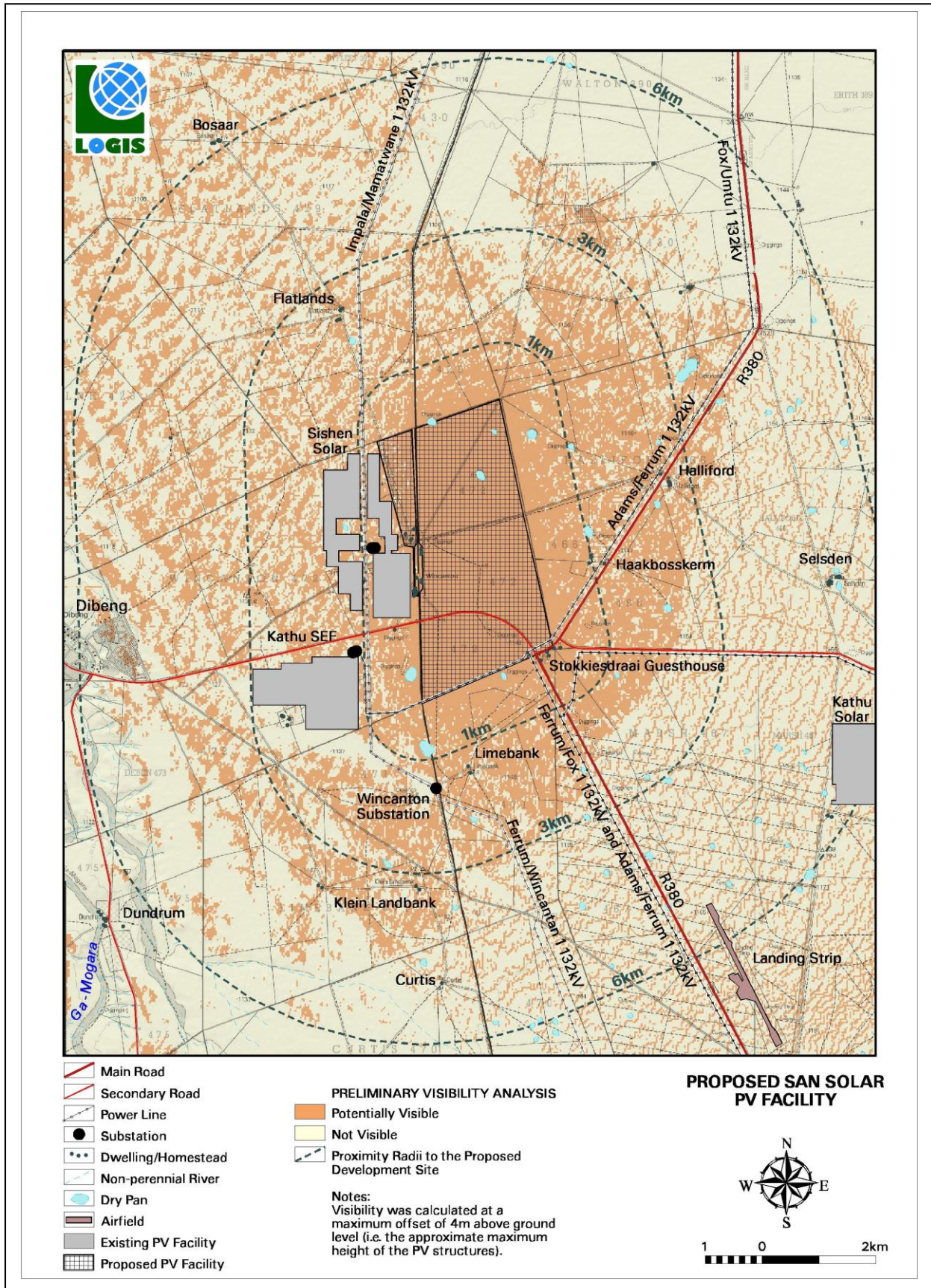


Figure 7.5: Preliminary visual exposure of the San Solar PV facility

Issues	Nature of Impact	Extent of Impact	No-Go Areas
The viewing of the PV facility infrastructure and activities	The potential negative experience of viewing the infrastructure and activities within a predominantly undeveloped setting	Local - Primarily observers situated within a 3km radius of the facility	None identified at this stage
Description of expected significance of impact			
» Due to the nature and location of the facility, there is likely to be a long-term influence on surrounding landscape character as experienced by the receptors. The impact significance is therefore anticipated to be moderate to high. The significance of this impact will be confirmed during the EIA Phase.			
Gaps in knowledge & recommendations for further study			
A finalised layout of the PV plant and ancillary infrastructure are required for further analysis. This includes the provision of the dimensions of the proposed structures and ancillary equipment. Additional spatial analyses are required in order to create a visual impact index that will include the following criteria:			
<ul style="list-style-type: none"> » Visual exposure » Visual distance/observer proximity to the structures/activities » Viewer incidence/viewer perception (sensitive visual receptors) » Visual absorption capacity of the environment surrounding the infrastructure and activities 			
Additional activities:			
<ul style="list-style-type: none"> » Identify potential cumulative visual impacts » Undertake a site visit » Recommend mitigation measures and/or infrastructure placement alternatives 			

7.3.6 Social Impacts

Construction Phase

<p>The majority of social impacts associated with the project are anticipated to occur during the construction phase of the development and are typical of the type of social impacts generally associated with construction activities. These impacts will be temporary and short-term (~12 months) but could have long-term effects on the surrounding social environment if not planned or managed appropriately. It is therefore necessary that the detailed design phase be conducted in such a manner so as not to result in permanent social impacts associated with the ill-placement of project components or associated infrastructure or result in the mis-management of the construction phase activities.</p>
<p>The positive and negative social impacts identified and assessed for the construction phase includes:</p>
<ul style="list-style-type: none"> » Direct and indirect employment opportunities » Economic multiplier effects

<ul style="list-style-type: none"> » Influx of jobseekers and change in population » Safety and security impacts » Impacts on daily living and movement patterns » Nuisance impacts, including noise and dust » Visual impacts and sense of place impacts 			
Impacts	Nature of Impact	Extent of Impact	No-Go Areas
Construction of the project will result in the creation of a number of direct and indirect employment opportunities, which will assist in addressing unemployment levels within the area and aid in skills development of communities in the area.	Positive – the creation of employment opportunities will assist to an extent in alleviating unemployment levels within the area.	The impact will occur at a local, regional and national level.	None identified at this stage
<p>Description of expected significance of impact</p> <p>At its peak, the construction is likely to result in the creation of approximately 300 – 400 employment opportunities. Of those employment opportunities available, approximately 60% will comprise opportunities for low skilled workers, 25% for semi-skilled workers, and 15% for skilled workers. Skills developed through experience in the construction of the facility will be retained by the community members involved. The impact is likely to be positive, local to national in extent, short-term, and of medium significance</p>			
<p>Gaps in knowledge & recommendations for further study</p> <p>Gaps in Knowledge</p> <ul style="list-style-type: none"> » Collection on exact direct and indirect employment opportunities and skills development opportunities. » Collection of information on local hospitality and services sector <p>Recommendation</p> <ul style="list-style-type: none"> » Site visits and interviews with representatives from local municipality, and the hospitality and services sector. » Site visit and interviews with local chamber of commerce 			

Impacts	Nature of Impact	Extent of Impact	No-Go Areas
Economic multiplier effects from the use of local good and services during the construction phase.	Positive – There are likely to be opportunities for local businesses to provide goods and services during the construction phase of development.	The impact will occur at a local and regional .	None identified at this stage
<p>Description of expected significance of impact</p> <p>Economic multiplier effects from the use of local goods and services opportunities include but are not limited to, the provision of construction materials and equipment, and workforce essentials such as services, safety equipment, ablution, accommodation, transportation and other goods. The increase in demand for goods and services may stimulate local business and local economic development (however locally sourced materials and services may be limited due to availability). There is likely to be a direct increase in industry and indirect increase in secondary businesses. The impact is likely to be positive, local to regional in extent, short-term, and of medium significance.</p>			
<p>Gaps in knowledge & recommendations for further study</p>			

<p><u>Gaps in Knowledge</u></p> <ul style="list-style-type: none"> » Collection on exact direct and indirect employment opportunities and skills development opportunities. » Collection of information on local hospitality and services sector <p><u>Recommendation</u></p> <ul style="list-style-type: none"> » Site visits and interviews with representatives from local municipality, and the hospitality and services sector. » Site visit and interviews with local chamber of commerce

Issues	Nature of Impact	Extent of Impact	No-Go Areas
Issue Increased pressure on infrastructure and basic services, and social conflicts during construction as a result of in-migration of people.	Negative – The in-migration of job seekers to the area could result in increased pressure being placed on infrastructure and basic services, and a rise in social conflicts.	The impact will occur at a local level..	None identified at this stage

Description of expected significance of impact

An influx of people looking for employment or other economic opportunities could result in increased pressure being placed on economic and social infrastructure, and a change in the local population. Population change refers to the size, structure, density as well as demographic profile of the local community.

An influx of jobseekers into an area, could lead to a temporary increase in the level of crime, cause social disruption and put pressure on basic services. It could also potentially create conflict between locals and outsiders due to potential differences in racial, cultural and ethnic composition. A further negative impact that could result due to an influx of jobseekers into an area is an increase in unemployment levels due to an oversupply of available workforce, particularly with respect to semi- and unskilled workers.

<p>Gaps in knowledge & recommendations for further study</p> <p><u>Gaps in Knowledge</u></p> <ul style="list-style-type: none"> » Collection of information on existing community challenges and needs <p><u>Recommendation</u></p> <ul style="list-style-type: none"> » Site visit and interviews with representatives from local municipality and community representative

Issues	Nature of Impact	Extent of Impact	No-Go Areas
Temporary increase in safety and security concerns associated with the influx of people during the construction phase.	Negative – The in-migration of job seekers to the area could be perceived to result in increased criminal activity.	The impact will occur at a local level.	None identified at this stage

Description of expected significance of impact

The commencement of construction activities can be associated with an increase in crime within an area. The perceived loss of security during the construction phase of a project due to an influx of workers and / or outsiders to the area (as in-migration of newcomers, construction workers or jobseekers are usually associated with an increase in

crime), may have indirect effects such as increased safety and security concerns for neighbouring properties, damage to property, increased risk of veld fire, stock theft, poaching, crime and so forth.

The labour force will not permanently reside within the construction site.

Gaps in knowledge & recommendations for further study

Gaps in Knowledge

- » Information on existing crime levels within the area
- » Mechanisms for employment of local labour and minimisation of in-migration

Recommendation

- » Site visit and interviews with local farmers and representatives from local farming associations.

Issues	Nature of Impact	Extent of Impact	No-Go Areas
Temporary increase in traffic disruptions and movement patterns during construction	Negative – An increase in traffic due to construction vehicles and heavy vehicles could create short-term disruptions and safety hazards for current road users.	The impact will occur at a local level.	None identified at this stage

Description of expected significance of impact

Increased traffic due to construction vehicles and heavy vehicles could cause disruptions to road users and increase safety hazards. The use of local roads and transport systems may cause road deterioration and congestion. The impact is likely to be negative, local in extent, short-term, and of low significance given the proximity of the project to existing mining operations within the area

Gaps in knowledge & recommendations for further study

Gaps in Knowledge

- » Number of vehicle trips anticipated during construction.

Recommendation

- » Site visit and interviews with local farmers and representatives from local farming associations etc.

Issues	Nature of Impact	Extent of Impact	No-Go Areas
Nuisance impacts in terms of temporary increase in noise and dust, and wear and tear on access roads to the site.	Negative – The impact will negatively impact sensitive receptors and could cause disruptions for neighbouring properties.	The impact will occur at a local level.	None identified at this stage

Description of expected significance of impact

Nuisance impacts associated with construction related activities include noise, dust, and possible disruption to adjacent properties. Site clearing activities increase the risk of dust and noise being generated, which can in turn negatively impact on adjacent properties. The movement of heavy construction vehicles and construction activities and equipment also have the potential to create noise, as well as impacts on travellers travelling along the R505 national road, and gravel access roads. The primary sources of noise during construction would be from construction equipment, vehicle and truck traffic. Noise levels can be audible over a large distance although are generally short in duration. Dust would be generated from construction activities as well as trucks / vehicles driving on gravel access roads. This impact will negatively impact sensitive receptors. The impact of noise and dust on sensitive receptors can be reduced through the application of appropriate mitigation measures.

<p>Gaps in knowledge & recommendations for further study</p> <p><u>Gaps in Knowledge</u></p> <ul style="list-style-type: none"> » Impact of noise and dust on surrounding landowners. <p><u>Recommendation</u></p> <ul style="list-style-type: none"> » Site visit and interviews with local farmers and representatives from local farming associations etc.
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Issues	Nature of Impact	Extent of Impact	No-Go Areas
Intrusion impacts from construction activities will have an impact on the area's "sense of place".	Negative – The project could alter the area's sense of place which could negatively impact on sensitive receptors.	The impact will occur at a local level.	None identified at this stage
<p>Description of expected significance of impact</p> <p>Intrusion impacts such as aesthetic pollution (i.e. building materials, construction vehicles, etc.), noise and light pollution will impact the "sense of place" for the local community. Construction related activities have the potential to negatively impact a local area's "sense of place". Such an impact is likely to be present during the construction phase. It is however expected that the power line will only affect areas and receptors that have already been exposed to other existing grid connection infrastructure (i.e. power lines and substations) and other industrial infrastructure, specifically mining related infrastructure (i.e. for which the sense of place has already been altered).</p>			
<p>Gaps in knowledge & recommendations for further study</p> <p><u>Gaps in Knowledge</u></p> <ul style="list-style-type: none"> » Collection of information on location of existing farming and hospitality operations and activities <p><u>Recommendation</u></p> <ul style="list-style-type: none"> » Site visit and interviews with local farmers and representatives from local municipality and farming and hospitality association etc. 			

Operations Phase

<p>It is anticipated that the San Solar PV facility will operate for approximately 20 years, which is equivalent to the operation lifespan of the project.</p> <p>The potential positive and negative social impacts that could arise as a result of the operation of the project include the following:</p> <ul style="list-style-type: none"> » Direct and indirect employment opportunities » Visual impact and sense of place impacts » Impacts associated with the loss of agricultural land 			
Issues	Nature of Impact	Extent of Impact	No-Go Areas
Creation of direct and indirect employment and skills development opportunities and skills development as a result of the operation of the project.	Positive – The creation of employment opportunities and skills development will assist to an extent in alleviating unemployment levels within the area.	The impact will occur at a local, regional and national level.	None identified at this stage

<p>Description of expected significance of impact</p> <p>During operation a number of direct full time employment opportunities will be created. Of those employment opportunities created approximately 70% will comprise opportunities for low-skilled workers, 25% will comprise opportunities for semi-skilled workers, and approximately 5% will comprise opportunities for skilled workers. Employment opportunities include safety and security staff, operation and monitoring, and maintenance crew. Maintenance activities will be carried out throughout the lifespan of the project, and will include washing of solar panels, vegetation control, and general maintenance around the solar energy facility. The impact is likely to be positive, local to national in extent, long-term, and of medium significance.</p>
<p>Gaps in knowledge & recommendations for further study</p> <p>Gaps in Knowledge</p> <ul style="list-style-type: none"> » Information on the exact direct and indirect employment opportunities and skills development opportunities likely to be created during construction <p>Recommendation</p> <ul style="list-style-type: none"> » Restrict the recruitment of the workforce and suppliers of materials, equipment and services entirely to local area.

Issues	Nature of Impact	Extent of Impact	No-Go Areas
Sense of place impacts from a social perspective associated with the operation phase of the solar energy facility and associated infrastructure.	Negative – The project could alter the areas sense of place which could negatively impact on sensitive receptors	The impact will occur at a local level.	None identified at this stage
<p>Description of expected significance of impact</p> <p>An area's sense of place is created through the interaction of various characteristics of the environment, including atmosphere, visual resources, aesthetics, climate, lifestyle, culture, and heritage. An area's sense of place is however subjective and largely dependent on the demographics of the population residing within the area and their perceptions regarding trade-offs. For example, while some individuals may prefer not to see any form of infrastructure development, others may be interested in large-scale infrastructure, or engineering projects and consider the impact to be less significant. Such a scenario may be true given that one of the main economic sectors within the area is mining which has altered the landscape from natural to industrial.</p>			
<p>Gaps in knowledge & recommendations for further study</p> <p>Gaps in Knowledge</p> <ul style="list-style-type: none"> » Potential sensitive visual receptors need to be identified. » Visual Impact Assessment to inform impact on sense of place. <p>Recommendation</p> <ul style="list-style-type: none"> » Site visit and interviews with local farmers and representatives from local municipality and farming and hospitality associations etc. 			

7.4 Evaluation of Potential Cumulative Impacts Associated with the project

Impacts of a cumulative nature place the direct and indirect impacts of the proposed project into a regional and national context, particularly in view of similar or resultant developments and activities in the region. Potential cumulative impacts associated with San Solar PV are described below, and will be assessed in detail as part of the subsequent EIA phase to be conducted for the project.

Impact

Cumulative impacts, in relation to an activity, refer to the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area. For cumulative effects analysis to help the decision-maker and inform interested parties, it must be limited to effects that can be evaluated meaningfully (DEAT, 2004). It is important to explore the potential for cumulative impacts as this will lead to a better understanding of these impacts and the potential for mitigation that may be required. The scale at which the cumulative impacts are assessed is important. For example, the significance of the cumulative impact on the regional or national economy will be influenced by solar PV facility developments throughout South Africa, while the significance of the cumulative impact on the visual amenity may only be influenced by solar PV facility developments that are in closer proximity to each other. For practical purposes a sub-regional scale of 30km is considered for the evaluation of cumulative impact of PV facilities.

The cumulative impacts associated with San Solar PV have been viewed from two perspectives within this Scoping Report:

- » Cumulative impacts associated with the scale of the project (one 100MW PV Facility on the project site); and
- » Cumulative impacts associated with other relevant planned, approved or existing solar developments within a 30km radius of the project site (multiple PV facilities in the proximity of the site).

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

- » Additive (incremental);
- » Interactive.
- » Sequential; or
- » Synergistic.

Canter and Sadler (1997) describe the following process for addressing cumulative effects in an EIA:

- » Delineating potential sources of cumulative change (i.e. GIS to map the relevant renewable energy facilities in close proximity to one another);
- » Identifying the pathways of possible change (direct impacts);
- » Indirect, non-linear or synergistic processes; and
- » Classification of resultant cumulative changes.

The site for the proposed development (Remaining extent of the Farm Wincanton 472) is located within 30km of several other authorised solar facilities. These projects are clustered in a node (refer to **Figure 7.5**), and include the following:

Project Name	Project Status	Location relative to San Solar PV
Kathu Solar PV	Operational	Directly west of the San Solar site
Sishen Solar PV	Operational	Directly adjacent farm west of the San Solar site
Kathu Solar CSP	Operational	6km east of the San Solar site
Boitshoko Solar PV	Authorised	Directly adjacent farm south west of the San Solar site
AEP Kathu Solar	Authorised	6km south east of the San Solar site
Mogara Solar PV	Authorised	6km south east of the San Solar site
Bestwood Solar PV	Authorised	5km south east of the San Solar site
Hyperion Solar PV	Authorised	5km north east of the San Solar site
Shirley Solar Park	Authorised	7km north of the San Solar site
AEP Legoko Solar PV	Authorised	7km south east of the San Solar site
AEP Mogobe Solar PV	Authorised	8km south east of the San Solar site

The cumulative impacts that have the potential to be compounded through the development of the solar PV facility and its associated infrastructure in proximity to other similar developments include impacts such as those listed below. The role of the cumulative assessment is to test if such impacts are relevant to San Solar PV within the development area being considered for the development:

- » Unacceptable loss of threatened or protected vegetation types, habitat or species through clearing, resulting in an impact on the conservation status of such flora, fauna or ecological functioning.
- » Unacceptable risk to freshwater features through disturbance associated with construction activities and increased runoff and erosion during the operation phase.
- » Unacceptable risk to avifauna through habitat loss, displacement and collision with PV panels.
- » Unacceptable loss of high agricultural potential areas presenting a risk to food security and increased soil erosion.
- » Unacceptable loss of heritage resources (including palaeontological and archaeological resources);
- » Complete or whole-scale change in the sense of place and character of an area and unacceptable visual intrusion; and
- » Unacceptable impact to socio-economic factors and components.

Summary of the nature, significance, consequence, extent, duration and probability of the impacts

- » The above-mentioned impacts are considered to be probable, although it is anticipated that the extent, duration, and magnitude of these impacts can be minimised to levels where this impact can be regarded as having low significance through the implementation of appropriate mitigation measures.
- » The operational lifespan of the project and other solar energy facilities within the surrounding areas is expected to be long-term (i.e. a minimum of 20 years) and subsequently the impact is also expected to be long-term.

» The impact associated with the proposed development is expected to be local, affecting mainly the immediate environment and surrounding areas, as well as other renewable energy facilities within the vicinity.

Gaps in knowledge & recommendations for further study:

- » Each specialist study will consider and assess the cumulative impacts of proposed, approved and authorised renewable projects in the area.
- » Cumulative impacts will be fully assessed and considered in the EIA phase.

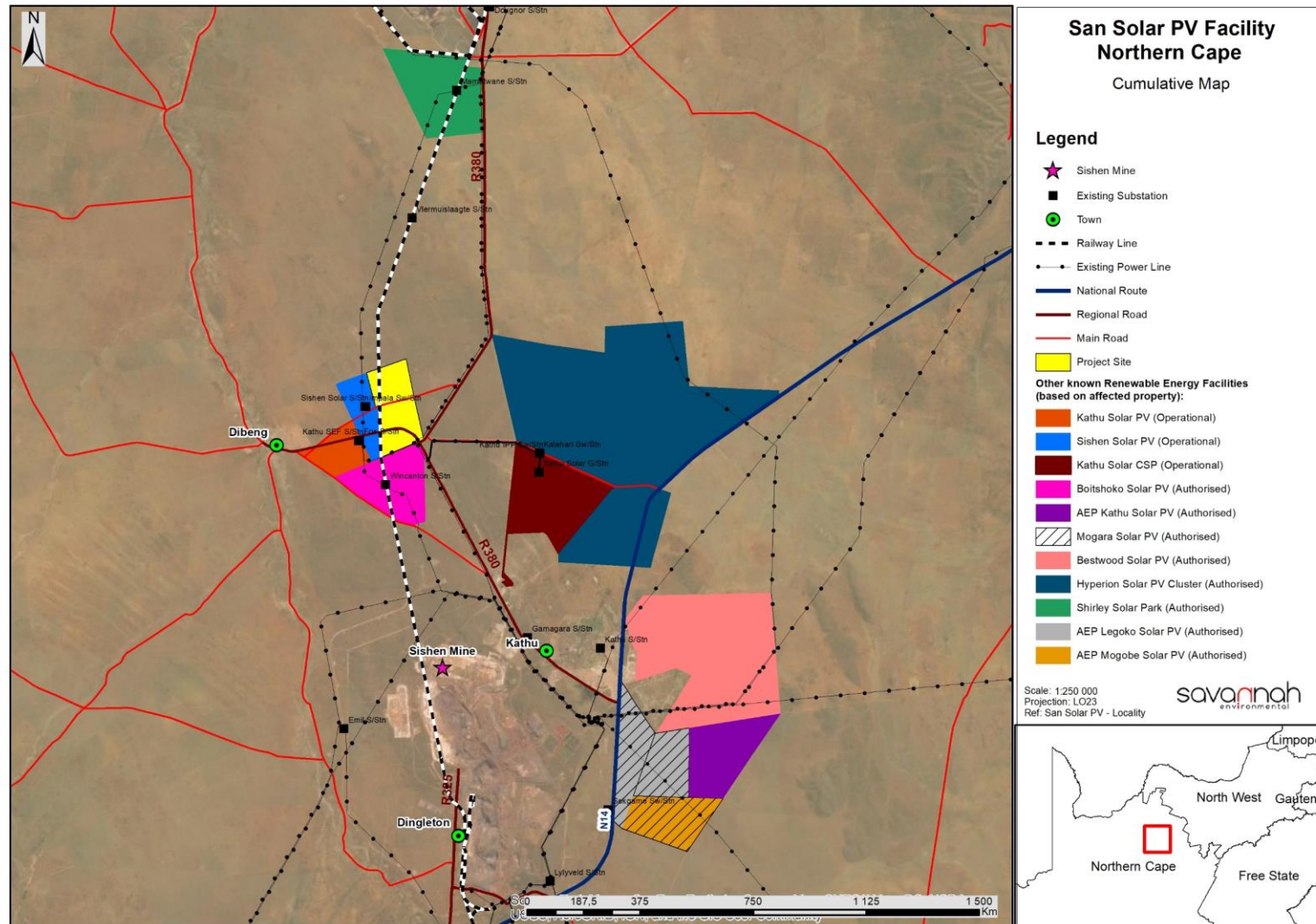


Figure 7.5: Cumulative map illustrating other authorised and/or constructed solar facilities located within the vicinity of the San Solar PV project site (Appendix J).

CHAPTER 8: CONCLUSION

This Scoping Report is aimed at detailing the nature and extent of the proposed development, identifying and describing potential issues associated with developing the San Solar PV facility and associated infrastructure, identifying potential environmental fatal flaws and/or areas of sensitivity, and defining the extent of studies required to be undertaken as part of the detailed EIA phase. This was achieved through an evaluation of the proposed project, involving the project proponent, and specialist consultants. This Scoping Report has been compiled in terms of the 2014 EIA Regulations (GNR 326) published in terms of Section 24(5) of NEMA.

A summary of the conclusions of the evaluation of the potential impacts identified to be associated with the project is provided in **Section 8.2**. Recommendations regarding investigations required to be undertaken within the detailed EIA phase are provided within the Plan of Study for EIA (**Chapter 9**).

8.1 Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of an Impact Assessment Report

This chapter of the scoping report includes the following information required in terms of Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
(g)(xi) a concluding statement indicating the preferred alternatives, including the preferred location of the activity.	An overall concluding statement which refers to the preferred location of the development area for the San Solar PV facility is included within Section 8.4 .

8.2 Conclusions drawn from the Evaluation of the PV Facility Development

The San Solar PV Facility is proposed on the Remaining extent of the Farm Wincanton 472, which is located approximately 16km north-west of Kathu in the Northern Cape Province. PV technology is proposed to be utilised for the generation of electricity, with a capacity of up to 100MW, with the grid connection via a LILO connection to the Fox-Umtu 132kV grid line (infrastructure considered within a 500m wide corridor).

The infrastructure associated with the solar PV facility, including all associated infrastructure will include:

- » PV modules and mounting structures
- » Inverters and transformers
- » Cabling between the panels, to be laid underground where practical.
- » Battery Energy Storage System (BESS)
- » Site and internal access roads (up to 8m wide)
- » Laydown area.
- » Operation and Maintenance buildings including a gate and security building, control centre, offices, warehouse, and workshop areas for maintenance and storage.
- » Grid connection solution including a 132kV facility substation, 132kV switching station to be connected via a Loop-in-Loop out (LILO) connection to the Fox-Umtu 132kV overhead power line located south east of the site.

The Scoping study included the identification of potential impacts associated with the project through specialist inputs and consultation with affected parties and key stakeholders. A preliminary evaluation of

the extent and significance of potential impacts associated with the development of San Solar PV have been detailed in Chapter 7. These will be assessed in detail through the EIA Phase assessment, which will include independent specialist assessments.

This scoping study has identified minimal areas of higher sensitivity within the development area to assist in focussing the location of the development footprint for San Solar PV to minimise the potential for environmental impact. The extent of the project site is approximately 991.5ha and has been considered in this Scoping report. A development area approximately 400ha in extent will be demarcated within this area, and will allow an adequate footprint for the installation of a solar PV facility with a contracted capacity of up to 100MW_{AC}, while also allowing for the avoidance of environmental site sensitivities of high significance (that is, Avoidance as step 1 in the mitigation hierarchy). The size of the development footprint²² within the development area will be confirmed in the EIA phase once the facility layout is available for assessment.

The majority of potential impacts identified to be associated with the construction of San Solar PV and associated infrastructure are anticipated to be localised and restricted to the development area itself and the grid connection corridor, while operation phase impacts/benefits range from local to regional. No environmental fatal flaws were identified to be associated with the development area. Areas or features of high sensitivity were identified to be avoided by the development area/footprint. These areas of high sensitivity include the ephemeral pans that are present within the northern portion of the site, the area of deeper sands in the south of the site, as well as the identified habitat features that are considered to be 'key ecosystem providers' for avifauna.

The potentially significant issues related to the **construction** of the San Solar PV facility include:

- » Biodiversity and habitat loss and impacts on flora, fauna and avifauna resulting from activities such as disturbance and site clearance for installation of the facility components and associated infrastructure.
- » Soil erosion, loss or degradation due to site clearance and compaction for installation of the facility components and associated infrastructure and due to the construction on internal access roads.
- » Visual impacts on the landscape.
- » Social impacts, both positive and negative (job creation and business opportunities, impacts associated with construction workers in the area).

The potentially significant issues related to the **operation** of the San Solar PV facility include:

- » Change in land use from agriculture to energy generation.
- » Habitat loss due to spread of alien vegetation
- » Visual impacts.
- » Positive social and economic impacts through job creation and economic benefits.

8.3 Sensitivity Analysis for the Development Area and Grid Connection Corridors

The potential high sensitivity areas which have been identified through the environmental scoping study across the full extent of the project site are listed below and illustrated in **Figure 8.1**. The scoping phase

²² the defined area (located within the development area) where the PV panel array and other associated infrastructure for San Solar PV is planned to be constructed. The San Solar PV development footprint will be defined during the EIA phase

sensitivity map provides an informed estimate of the sensitivity on the project site. The detail is based on the desktop review of available baseline information for the project site, as well as the sensitivity data from specialist studies undertaken during the scoping phase, which included field surveys. During the site and desktop surveys, the affected area was investigated in sufficient detail in order to provide definitive insight into the potential for constraining factors on the site. The sensitivity map must be used as a tool by the developer to avoid any areas flagged to be of higher risk or sensitivity and inform the location/layout of the development area and development footprint for the facility and associated grid connection infrastructure. The development footprint within the development area is the area which will be assessed further in detail in the EIA Phase in order to provide an assessment of environmental acceptability and suitability of the facility layout of the San Solar PV Facility.

Areas of high sensitivity already identified through the scoping study across the full extent of the broader project site include:

Critical Biodiversity Areas map

- » Ephemeral pans that are present within the northern portion of the site (pan features with temporary precipitation accumulation).
- » Area of deeper sands in the south of the site.
- » An Ecological Support Area (ESA), delineated in the Northern Cape Critical Biodiversity Areas map.
- » Identified habitat features that are considered to be 'key ecosystem providers' for avifauna

These are discussed further in the sections which follow.

Ecological Sensitive Features

The majority of the site consists of typical Kathu Bushveld dominated by *Senegalia mellifera* and *Tarchonanthus camphoratus*, which is considered low sensitivity on account of the generally low abundance of species of concern. In the south of the site, there is an area of deeper sands with a higher abundance of *Vachellia erioloba* which is considered High sensitivity, and which should preferably be avoided by the PV development. Across the rest of the site there are several small pans present, of which the larger pans are considered Very High sensitivity. The larger pans should be avoided, but the ecological significance of the smaller pans is relatively low and it would not significantly increase the impact of the development of some of these smaller pans were lost to the development. Overall, provided that the PV development footprint can be accommodated within the lower sensitivity parts of the site, the impact of the development would be relatively low and would be considered acceptable.

Avifauna Sensitive Features

The open Kathu Bushveld, the dense Kathu Bushveld and ephemeral pans habitat units comprising of potential sensitive avifauna features have been observed on the project site. The following preliminary avifauna sensitivities have been identified:

» Areas of high sensitivity

The open Kathu Bushveld and ephemeral pans are considered to be of high avifaunal sensitivity. The open Kathu Bushveld is an area which was historically transformed, and now with a less dense vegetation cover provides potential foraging habitat for large terrestrial bird species such as the Kori Bustard (*Ardeotis kori*).

The ephemeral pans provide ephemeral foraging opportunities for waterbirds and shorebird taxa, which are rare or absent in the area when these are dry. Many of these species are highly nomadic in the area. The pans are also important from a functional and dynamic perspective at the landscape level since these form

part of an "inter-connected" system or "stepping stones" of pans within the regional context, meaning that environmental conditions at these pans (e.g. water levels, salinity, food availability) are constantly changing depending on precipitation and evaporation. Therefore, none of the pans are exactly similar to another, thereby providing a continuous supply of resources for waterbirds when inundated.

The artificial livestock watering points often attract large numbers of granivore passerine and non-passerine bird species, of which many need to drink water on a daily basis. These areas are therefore of artificial origin and could be relocated to other areas or removed.

» **Areas of medium sensitivity**

The Kathu Bushveld (including Kathu Bushveld on deep red sands) which are prominent in the region and provides potential suitable foraging habitat for some collision-prone bird species, including the Northern Black Korhaan (*Afrotis afraoides*) and Red-crested Korhaan (*Lophotis ruficrista*). The reporting rates for threatened and near threatened bird species are anticipated to be relatively low in this unit, thereby suggesting a medium sensitivity rating instead of a high sensitivity even though the majority of the habitat is natural. In addition, Kathu Bushveld is widespread in the region.

The Kathu Bushveld on deep red sands is expected to sustain a higher number of bird species when compared to the other units.

» **Areas of low sensitivity**

These habitat units are represented by transformed types and roads and quarries.

Soils and Agricultural Potential Sensitive Features

There are no crop fields within the development area and the nearest area with a few small crop fields, are located 15km north-west of the development area. Even though the area is suitable for livestock farming, the long-term grazing of the entire development area is 13 ha/LSU. This is considered low-moderate grazing potential and livestock numbers must be strictly controlled, especially during periods of drought, to avoid overgrazing and land degradation.

The low agricultural potential of the site is further confirmed by the absence of any High Potential Agricultural Areas (HPAAs) in the vicinity of the development area. The nearest HPAAs are 170km away in a south-eastern and south-western direction. These HPAAs are associated with irrigation schemes and the availability of water that can be used for irrigation.

Heritage sensitive features, the cultural landscape (incl. archaeology, palaeontology, and cultural landscape)

Although the palaeosensitivity was identified as very high in terms of the SAHRIS Palaeontological Sensitivity Map, Almond and Pether (2009) describe these specific formations as having a low sensitivity for fossils. The Palaeosensitivity was identified as high in terms of the SAHRIS Palaeontological Sensitivity Map the geological structures suggest that the rocks are unlikely to contain fossils. Taking account of the defined criteria, the potential impact to fossil heritage resources is likely to be of a low significance. As such, the proposed development is unlikely to negatively impact significant palaeontological heritage resources. It has been recommended that the archaeology and the palaeontology study will not be necessary during the EIA phase.

Sense of Place

Visibility zones of the PV Facility mostly falls within vacant open space and agricultural land but does include some farm dwellings and residences. Potentially sensitive visual receptors include Haakboskern homestead and restaurant, the Limebank, Flatlands and Halliford homesteads, and viewers from sections of the R380 main road. Although the proposed infrastructure may be visible does not necessarily imply a high visual impact.

8.4 Demarcation of Development Area and Grid Connection Corridor

The San Solar PV facility is proposed to be situated on the Remaining extent of the Farm Wincanton 472 which has evaluated through the Scoping process as being suitable from an environmental perspective for a project of this nature. The larger project site of 991.5 ha was identified by the Applicant as suited to the development due to the availability of the solar resource, proximity to a viable grid connection, support from the local municipality, and willing landowner (as the Applicant is the landowner since 2015). Based on the outcomes of the scoping evaluation, some areas within the project site were excluded for development (high and very high sensitivity areas considered as no-go areas), and potentially more suitable areas were selected as the development area for further investigation through the EIA. Therefore, a funnel-down approach to site identification was followed in order to allow environmental sensitivity to inform the siting and preliminary layout design of the proposed facility.

The development area which shows a moderate or low impact to the environment was considered more suitable for development and has been demarcated as the 400ha area within which the facility layout will be designed. This area will be subject to the more detailed specialist field investigations in the EIA Phase. Therefore, the approach adopted allowed for the identification of specific environmental sensitive areas/receptors to be avoided and/or mitigated by the 400ha project development area.

Areas of assessment: The potential impact and appropriate siting of the infrastructure within the larger site has been informed by several specialist studies as listed in **Table 1.2** of this report. All infrastructure relating to the San Solar PV project will be assessed within the EIA phase within the following areas:

- » San Solar PV project site (within a 400 ha assessment/development area located within the broader project site)
- » The power line corridor (within a 500m corridor)

The consideration of the sensitivity of the site, and ultimately the suitability of the site for the San Solar PV project will be in line with a typical mitigation hierarchy:

- » First, avoidance of adverse impacts as far as possible by use of preventative measures (in this instance a sensitivity analysis assisted in the avoidance of identified ecologically sensitive areas)
- » Second, minimisation or reduction of adverse impacts to 'as low as practicable' (minimisation of impact on identified ecologically sensitive areas through implementing mitigation)
- » Third, remedy or compensation for adverse residual impacts, which are unavoidable and cannot be reduced further.

The identified development area for the San Solar PV facility overlain on the preliminary identified environmental sensitive features is indicated in **Figure 8.2**.

8.5 Overall Conclusion and Fatal Flaw Analysis

The potentially sensitive areas which have been identified through the environmental scoping study are illustrated in **Figure 8.1**. The scoping phase sensitivity map which provides an informed estimate of the sensitivity of the larger site, and specifically the demarcated development area is illustrated in **Figure 8.2**. The findings of the Scoping Study indicate that no environmental fatal flaws are associated with the San Solar PV project. While some impacts of potential high significance do exist, it is anticipated that avoidance of these areas and/or the implementation of appropriate mitigation measures would assist in reducing the significance of such impacts to acceptable levels. It is therefore recommended, that the development area for the development of the facility be outside of those areas identified as high sensitivity (no-go areas) as far as possible in order to ensure that the development does not have a detrimental impact on the environment. This forms part of the 'funnel-down approach' for the identification of an appropriate development footprint within the development area. Even with the appropriate avoidance of sensitive areas, there is an adequate area within the project site which can accommodate the planned 100MW facility with relatively low impacts on the environment. This identified area is referred to as the development area.

With an understanding of which areas within the development area and grid connection corridor are considered sensitive to the development of the proposed facility, the Applicant is able to design a detailed infrastructure layout for consideration by all relevant specialists in the EIA Phase. During the EIA phase, more detailed environmental studies will be conducted in line with the Plan of Study for EIA contained in **Chapter 9** of this Scoping Report. These studies will consider the detailed facility layout produced by the Applicant and make recommendations for the implementation of avoidance strategies (if required), and mitigation and management measures to ensure that the final assessed layout retains an environmental impact within acceptable limits. The sensitivity map will be further refined in the EIA phase on the basis of these specialist studies, in order to provide an assessment of environmental acceptability of the final design of the facility.

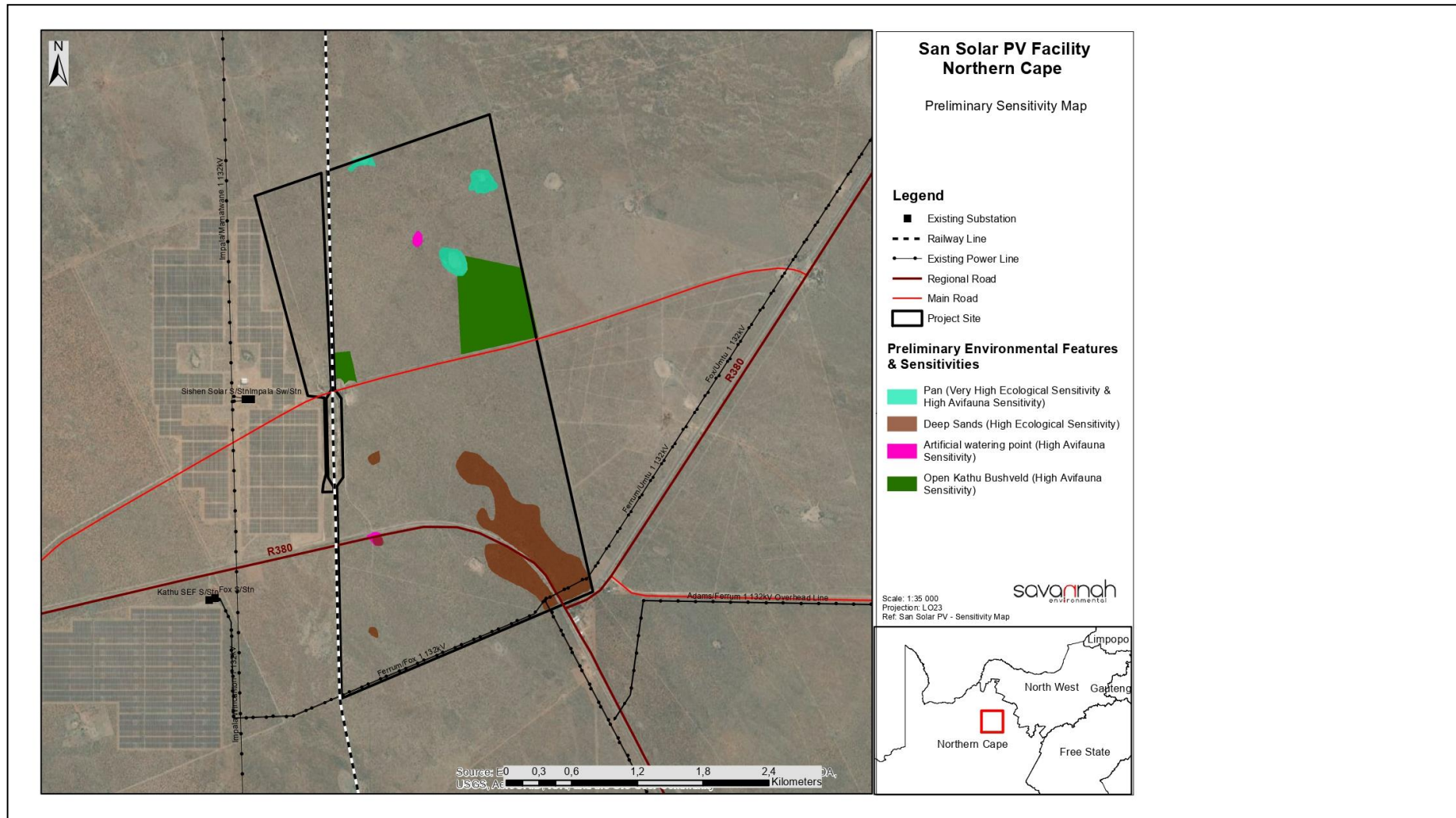


Figure 8.1: Environmental Sensitivity Map from the results of the scoping evaluation for the San Solar PV Facility and associated infrastructure. The sensitivity map indicates the sensitivities for the project site, as well as the San Solar PV development area (**Appendix K**)

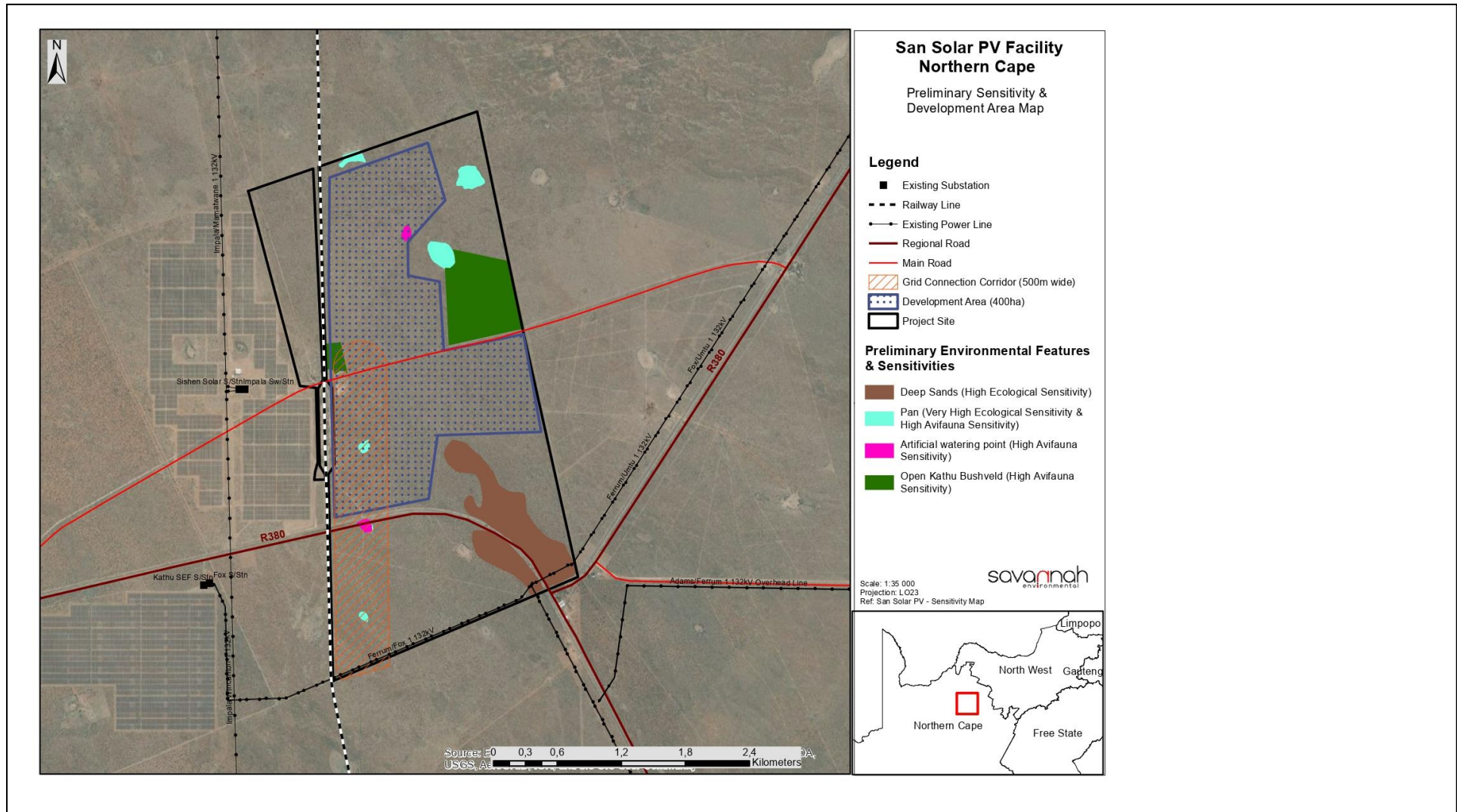


Figure 8.2: Development area map of the San Solar PV facility overlain on the preliminary identified environmental sensitive features (**Appendix K**)

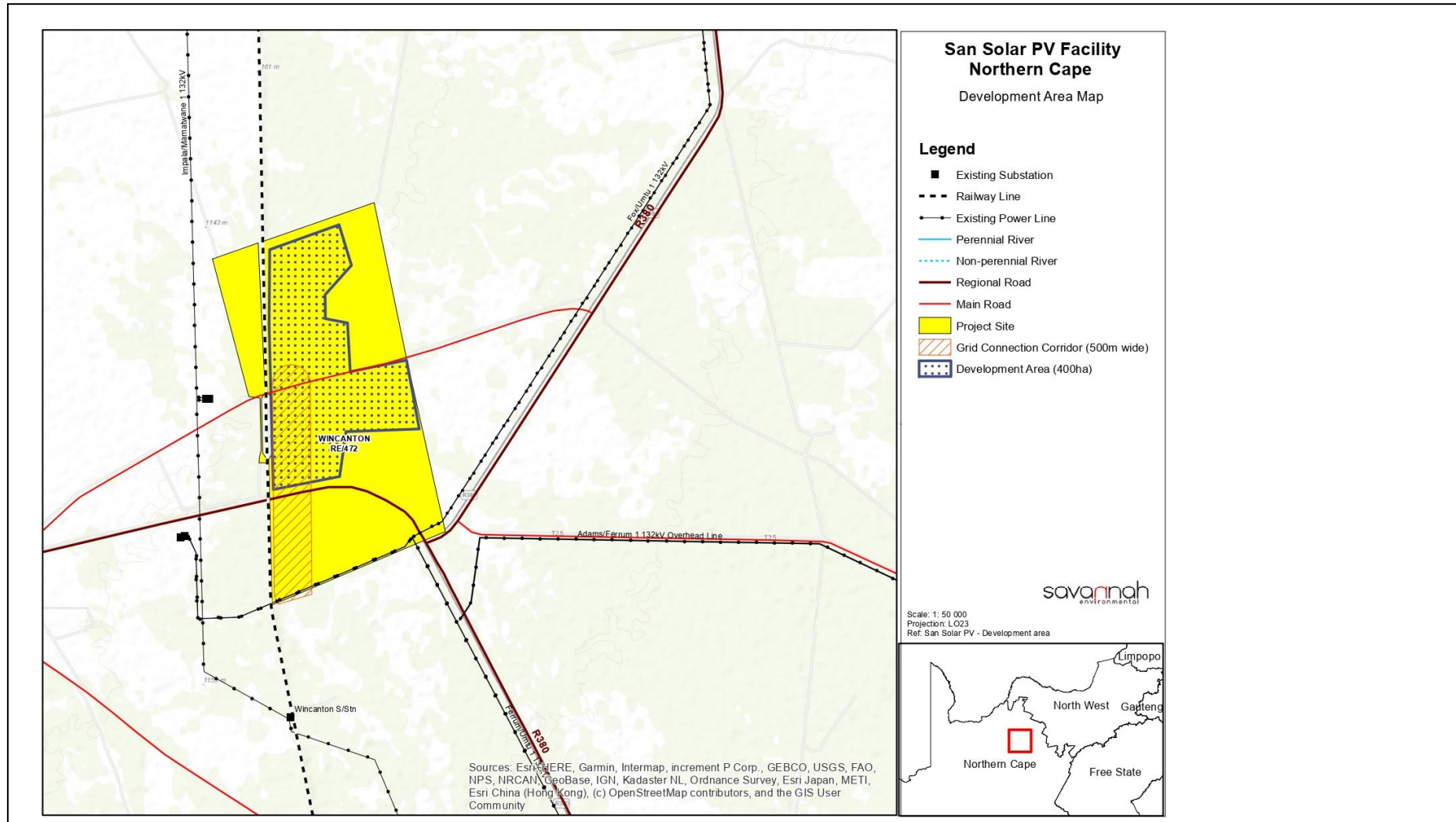


Figure 8.3: Development area map of the San Solar facility and associated grid connection corridor which will be assessed further in the EIA Phase (Appendix K)

CHAPTER 9: PLAN OF STUDY FOR EIA

One of the key objectives of the Scoping phase is to determine the level of assessment to be undertaken within the EIA Phase of the process. This will include the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken. This is to determine the impacts and risks a particular activity will impose on a preferred site through the life of the activity (including the nature, significance, consequence, extent, duration and probability of the impacts) to inform the location of the development footprint within the preferred site.

This Chapter contains the Plan of Study for the EIA for San Solar PV and associated infrastructure. The findings of the Scoping Phase include inputs from the EIA specialist team. The findings are used to inform the Plan of Study for EIA together with the requirements of the 2014 EIA Regulations (GNR 326) and applicable guidelines. The Plan of Study for EIA describes how the EIA Phase will proceed and includes details of the independent specialist studies required to be undertaken to assess the significance of those impacts identified within the Scoping Study to be of potential significance.

9.1 Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of an Impact Assessment Report

This chapter of the scoping report includes the following information required in terms of Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
<p>(h) a plan of study for undertaking the environmental impact assessment process to be undertaken, including -</p> <p>(i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;</p> <p>(ii) a description of the aspects to be assessed as part of the environmental impact assessment process;</p> <p>(iii) aspects to be assessed by specialists;</p> <p>(iv) a description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists;</p> <p>(v) a description of the proposed method of assessing duration and significance;</p> <p>(vi) an indication of the stages at which the competent authority will be consulted;</p> <p>(vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and</p> <p>(viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process;</p> <p>(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.</p>	<p>A plan of study for the undertaking of the EIA Phase for San Solar PV is included within this chapter.</p>

9.2 Objectives of the EIA Phase

The EIA will assess the potential direct, indirect and cumulative environmental impacts and benefits associated with each phase of the development including design, construction, operation, and decommissioning. The EIA will aim to provide the Competent Authority with sufficient information to make an informed decision regarding the proposed development. The site layout being proposed, will be assessed by a range of independent specialist studies. Furthermore, as required in terms of the 2014 EIA Regulations (GNR 326), the assessment will also include an assessment of the “do nothing” (i.e. no-go) alternative.

The EIA Phase will aim to achieve the following:

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

9.3 Consideration of Alternatives

The following project alternatives will be investigated in the EIA:

Type of Alternatives Considered	Description of the Alternatives relating to the San Solar PV
Site-specific Alternatives	The Farm which is owned by the Applicant has been identified for the development of the San Solar PV facility, taking into consideration the site-specific characteristics such as the solar irradiation. The project site which is 991.5ha in extent and in which a development area and grid corridor has been identified, is considered to be large enough for the development of a PV facility with a contracted capacity of up to 100MW, while allowing for avoidance of environmental sensitivities, as may be required in line with the mitigation hierarchy.
Design and Layout Alternatives	The layout for the development of the San Solar PV Facility will be designed in line with the environmental sensitivities identified during this scoping phase. The detailed facility layout will be made available as a layout alternative for assessment and ground-truthing by the independent specialists in the EIA phase. Where further conflicts are predicted, a mitigation strategy will be developed to meet the objectives of the mitigation hierarchy (avoid, minimise, mitigate), thereby ensuring that the layout plan taken forward for consideration during the EIA Phase is the most optimal from an environmental perspective.

'Do-nothing' Alternative	The option to not construct the San Solar PV Facility. The 'do-nothing' alternative assumes that the site remains in its current state, that is status quo, and that the current land use practises only continue.
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9.4 Exclusion of specialist studies during the EIA Phase

During the Scoping Phase the environmental features and sensitivities of the project site were identified and considered in terms of their sensitivity by specialist consultants. The San Solar PV facility is also planned to be located within an area previously authorised for a 75MW PV project, also known as the San Solar PV project (DEA ref no: 14/12/16/3/3/2/273, EA issued on 02 July 2013), and the findings are also based on full EIA level studies which were concluded for the same property. The nature, extent and significance of impacts is, therefore known for selected impacts. The following studies have, therefore, been considered by specialists to not be required to be assessed further in the EIA phase:

Heritage assessment, including archaeological, cultural landscape and palaeontology

» *Heritage (Archaeological and Palaeontology)*

A full heritage Impact assessment was undertaken and accepted by SAHRA in 2012 (Gaigher, 2012). Based on the findings of the 2012 heritage study, the current heritage screening report and the palaeontological impact assessment (refer to **Appendix G**), it is not considered likely that the development will impact significant archaeological or palaeontological heritage resources, and as such, the assessment of archaeology and palaeontology will not be necessary during the EIA phase. It may be possible that excavations associated with the development may unearth an insignificant archaeological find located below the ground surface and as such, it has been recommended by the specialist that:

- » Should ESA archaeological artefacts be uncovered during the course of excavation activities, work must cease in that area and SAHRA must be contacted regarding a way forward.
- » The Fossil Chance Finds Procedure is implemented for the duration of excavation activities.

» *Cultural Landscape*

Based on the findings of the heritage screening report (refer to **Appendix G**), which included the consideration of the cultural landscape, it is not anticipated that the proposed development will have a negative impact on any significant cultural landscape in the area due to the existing similar infrastructure here. Furthermore, it is often preferred to have development such as PV facilities clustered in one area to mitigate the sprawl of this infrastructure across otherwise pristine landscapes. As no impact to the cultural landscape is anticipated, no further assessment of impacts to the cultural landscape is recommended.

» *Freshwater*

An Ecological scoping study has been undertaken for the PV facility and is included as **Appendix D** of the Scoping Report. There is no natural permanent water or artificial earth dams within the project site. There are ephemeral pans in the north of the site. The development area/footprint will be able to completely avoid the ephemeral pans and no surface freshwater resource features will be impacted by the proposed development and as such no further assessment of impacts to the freshwater ecology is recommended or considered necessary.

9.5 Specialist Assessments to be undertaken during EIA Phase

A summary of the aspects which require further investigation within the EIA phase through specialist studies, as well as the proposed activities to be undertaken in order to assess and ground truth the significance of the potential impacts is provided within **Table 9.1**. The specialists proposed to undertake detailed studies in the EIA Phase are also reflected within this table. These specialist studies will consider the development footprint proposed for the PV facility and all associated infrastructure, as well as feasible and reasonable alternatives identified for the project. The terms of reference for each specialist includes the following:

Table 9.1: Impacts requiring further investigation during the EIA Phase, and activities to be undertaken in order to assess the significance of these potential impacts relevant to San Solar PV

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
<p>Ecology (Flora and Fauna)</p>	<p>This Terrestrial Biodiversity (Fauna and Flora and Terrestrial Habitat) Assessment will be conducted in accordance with the protocols and procedures (3(a-d)) as set out in Section 24(5)(a) and (h) of the National Environmental Act, 1998, which was gazetted in March 2020.</p> <p>The ecology impact assessment will be compiled and be informed by the results of a site survey, as well as due consideration of the walk-through survey which was conducted for the site in 2013 (Strohbach, 2013).</p> <p>Sensitivity Analysis and EIA assessment</p> <p>The following activities are proposed during the EIA Phase:</p> <ul style="list-style-type: none"> » Verify, in the field the draft sensitivity map as contained in this report. Particular attention would be paid to the pans that are present within the site as well as the area of deeper sands in the south of the site. This would confirm the sensitivity and no-go areas associated with these features. » Assess the density of protected trees at the site, in particular (<i>Vachelia erioloba</i> and <i>Boscia albitrunca</i>). » Check the habitat on-site to verify the potential presence of fauna of concern. Should the habitat suggest that species of concern may be present, specific measures to confirm the presence of such species on the site will be implemented as appropriate. » Validate the ESAs that are present on the site and assess whether or not these are located within the most appropriate areas and if not, provide evidence and maps to indicate the actual likely location of areas of higher importance for ecological processes. » Verify the nature and quality of the affected habitat in order to better assess the cumulative impacts that are likely to result from the development of the site as a PV facility. » Identify any additional mitigation and avoidance measures for inclusion in the EMP that should be implemented to further reduce the impacts of the development on terrestrial biodiversity. <p>Assessment of Impacts for the EIA</p> <p>This methodology described above assists in the evaluation of the overall effect of a proposed activity on the environment. It includes an assessment of the significant direct, indirect, and cumulative impacts. The significance of environmental impacts is to be assessed by means of criteria including extent (scale), duration, magnitude (severity), probability (certainty) and direction (negative, neutral or positive).</p>	<p>Simon Todd (3Foxes Biodiversity Solutions)</p>

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	<p>The nature of the impact will be defined and described. It will refer to the causes of the effect, what will be affected, and how it will be affected. For each anticipated impact, recommendations will be made for desirable mitigation measures.</p> <p>Environmental Management Programme</p> <p>For each overarching anticipated impact, management recommendations for the design, construction, and operational phase (where appropriate) will be drafted for inclusion in the project EMPr.</p>	
Avifauna	<p>An avifauna impact assessment report will be compiled and be informed by the results of two seasons of avifauna monitoring, conducted in line with the Best Practise guidelines for bird monitoring for solar facilities in South Africa.</p> <p>Sensitivity Analysis and EIA assessment</p> <p>The following activities are proposed during the EIA Phase:</p> <ul style="list-style-type: none"> » Consider the findings of a summer-season as well as a winter-season avifaunal survey against the planned infrastructure within the development footprint. » The following methods are proposed during the seasonal survey: <ul style="list-style-type: none"> • Active searching and the compilation of a bird inventory while traversing much of the available habitat types; • The determination of the occurrence of Red Data species and collision-prone bird species; • The identification and mapping of suitable habitat for species of conservation concern while focussing on structural and topographical cues; • A landscape analysis of important flyways or daily flight paths corresponding to important landscape features; and » Density estimates will be collected by means of point counts to evaluate the dominant/typical species and their respective relative densities at each site. At each point the number of bird species seen will be recorded, as well as their respective abundances and distance from the observer (by means of a rangefinder). Provide an assessment of cumulative impacts associated with the development of the project site. Including an assessment of the extent of habitat lost to solar energy development in the area to date, and the likely future potential loss from the current as well as other proposed developments in the area. » Evaluate, based on the site attributes and final layout of the proposed development, what the most applicable mitigation measures to reduce the impact of the proposed development on the project site would be, and if there are any areas where specific precautions or mitigation measures should be implemented. Particular attention will be paid to potential impacts on important landscape features in the vicinity of the site or where sensitive avifaunal species may nest or roost. » Identifying the species or habitat features that are 'key ecosystem providers' and complete sensitivity mapping 	Lukas Niemand (Pachnado Consulting)

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	<p>» Sensitivity ratings assigned and reasoning will be clearly defined.</p> <p>Assessment of Impacts for the EIA This methodology described above assists in the evaluation of the overall effect of a proposed activity on the environment. It includes an assessment of the significant direct, indirect, and cumulative impacts. The significance of environmental impacts is to be assessed by means of criteria including extent (scale), duration, magnitude (severity), probability (certainty) and direction (negative, neutral or positive).</p> <p>The nature of the impact will be defined and described. It will refer to the causes of the effect, what will be affected, and how it will be affected. For each anticipated impact, recommendations will be made for desirable mitigation measures.</p> <p>Environmental Management Programme For each overarching anticipated impact, management recommendations for the design, construction, and operational phase (where appropriate) will be drafted for inclusion in the project EMP.</p>	
<p>Soils, Land Use, Land Capability and Agricultural Potential</p>	<p>The soils impact assessment will include the consideration of aspects related to agricultural aspects in accordance with the protocols and procedures of GN 320 of 2020.</p> <p>Sensitivity Analysis and EIA assessment The following activities are proposed during the EIA Phase:</p> <ul style="list-style-type: none"> » Soil and agricultural survey all proposed infrastructure. The survey will include soil classification according to the Soil Classification: A Natural and Anthropogenic System for South Africa (Soil Classification Working Group, 2018). » The landowners and/or land users will be consulted individually for discussion of the productivity and employment data associated with the areas that will be impacted by the proposed development. The discussion will also address the limitations and risks of livestock production in the area in order to compare it to renewable energy production. » Assess the impacts identified in light of the site-specific findings and the final layout to be provided by the developer. » Appropriate mitigation measures as far as the disturbance of agricultural practices is concerned. <p>Assessment of Impacts for the EIA The methodology described above assists in the evaluation of the overall effect of a proposed activity on the environment. It includes an assessment of the significant direct, indirect, and cumulative impacts. The significance</p>	<p>Marine Pienaar (TerraAfrica)</p>

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	<p>of environmental impacts is to be assessed by means of the criteria of extent (scale), duration, magnitude (severity), probability (certainty) and direction (negative, neutral or positive).</p> <p>The nature of the impact will be defined and described. It will refer to the causes of the effect, what will be affected, and how it will be affected. For each anticipated impact, recommendations will be made for desirable mitigation measures.</p> <p>Environmental Management Programme For each overarching anticipated impact, management recommendations for the design, construction, and operational phase (where appropriate) will be drafted for inclusion in the project EMP.</p>	
<p>Visual impact</p>	<p>Sensitivity Analysis and EIA assessment The Visual Impact Assessment study to be undertaken in the EIA phase will include a level 3 assessment which includes:</p> <ul style="list-style-type: none"> » Determine Visual Distance/Observer Proximity to the facility - The proximity radii (calculated from the boundary lines of the facility). » Determine Viewer Incidence/Viewer Perception - Identify areas of high viewer incidence and to classify certain areas according to the observer's visual sensitivity towards the proposed facility and its related infrastructure. » Determine the Visual Absorption Capacity (VAC) of the landscape - The VAC is primarily a function of the vegetation, and will be low if the vegetation is, low growing sparse and patchy vegetation. » Determine the Visual Impact Index - The site-specific issues and potential sensitive visual receptors will be measured against this visual impact index and be addressed individually in terms of nature, extent, duration, probability, severity and significance of visual impact. » Identification and assessment of all potential impacts (direct, indirect and cumulative) identified in this scoping phase report and; » Recommendations will be made for the management of identified impacts. <p>Assessment of Impacts for the EIA This methodology described above assists in the evaluation of the overall effect of a proposed activity on the environment. It includes an assessment of the significant direct, indirect, and cumulative impacts. The significance of environmental impacts is to be assessed by means of the criteria of extent (scale), duration, magnitude (severity), probability (certainty) and direction (negative, neutral or positive).</p>	<p>Lourens du Plessis (LOGIS)</p>

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	<p>The nature of the impact will be defined and described. It will refer to the causes of the effect, what will be affected, and how it will be affected. For each anticipated impact, recommendations will be made for desirable mitigation measures.</p> <p>Environmental Management Programme</p> <p>For each overarching anticipated impact, management recommendations for the design, construction, and operational phase (where appropriate) will be drafted for inclusion in the project EMPr.</p>	
Social	<p>Sensitivity Analysis and EIA assessment</p> <p>The specialist study to be undertaken in the EIA phase will include:</p> <ul style="list-style-type: none"> » Describing and obtaining an understanding of the proposed development (type, scale, location), the communities likely to be affected and determining the need and scope of the SIA » Collecting baseline data on the current social environment and historical social trends » Interview directly affected and adjacent landowners, and key stakeholders to obtain primary information related to the project site, social environment, and to gain their inputs on the proposed project and its perceived social impact (positive and /or negative). » Assess impacts identified for the project in terms of their nature, extent, duration, magnitude, probability, status, and significance; as well as the degree to which the impact can be reversed, may cause irreplaceable loss of resources, and can be mitigated. » Identify mitigation measures with which to reduce negative impacts and enhance positive impacts for inclusion in the Environmental Management Programme (EMPr). As far as possible, the mitigation hierarchy of “avoid, minimise, and reduce” will be followed in the mitigation of potential negative impacts. » Identify any conditions for inclusion in the Environmental Authorisation (EA). » Provide a reasoned opinion regarding the acceptability of the project. <p>Assessment of Impacts for the EIA</p> <p>This methodology described above assists in the evaluation of the overall effect of a proposed activity on the environment. It includes an assessment of the significant direct, indirect, and cumulative impacts. The significance of environmental impacts is to be assessed by means of the criteria of extent (scale), duration, magnitude (severity), probability (certainty) and direction (negative, neutral or positive).</p> <p>The nature of the impact will be defined and described. It will refer to the causes of the effect, what will be affected, and how it will be affected. For each anticipated impact, recommendations will be made for desirable mitigation measures.</p>	<p>Nondumiso Bulunga (Savannah Environmental) And Tony Barbour</p>

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	<p>Environmental Management Programme</p> <p>For each overarching anticipated impact, management recommendations for the design, construction, and operational phase (where appropriate) will be drafted for inclusion in the project EMPr.</p>	

9.6 Assessment of Potential Impacts Associated with the Project

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

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

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

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

S = Significance weighting

E = Extent

D = Duration
M = Magnitude
P = Probability

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

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

The project applicant has the responsibility to avoid and / or minimise impacts as well as plan for their management (in terms of the 2014 EIA Regulations (GNR 326)), the mitigation of significant impacts will be discussed. Assessment of mitigated impacts will demonstrate the effectiveness of the proposed mitigation measures.

The results of the impact assessment studies, and other available information will be integrated by the Savannah Environmental project team. The EIA Report will be compiled in terms of the requirements of the 2014 EIA Regulations (GNR 326) and will include:

- » The details and expertise of the EAP who prepared the report.
- » The location of the activity and a locality map illustrating the location of the proposed activity.
- » A description of the scope of the proposed activity including all listed activities triggered and a description of associated structures and infrastructure.
- » The policy and legislative context within which the development is located and an explanation of how the development complies and responds to the legislation and policy context.
- » The need and desirability of the proposed development of the activity in the context of the preferred location.
- » A motivation for the preferred development footprint within the approved site.
- » A description of the process followed to reach the proposed development footprint within the approved site, including:
 - * Details of the development footprint considered.
 - * Details of the public participation process undertaken in terms of Regulation 41 of the 2014 EIA Regulations, including copies of supporting documents.
 - * A summary of issues raised by interested and affected parties and the manner in which the issues were incorporated.
 - * The environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.
 - * The impacts and risks identified including the nature, significance, consequence extent, duration and probability of the impacts, including the degree to which these impacts can be reversed, may cause irreplaceable loss of resources and can be avoided, managed or mitigated.
 - * The methodology used for determining and ranking the nature, significance, consequence, extent, duration and probability of potential environmental impacts and risks.
 - * Positive and negative impacts that the activity and alternatives will have on the environment and the community.

- * Possible mitigation measures to be applied and the level of residual risk.
 - * A motivation for not considering alternative development footprint.
 - * A concluding statement indicating the preferred alternative development footprint.
 - * A full description of the process followed to identify, assess and rank impacts of the activity and associated infrastructure on the preferred location including all environmental issues and risks that have been identified and an assessment of the significance of each issue and risk and the extent to which the issue/risk can be avoided or mitigated.
- » An assessment of the identified potentially significant impacts and risks.
 - » A summary of the findings and recommendations of any specialist report and an indication as to how these findings and recommendations have been included.
 - » An environmental impact assessment containing a summary of key findings, an environmental sensitivity map, and a summary of the positive and negative impacts and risks of the proposed activity.
 - » Recommendations from specialist, the recording of proposed impact management objectives and the impact management outcomes for inclusion in the EMPr as well as inclusion as conditions of authorisation.
 - » The final alternatives which respond to the impact management measures, avoidance and mitigation measures identified.
 - » Any aspects which were conditional to the findings of the assessment.
 - » A description of the assumptions, uncertainties and gaps in knowledge relating to the assessment and mitigation measures proposed.
 - » An opinion as to whether the proposed activity should or should not be authorised and the conditions thereof.
 - » An undertaking or affirmation by the EAP in relation to the correctness of the information, the inclusion of comments and inputs from stakeholders and Interested and affected parties, the inclusion of inputs and recommendations from the specialists, and 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.

The EIA Report will be released to the public and relevant stakeholders, Organs of State and Authorities for a 30-day review period. Comments received from I&APs will be captured within a Comments and Response Report, which will be included within the EIA Report, for submission to DFFE for decision-making.

9.7 Authority Consultation

Consultation with the regulating authorities (i.e. DFFE and Northern Cape DAEARD&LR) will continue to be undertaken and will continue throughout the EIA process. On-going consultation will include the following:

- » Submission of a Scoping Report following the 30-day public review period (and consideration of comments received).
- » Submission of an EIA Report for review and comment.
- » Submission of a EIA Report following a 30-day public review period (and consideration of comments received).
- » Consultation and a site visit with DFFE in order to discuss the findings and conclusions of the EIA Report, if required

9.8 Public Participation Process

A public participation process will be undertaken by Savannah Environmental during the EIA phase. The Public Participation will be undertaken in line with the approved Public Participation Plan as per the correspondence from DFFE (**Appendix C**). Consultation with key stakeholders and I&APs will be on-going throughout the EIA Phase. Through this consultation process, stakeholders and I&APs will be encouraged to verify that their issues were recorded in the Scoping Phase, and to identify additional issues of concern or highlight positive aspects of the proposed project, and to comment on the findings of the EIA Phase. In order to accommodate the varying needs of stakeholders and I&APs within the study area, as well as capture their inputs, various opportunities will be provided for stakeholders and I&APs to be involved in the EIA Phase of the process, as follows:

- » Focus group meetings (pre-arranged and I&APs invited to attend) via the use of virtual platforms (Zoom or MS Teams).
- » One-on-one consultation meetings (for example with directly affected and surrounding landowners) via telephone or virtual platforms.
- » Telephonic consultation sessions (consultation with various parties from the EIA project team).
- » Written, faxed or e-mail correspondence.

The EIA Report will be made available for a 30-day review period prior to finalisation and submission to the DFFE for decision-making. In order to provide an overview of the findings of the EIA process and facilitate comments, a public meeting will be held during this public review period, depending on the specific needs of the stakeholders in the area. All comments received during the public review period will be included within the final report to be submitted to the DFFE for review and decision-making.

9.9 Key Milestones of the Programme for the EIA

The envisaged key milestones of the programme for the EIA Phase are outlined in the following table (and include indicative dates):

Key Milestone Activities	Proposed timeframe ²³
Make Scoping Report available to the public, stakeholders and authorities (30 days)	08 March 2022 – 11 April 2022
Finalisation of Scoping Report, and submission of the Final Scoping Report to DFFE	April 2022
Authority acceptance of the Final Scoping Report and Plan of Study to undertake the EIA (43 days)	Within 43 days of receipt of the Final Scoping Report
Make EIA Report and EMPr available to the public, stakeholders and authorities (30 days)	June/July 2022
Finalisation of EIA Report, and submission of the Final EIA Report to DFFE	July 2022
Authority review period and decision-making (107 days)	Within 107 days of submission of the Final EIA Report to the DFFE

²³ Indicative dates.

CHAPTER 10: REFERENCES

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Heritage Scoping Report

Nid	Report Type	Author/s	Date	Title
109484	Heritage Statement	Stephan Gaigher	09/05/2012	HERITAGE IMPACT ASSESSMENT REPORT ENVIRONMENTAL IMPACT ASSESSMENT PHASE Proposed establishment of the San Solar Energy Facility located south of Kathu on a Portion of the Farm Wincanton 472, Northern Cape Province.
110652	HIA Phase 1	Stephan Gaigher	01/02/2013	HERITAGE IMPACT ASSESSMENT REPORT ENVIRONMENTAL IMPACT ASSESSMENT PHASE Proposed establishment of the San Solar Energy Facility located south of Kathu on a Portion of the Farm Wincanton 472, Northern Cape Province
110765	HIA Phase 1	Stephan Gaigher	26/02/2013	HERITAGE IMPACT ASSESSMENT REPORT ENVIRONMENTAL IMPACT ASSESSMENT PHASE Proposed establishment of the San Solar Energy Facility located north of Kathu on a Portion of the Farm Wincanton 472, Northern Cape Province
114648	PIA Desktop	John E Almond	01/09/2012	Palaeontological specialist assessment: desktop study PROPOSED 16 MTPA EXPANSION OF TRANSNETS EXISTING MANGANESE ORE EXPORT RAILWAY LINE & ASSOCIATED INFRASTRUCTURE BETWEEN HOTAZEL AND THE PORT OF NGQURA, NORTHERN & EASTERN CAPE. Part 1: Hotazel to Kimberley, Northern Cape
129751	HIA Phase 1	Elize Becker	20/02/2013	Phase 1 Heritage Impact Assessment Hotazel to Kimberley and De Aar to Port of Ngqura
153307	Heritage Impact Assessment Specialist Reports	Robert de Jong	22/02/2011	Kalahari Solar Power Project Heritage Impact Assessment Report and Heritage Management Plan developed by Robert De Jong and Associates
157923	Heritage Scoping	R. C. De Jong	10/12/2010	Heritage Scoping Report for the Proposed Kalahari Solar Project on Portions of the Farm Kathu 465, Kuruman Registration Division, Gamagara Local Municipality, Northern Cape Province
159473	AIA Phase 1	Johnny Van Schalkwyk		Archaeological impact survey report for THE PROPOSED DEVELOPMENT OF A SOLAR POWER PLANT ON THE FARM BESTWOOD 459, KATHU REGION, NORTHERN CAPE PROVINCE
160089	AIA Phase 1	Johnny Van		Archaeological impact survey report for THE PROPOSED KALAHARI SOLAR PARK DEVELOPMENT ON

		Schalkwyk		THE FARM KATHU 465, NORTHERN CAPE PROVINCE
251329	Heritage Impact Assessment Specialist Reports	Jayson Orton	20/02/2015	Heritage Impact Assessment for a Proposed 132 kV Power Line, Kuruman Magisterial District, Northern Cape
272118	Archaeological Specialist Reports	Jayson Orton, Steven Walker	20/04/2015	Archaeological Survey for the Proposed Kalahari Solar Project, Kuruman Magisterial District, NC Province
273602	Heritage Impact Assessment Specialist Reports	Polke Birkholtz	20/04/2015	Heritage Impact Assessment for the Proposed Establishment of a Grazing Project on a Portion of the Farm Marsh 467, Dingleton, Gamagara Local Municipality, Northern Cape.
363711	Heritage Impact Assessment Specialist Reports	Johann van Schalkwyk	01/03/2016	Cultural heritage impact assessment for THE DEVELOPMENT OF THE PROPOSED BOITSHOKO SOLAR POWER PLANT ON THE REMAINING EXTENT OF PORTION 1 OF THE FARM LIMEBANK NO 471 REGISTRATION DIVISION KURUMAN, NORTHERN CAPE PROVINCE
363712		Lloyd Rossouw	01/03/2016	Phase 1 Palaeontological Assessment of the proposed Boitshoko solar power plant (SPP) facility on the Remaining Extent of Portion 1 of the farm Limebank 471, near Kathu, Northern Cape Province.
7038	AIA Phase 1	David Morris	07/11/2010	PROPOSED KATHU-SISHEN SOLAR ENERGY FACILITIES. SPECIALIST INPUT FOR THE ENVIRONMENTAL IMPACT ASSESSMENT PHASE AND ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED KATHU SISHEN SOLAR ENERGY FACILITIES, NORTHERN CAPE
8944	PIA Phase 1	John Pether	17/01/2011	BRIEF PALAEOLOGICAL IMPACT ASSESSMENT (Desktop Study) PROPOSED KATHU & SISHEN SOLAR ENERGY FACILITIES Portions 4 & 6 of the Farm WINCANTON 472 Kuruman District, Northern Cape
93163	HIA Phase 1	Stephan Gaigher	09/05/2012	Heritage Impact Assessment Report Environmental Impact Assessment Phase: Proposed Establishment of the San Solar Energy Facility, Located North of Kathu on a Portion of Farm Wincanton 472, Northern Cape Province

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