



**Bonsmara Solar PV (RF) (Pty) Ltd**

# **Bonsmara Solar PV Facility near Kroonstad, Free State Province**

## **Visual Impact Assessment**

**DFFE Reference: TBC**

**Report Prepared by: Kelly Armstrong and Chris Dalglish**

**Issue Date: 3 October 2022**

**Version No.: 2**

# Bonsmara Solar PV (RF) (Pty) Ltd

## Bonsmara Solar PV Facility near Kroonstad, Free State Province

### Visual Impact Assessment

#### **EXECUTIVE SUMMARY**

Bonsmara Solar PV (RF) (Pty) Ltd proposes to develop the 100 MW Bonsmara Solar Photovoltaic (PV) Facility, Battery Energy Storage System and associated infrastructure on a site ~12 km south-east of Kroonstad, in the Free State Province (project). The PV Facility will occupy ~390 ha across Portion 0 and Portion 1 of Farm 636 in Moqhaka Local Municipality. A 2 km long 132 kV powerline will evacuate power to the grid by connecting the on-site substation to the Kroonstad Switching Station.

SRK Consulting (South Africa) (Pty) Ltd has been appointed by SiVEST (SA) (Pty) Ltd to undertake the Visual Impact Assessment to inform the Environmental Impact Assessment process required in terms of the National Environmental Management Act 107 of 1998, conducted by SiVEST.

Impacts of the PV Facility components and the grid connection component (132 kV powerline and on-site substation) are assessed separately and are likely to be associated with visual intrusion and visual quality.

Construction (and decommissioning) activities associated with the PV Facility and the 132 kV powerline are anticipated to be visually intrusive. The impact is assessed to be of *medium* significance and with implementation of mitigation is reduced to *low*.

During the operational phase it is anticipated that the PV array, BESS, internal grid infrastructure, substation and 132 kV powerline will alter the sense of place and be visually intrusive. These impacts are assessed to be of *high*, *medium* and *low* significance respectively, and with the implementation of mitigation is reduced to *medium* or *low*. The visual impact of nightglow is anticipated to be of *medium* significance and with the implementation of mitigation is reduced to *low*.

Key mitigation measures include:

- Limit vegetation clearance and the footprint of construction to what is absolutely essential;
- Consolidate the footprint of the construction camp to a functional minimum;
- Avoid excavation, handling and transport of materials which may generate dust under very windy conditions;
- Keep stockpiled aggregate and sand covered to minimise dust generation;
- Keep construction site tidy;
- Plant vegetation (that will reach >3 m in height) or establish a vegetated berm (>3 m) along the south-western boundary of the site bordering the R76;
- Install the 33 kV powerlines underground, where possible;
- Fence the perimeter of the site with a green or black fencing;
- Ensure that the roof colour of the proposed buildings blends into the landscape;

- Do not install or affix lights on pylons;
- Reduce the height of lighting masts to a workable minimum; and
- Direct lighting inwards and downwards to limit light pollution.

The visual quality and sense of place is already affected by existing substations and powerlines within the visual landscape. As such, the proposed powerlines, BESS and substations associated with this project will not be the first of their kind. A number of other PV facilities are proposed in the 35 km radius of the proposed project, however, are located far apart and do not constitute a spatially concentrated, high-density network of PV facilities. Therefore, the cumulative impact of the PV facility and 132 kV powerline is assessed to be of medium significance and with the implementation of mitigation is reduced to low.

This project will be largely incongruent with the existing agricultural landscape. As such, visual impacts include altered sense of place, visual intrusion and light pollution. This VIA demonstrates that the project will generally result in a moderate visual impact, despite not being located within a REDZ. The construction, operational, decommissioning and cumulative impacts are deemed to be acceptable on the assumption that the mitigation measures listed in this VIA are implemented.

Based on the assessment and the assumption that the proposed mitigation measures will be implemented, the specialist is of the opinion that the visual impacts of the project are acceptable and, from a visual perspective, there is no reason not to authorise the project.

**NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) AND ENVIRONMENTAL IMPACT REGULATIONS, 2014 (AS AMENDED) - REQUIREMENTS FOR SPECIALIST REPORTS (APPENDIX 6)**

<b>Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6</b>	<b>Section of Report</b>
1. (1) A specialist report prepared in terms of these Regulations must contain- a) details of- i. the specialist who prepared the report; and ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	1.3
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Page 6
c) an indication of the scope of, and the purpose for which, the report was prepared;	1
(cA) an indication of the quality and age of base data used for the specialist report;	1.4.3
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	6
d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	1.4.3
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	1.4
f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	6 and 7
g) an identification of any areas to be avoided, including buffers;	7
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	N/A
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	2
j) a description of the findings and potential implications of such findings on the impact of the proposed activity, (including identified alternatives on the environment) or activities;	7, and 8
k) any mitigation measures for inclusion in the EMPr;	7.9

Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6	Section of Report
l) any conditions for inclusion in the environmental authorisation;	8.1
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	7.9
n) a reasoned opinion- <ul style="list-style-type: none"> <li>i. (as to) whether the proposed activity, activities or portions thereof should be authorised;               <ul style="list-style-type: none"> <li>(iA) regarding the acceptability of the proposed activity or activities; and</li> </ul> </li> <li>ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;</li> </ul>	8.1
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	N/A
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	N/A
q) any other information requested by the competent authority.	N/A
2) Where a government notice <i>gazetted</i> by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	N/A



## environmental affairs

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA

### DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

#### PROJECT TITLE

Bonsmara Solar PV Facility near Kroonstad, Free State Province

#### Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at <https://www.environment.gov.za/documents/forms>.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
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Pretoria  
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**Physical address:**

Department of Environmental Affairs  
Attention: Chief Director: Integrated Environmental Authorisations  
Environment House  
473 Steve Biko Road  
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:  
Email: [EIAAdmin@environment.gov.za](mailto:EIAAdmin@environment.gov.za)

## 1. SPECIALIST INFORMATION

Specialist Company Name:	SRK Consulting (South Africa) (Pty) Ltd			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	1	Percentage Procurement recognition	125%
Specialist name:	Kelly Armstrong			
Specialist Qualifications:	BSocSc (Hons) Environmental Science			
Professional affiliation/registration:	N/A			
Physical address:	183 Main Road, Albion Spring Close, Rondebosch, 7700			
Postal address:	Postnet Suite #206, P. Bag X18, Rondebosch, 7701			
Postal code:	7700	Cell:	076 114 9254	
Telephone:	021 659 3060	Fax:	086 530 7003	
E-mail:	karmstrong@srk.co.za			

## 2. DECLARATION BY THE SPECIALIST

I, Kelly Armstrong, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

\_\_\_\_\_  
Signature of the Specialist

\_\_\_\_\_  
SRK Consulting (South Africa) (Pty) Ltd

\_\_\_\_\_  
Name of Company:

\_\_\_\_\_  
Date:

## 3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, \_\_\_\_\_ Kelly Armstrong \_\_\_\_\_, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

---

Signature of the Specialist

---

SRK Consulting (South Africa) (Pty) Ltd

---

Name of Company

---

Date

---

Signature of the Commissioner of Oaths

---

Date



# Bonsmara Solar PV (RF) (Pty) Ltd

## Bonsmara Solar PV Facility near Kroonstad, Free State Province

### Visual Impact Assessment

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## Glossary of Terms

This list contains definitions of symbols, units, abbreviations, and terminology that may be unfamiliar to the reader.

Landscape Integrity	The compatibility of the development/visual intrusion with the existing landscape.
Sense of Place	The identity of a place related to uniqueness and/or distinctiveness. Sometimes referred to as genius loci meaning 'spirit of the place'.
Viewshed	The topographically defined area from which the project could be visible.
Visibility	The area from which the project components would actually be visible and which depends upon topography, vegetation cover, built structures and distance.
Visual Absorption Capacity	The potential for the area to conceal the proposed development.
Visual Character	The elements that make up the landscape including geology, vegetation and land-use of the area.
Visual Exposure	The zone of visual influence or viewshed. Visual exposure tends to diminish exponentially with distance.
Visual Impact	A change to the existing visual, aesthetic or scenic environment, either adverse or beneficial, that is directly or indirectly due to the development of the project and its associated activities.
Visual Intrusion	The effect of the artificial insertion (construction) of an object into a landscape, typically – but not always - reducing the visual quality of the environment, and sense of place.
Visual Quality	The experience of the environment with its particular natural and cultural attributes.
Visual Receptors	Potential viewers (individuals or communities) who are subjected to the visual influence of a project.

### List of Abbreviations

BESS	Battery Energy Storage System
CSP	Concentrated Solar Power
DEA&DP	Department of Environmental Affairs and Development Planning
DFFE	Department of Forestry, Fisheries and the Environment
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
mamsl	Metres Above Mean Sea Level
MW	Megawatt
NEMA	National Environmental Management Act 107 of 1998
PV	Photovoltaic
REDZ	Renewable Energy Development Zone
SIVEST	SiVEST Environmental
SRK	SRK Consulting (South Africa) (Pty) Ltd
ToR	Terms of Reference
VAC	Visual Absorption Capacity
VIA	Visual Impact Assessment
VP	Viewpoint
WEF	Wind Energy Facility

**Bonsmara Solar PV (RF) (Pty) Ltd**

**Bonsmara Solar PV Facility near Kroonstad, Free State Province**

**Visual Impact Assessment**

## **1. INTRODUCTION**

Bonsmara Solar PV (RF) (Pty) Ltd proposes to develop the 100 MW Bonsmara Solar Photovoltaic (PV) Facility, Battery Energy Storage System (BESS) and associated infrastructure on a site approximately 12 km south-east of the town of Kroonstad, in the Free State Province (the project - Figure 1-1) The PV Facility and BESS will be located on Portion 0 of Farm 636 and Portion 1 of Farm 636 located in the Moqhaka Local Municipality, in the Fezile Dabi District Municipality. A 2 km long 132 kV powerline will evacuate power to the grid by connecting the on-site substation to the Kroonstad Switching Station.

SRK Consulting (South Africa) (Pty) Ltd (SRK) has been appointed by SiVEST Environmental (SiVEST) to undertake the Visual Impact Assessment (VIA) to inform the Environmental Impact Assessment (EIA) process required in terms of the National Environmental Management Act 107 of 1998 (NEMA), conducted by SiVEST.

### **1.1 Scope and Objectives**

The primary aims of the study are to describe the visual baseline, assess the visual impacts of the project and identify effective and practicable mitigation measures. The VIA informs the EIA process required in terms of NEMA, and conducted by SiVEST.

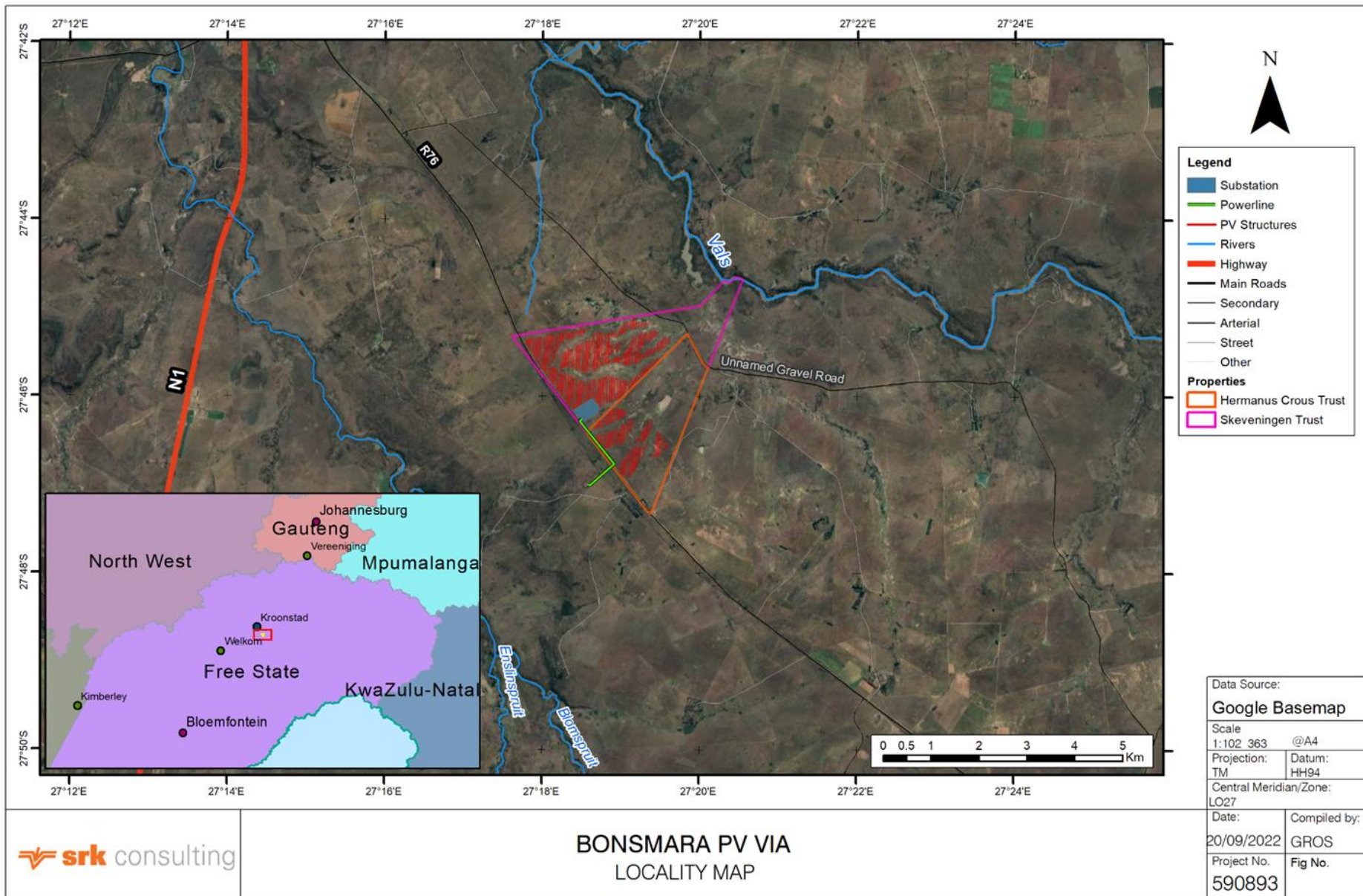


Figure 1-1: Locality map



## 1.2 Terms of Reference

The Terms of Reference (ToR) for the study are as follows:

- Describe the baseline visual characteristics of the study area, including landform, visual character and sense of place, and place this in a regional context;
- Identify potential impacts of the project on the visual environment through analysis and synthesis of the following factors:
  - Visual exposure;
  - Visual absorption capacity (VAC);
  - Sensitivity of viewers (visual receptors);
  - Viewing distance and visibility; and
  - Landscape integrity;
- Assess potential the impacts of the project on the visual environment and sense of place using SiVEST's impact assessment methodology (see Appendix B);
- Identify and assess the direct, indirect and cumulative impacts (pre- and post-mitigation) of the proposed project (and alternatives, if applicable) on visual resources in relation to other proposed and existing developments in the surrounding area;
- Compile a report compliant with Appendix 6 of the EIA Regulations and any relevant legislation and guidelines; and
- Recommend practicable mitigation measures to avoid and/or minimise impacts and/or optimise benefits.

## 1.3 Specialist Credentials

The VIA was conducted by staff listed in Table 1-1.

Table 1-1: VIA staff

Staff	Role	Qualification
Christopher Dalgliesh	Project Review and Director	Chris Dalgliesh is a Partner and Principal Environmental Consultant with over 35 years' experience, primarily in South Africa, Southern Africa, West Africa and South America (Suriname). Chris has worked on a wide range of projects, notably in the natural resources, Oil & Gas, waste, infrastructure (including rail and ports) and industrial sectors. He has managed and regularly reviews Visual Impact Assessments. He has directed and managed numerous Environmental and Social Impact Assessments (ESIAs) and associated management plans, in accordance with international standards. He regularly provides high level review of ESIAs, frequently directs Environmental and Social Due Diligence studies for lenders, and also has a depth of experience in Strategic Environmental Assessment, State of Environment Reporting and Resource Economics. He

		holds a BBusSci (Hons) and M Phil (Env) and is a registered Environmental Assessment Practitioner.
Kelly Armstrong	Specialist Consultant	Kelly Armstrong is an Environmental Consultant at SRK Consulting. She has four years' experience in managing Basic Assessment, Environmental Impact Assessment and Water Use Authorisation processes and acting as an Environmental Control Officer in the renewable energy, residential, aquaculture, marine and mining sectors. She also manages and contributes to Visual Impact Assessments for infrastructure, renewable energy and mining projects. Kelly holds a BSocSc (Hons) in Environmental and Geographical Studies from the University of Cape Town.

## 1.4 Assessment Methodology

Visual impacts are a function of the physical transformation of a landscape on account of the introduced object, and the experiential perceptions of viewers.

Given the subjective nature of visual issues, assessing the visual impacts of a project in absolute and objective terms is not achievable. Thus, qualitative as well as quantitative techniques are required.

In this VIA, emphasis has therefore been placed on ensuring that the methodology and rating criteria are clearly stated and transparent. The focus of the study is to determine the character and sensitivity of the visual environment, identify visual receptors and viewing corridors and identify and assess potential visual impacts and mitigation measures.

### 1.4.1 Approach

The approach adopted for the VIA is intended to be as accurate and thorough as possible. Analytical techniques are selected to endorse the reliability and credibility of the assessment.

The approach to and reporting of the VIA study comprises three major, phased elements (as summarised in Figure 1-2 below):

- Description of the visual context;
- Identification and discussion of the potential visual impacts; and
- Assessment of those potential impacts.

Visual impacts are assessed as one of many interrelated effects on people (i.e. the viewers and the impact of an introduced object into a particular view or scene) (Young, 2000). In order to assess the visual impact the project has on the affected environment, the visual context (baseline) in which the project is located must be described. The inherent value of the visual landscape to viewers is informed by geology / topography, vegetation and land-use and is expressed as Visual Character (overall impression of the landscape), Visual Quality (how the landscape is experienced) and Sense of Place (uniqueness and identity).

Visual impact is measured as the change to the existing visual environment caused by the project as perceived by the viewers (Young, 2000). The visual impact(s) may be negative, positive or neutral (i.e. the visual quality is maintained). The magnitude or intensity of the visual impacts is determined through analysis and synthesis of the VAC of the landscape (potential of the landscape to absorb the project), zone of visual

influence or exposure<sup>1</sup>, visibility (viewing distances), compatibility of the project with landscape integrity (congruence) and the sensitivity of the viewers (receptors).

Sources of visual impacts are identified for the construction, operational and decommissioning phases of the project. The significance of those visual impacts is then assessed using the prescribed impact rating methodology, which includes the rating of:

- Impact consequence, determined by extent, duration and magnitude/intensity of impact (see above);
- Impact probability;
- Impact significance, determined by combining the ratings for consequence and probability; and
- Confidence in the significance rating.

The significance rating methodology is described in more detail in Appendix B.

Mitigation measures recommended to avoid and/or reduce the significance of negative impacts, or to optimise positive impacts, are identified for the project. Impact significance is re-assessed assuming the effective implementation of mitigation measures.

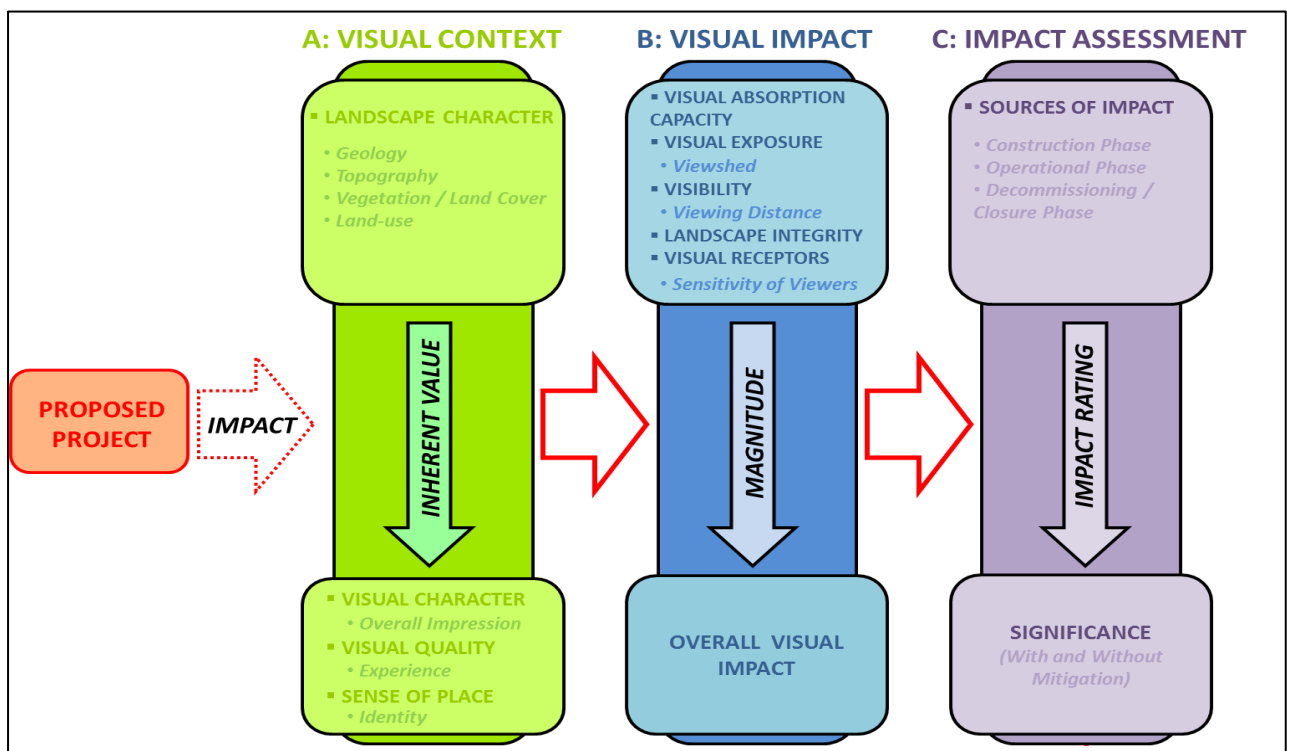


Figure 1-2: Approach to and method for the VIA

#### 1.4.2 Method

The following method was used to assess the visual context (baseline) for the project:

1. Describe the project using information supplied by the proponent and EIA team;

<sup>1</sup> Visual exposure of a project can be determined through the analysis of viewsheds, however due to the existing road infrastructure and congruence of the proposed project with the existing infrastructure in the project area viewshed analysis will not be undertaken.

2. Collect and review visual data, including data on topography, vegetation cover, land-use and other background information;
3. Undertake fieldwork, comprising a reconnaissance of the study area, particularly the project site and key viewpoints. The objectives of the fieldwork were to:
  - Familiarise the specialist with the site and its surroundings;
  - Identify key viewpoints / corridors; and
  - Determine and groundtruth the existing visual character and quality in order to understand the sensitivity of the landscape.

Visual 'sampling' using photography was undertaken to illustrate the likely zone of influence and visibility. The location of the viewpoints was recorded with a GPS;

4. Undertake a mapping exercise to define the visual character of the study area; and
5. Identify sensitive receptors.

The following method was used to assess the visual impact of the project:

1. Determine the visual zone of influence or exposure by superimposing the proposed development on aerial imagery, and verified during the site visit;
2. Make field observations at key viewpoints to determine the likely distance at which visual impacts will become indistinguishable;
3. Rate impacts on the visual environment and sense of place based on professional opinion and the prescribed impact rating methodology;
4. Recommend practicable mitigation measures to avoid and/or minimise impacts; and
5. Provide environmental management measures to be included in the Environmental Management Programme for the project (EMPr).

#### 1.4.3 *Site Visit and Data Acquisition*

A site visit was undertaken on 13 September 2022. The site visit duration and timing were appropriate to provide the specialist with a representative impression of the site and surroundings.

The following additional information sources were used:

- Maps indicating the location and layout of the project;
- Topographic data, including spatial files with 5 m contours obtained from the Department of Rural Development and Land Reform;
- Aerial images; and
- Other available data on geology, vegetation, land use, receptors etc.

The information is sufficiently recent and detailed to provide appropriate inputs into the VIA.

## 2. ASSUMPTIONS AND LIMITATIONS

As is standard practice, the VIA is based on a number of assumptions and is subject to certain limitations, which should be borne in mind when considering information presented in this report. These assumptions and limitations include:

- VIA is not, by nature, a purely objective, quantitative process, and depends to some extent on subjective judgments. Where subjective judgments are required, appropriate criteria and motivations for these have been clearly stated;
- The study is based on technical information supplied to SRK, which is assumed to be accurate. This includes the proposed locations, dimensions and layouts of the project components;
- This study conservatively assumes a single contiguous PV array of approximately ~390 ha;
- The study area is defined as the area within a 5 km radius of the site, as the visual impact beyond this distance is considered negligible; and
- This study does not provide motivation for or against the project, but rather seeks to give insight into the visual character and quality of the area, its VAC and the potential visual impacts of the project.

The findings of the VIA are not expected to be affected by these assumptions and limitations.

## 3. TECHNICAL DESCRIPTION

This section provides a concise description of the proposed project as provided at the time of assessment, focusing on elements relevant to the VIA. The general project description may still be refined, and a more detailed description is provided in the EIA Report for the project. Unless changes to the project description affect aspects directly assessed in this VIA, they are not expected to affect the findings of this study.

### 3.1 Project Location

Bonsmara Solar PV (RF) (Pty) Ltd is proposing the construction of the 100MW Bonsmara PV Facility, BESS and associated infrastructure, ~12km south-east of Kroonstad, in the Free State Province (Figure 1-1). The facility will occupy a footprint of ~390 ha and will be located on Portion 0 of Farm 636 and Portion 1 of Farm 636 located in the Moqhaka Local Municipality, in the Fezile Dabi District Municipality.

The project is located over the following farm portions as detailed in Table 3-1 and Table 3-2 below.

Table 3-1: *Affected properties for the PV facility*

Farm Name	SG Code
Farm Scheveningen No. 636 Portion 0	F02000000000063600000
Farm Scheveningen No. 636 Portion 1	F02000000000063600001

Table 3-2: *Affected properties for the 132 kV powerline*

Farm Name	SG Code
Farm Scheveningen No. 636 Portion 0	F02000000000063600000
Farm Scheveningen No. 636 Portion 1	F02000000000063600001
Farm Oslaagte No. 2564 Portion 0	F02000000000256400000

This project is not located within one of the 11 designated Renewable Energy Development Zones (REDZ) in South Africa. The REDZ are geographically defined areas in which the South African Government has encouraged the development of PV and wind renewable energy projects by promulgating a streamlined authorisation approach. As such, the REDZ have become areas in which the development of PV projects is considered more acceptable, though sites outside REDZ are not precluded.

### 3.1.1 Location Alternatives

No other location alternatives are being considered. The site is located approximately 2 km from a grid connection point that has been confirmed to have sufficient capacity to evacuate the generated electricity. The land has been confirmed as available by private landowners. A prefeasibility study by an agricultural specialist found the site to be suitable in terms of agricultural sensitivity.

## 3.2 Project Description

The 100 MW PV Facility will comprise several arrays of PV panels, BESS and associated infrastructure. An on-site substation and a 2 km 132 kV powerline will evacuate the power to the grid.

Preliminary PV Facility components include:

- PV modules and mounting structures (monofacial or bifacial) with fixed, single or double axis tracking mounting structures;
- Associated stormwater management infrastructure;
- BESS;
- Site and internal access roads (up to 6 m wide);
- Temporary laydown area during the construction phase for the construction camp and laydown area (which will be a permanent laydown area for the BESS during the operational phase);
- Infrastructure including offices, operational control centre, operation and maintenance area, ablution facilities etc;
- Grid connection infrastructure including medium-voltage cabling between the project components and the facility substation (underground cabling will be used where practical (up to 33 kV));
- Perimeter fencing; and
- Rainwater and/or groundwater storage tanks and associated water transfer infrastructure.

The on-site 33 kV/132 kV substation (facility substation) will step up power from 33 kV to 132 kV for transmission to the national grid. The power will then be evacuated to the national grid by the proposed ~2 km 132 kV powerline that connects the on-site substation to the Kroonstad Switching Station. A 300 m powerline corridor was assessed (150 m on either side).

### 3.2.1 *Technology Alternatives*

No other activity alternatives are being considered. Concentrated Solar Power (CSP) technology has not been considered suitable for this site because it requires a flat surface, has a high visual impact and requires large volumes of water. In addition, CSP has not been catered for in the IRP2019.

A wind energy facility has not been considered as a technology alternative, as the climatic conditions show that wind resources in the area are not suitable.

### 3.2.2 *Layout Alternatives*

The design and layout alternatives will be considered and assessed as part of the EIA taking into consideration the environmental constraints identified by the specialists.

The BESS, laydown area and substation are optimally located in the south-east corner of the site closest to the grid connection point and access road. The powerline follows the shortest route to the grid connection point and follows an existing 132 kV powerline.

### 3.2.3 *No Go Alternative*

The 'no-go' alternative is the option of not undertaking the development of the proposed PV Facility and / or grid connection infrastructure. Hence, if the 'no-go' option is implemented, there would be no development. The 'no-go' option assumes that the site remains in its current state and the status quo would be preserved.

This alternative would result in no environmental impacts from the proposed project on the site or the surrounding local area. It provides the baseline against which other alternatives are compared and will be considered throughout the report.

## **4. LEGAL REQUIREMENTS AND GUIDELINES**

Relevant guidelines that provide direction for visual assessment include the Department of Environmental Affairs and Development Planning's (DEA&DP) "Guideline for Involving Visual and Aesthetic Specialists in EIA Processes" (DEA&DP, 2005) and the Landscape Institute's "Guidelines for Landscape and Visual Impact Assessments" (2013), which have been considered in this VIA.

DEA&DP's Guideline (2005) identifies typical components of a visual study:

- Identification of issues and values relating to visual, aesthetic and scenic resources through involvement of stakeholders;
- Identification of landscape types, landscape character and sense of place, generally based on geology, landforms, vegetation cover and land use patterns;
- Identification of viewsheds, view catchment area and the zone of visual influence, generally based on topography;
- Identification of important viewpoints and view corridors within the affected environment, including sensitive receptors;
- Indication of distance radii from the proposed project to the various viewpoints and receptors;

- Determination of the VAC of the landscape, usually based on topography, vegetation cover or urban fabric in the area;
- Determination of the relative visibility, or visual intrusion, of the proposed project;
- Determination of the relative compatibility or conflict of the project with the surroundings; and
- A comparison of the existing situation with the probable effect of the proposed project.

Projects that warrant a visual specialist study include those:

- Located in a receiving environment with:
  - Protection status, such as national parks or nature reserves;
  - Proclaimed heritage sites or scenic routes;
  - Intact wilderness qualities, or pristine ecosystems;
  - Intact or outstanding rural or townscape qualities;
  - A recognized special character or sense of place;
- Outside a defined urban edge line;
- Sites of cultural or religious significance;
- Important tourism or recreation value;
- Important vistas or scenic corridors;
- Visually prominent ridgelines or skylines; and/or
- Where the project is:
  - High intensity, including large-scale infrastructure;
  - A change in land use from the prevailing use;
  - In conflict with an adopted plan or vision;
  - A significant change to the fabric and character of the area;
  - A significant change to the townscape or streetscape;
  - A possible visual intrusion in the landscape; or
  - Obstructing views of others in the area.

In terms of the guideline, the proposed PV Facility and associated infrastructure can be classified as a Category 5 development, which includes powerlines and large-scale infrastructure. As the project is situated in an area of medium scenic, cultural, and historical significance, a high visual impact is expected (see Table 4-1), since the project introduces:

- Potential intrusion on protected landscapes or scenic resources;
- Noticeable change in the visual character of the area; and
- Establishes a new precedent for development in the area.

Such a project typically warrants a Level 4 assessment (see Table 4-2), which includes the following generic steps:

- Identification of issues and site visit;



- Description of receiving environment and proposed project;
- Establishment of view catchment area, view corridors, viewpoints and receptors;
- Indication of potential visual impacts using established criteria;
- Inclusion of potential lighting impacts at night;
- Description of alternatives, mitigation measures and monitoring programmes; and
- Completion of 3D modelling and simulations, with and without mitigation.

Table 4-1: Expected visual impact significance

Type of environment	Type of development				
	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5
Protected / wild areas	Moderate	High	High	Very high	Very high
High scenic, cultural, historical value	Minimal	Moderate	High	High	Very high
Medium scenic, cultural, historical value	Little or none	Minimal	Moderate	High	High
Low scenic, cultural, historical value / disturbed	Little or none Possible benefits	Little or none	Minimal	Moderate	High
Disturbed or degraded sites	Little or none Possible benefits	Little or none Possible benefits	Little or none	Minimal	Moderate

Table 4-2: Recommended approach for visual assessment

Approach	Type of issue expected				
	Little or no visual impact	Minimal visual impact	Moderate visual impact	High visual impact	Very high visual impact
Level of visual impact recommended	Level 1 visual input	Level 2 visual input	Level 3 visual assessment	Level 4 visual assessment	

## 5. DESCRIPTION OF THE RECEIVING ENVIRONMENT – VISUAL CONTEXT

The following description of the affected environment focuses on the Visual Character of the area surrounding and including the project (the study area) and discusses the Visual Quality and Sense of Place<sup>2</sup>. This baseline information provides the context for the visual analysis.

### 5.1 Landscape Character

Landscape character is the description of the pattern of the landscape, resulting from particular combinations of natural (physical and biological) and cultural (land use) characteristics. It focuses on the inherent nature of the land rather than the response of a viewer (Young, 2000).

<sup>2</sup> These terms are explained in the relevant sections below.

### 5.1.1 Geology and Topography

The geology and topography of the area, together with the temperate climate, provide the framework for the basic landscape features and visual elements of the study area.

The site is located on a relatively flat portion of land, on the crest of a hill, in an undulating landscape between the Blomspruit and Vals Rivers (Figure 5-2). The ~ 600 ha site gently slopes from ~1450 m above mean sea level (mamsl) in the south-west of the site to ~1371 mamsl in the north-east.

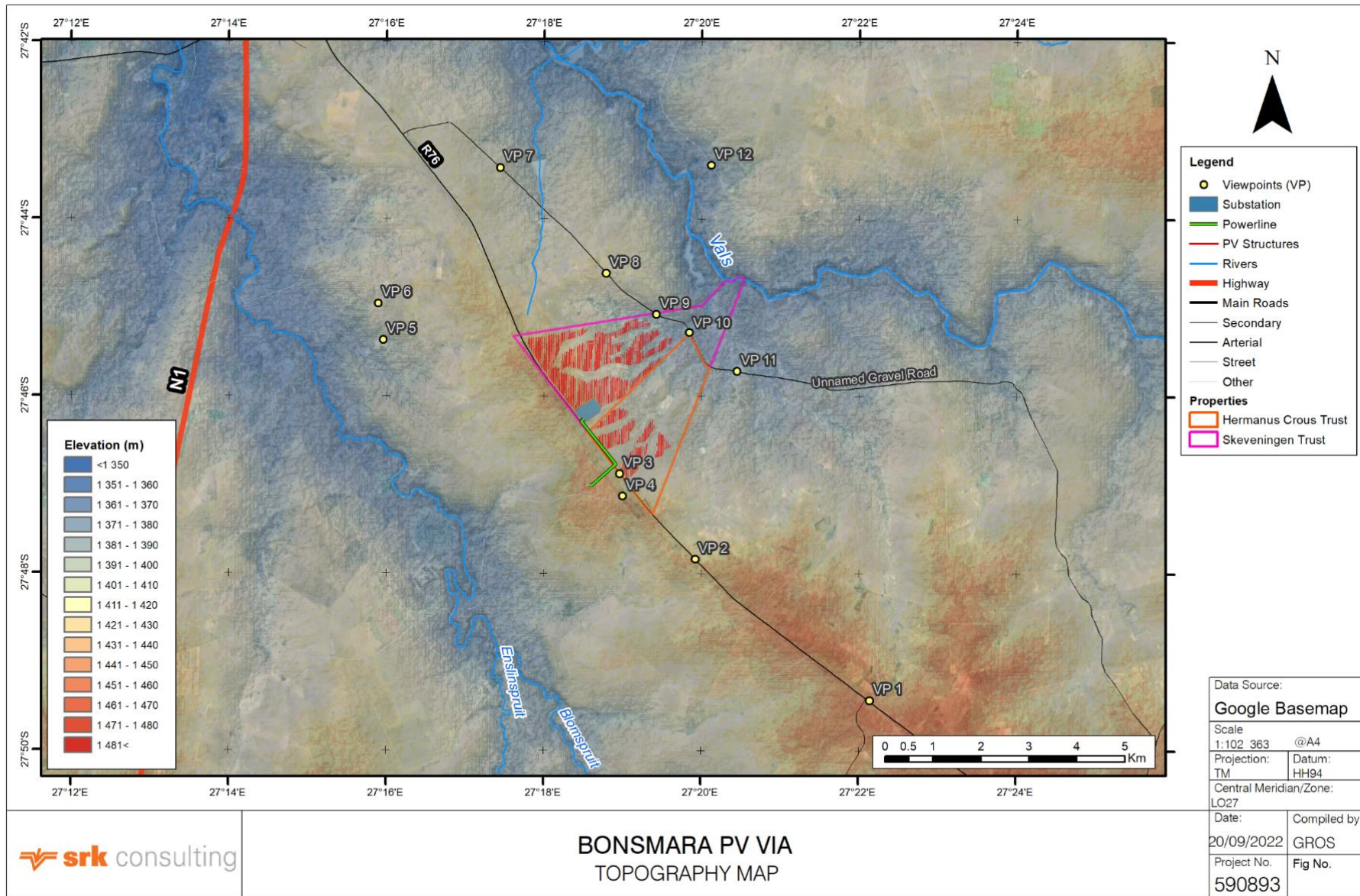
The project is underlain by the sandstones of the Normadien Formation, of the Beaufort Group.

### 5.1.2 Vegetation

The project is located within the original extent of the Central Free State Grassland, one of the vegetation types that dominates the Dry Highveld Grassland Biome spatially. The Dry Highland Grassland Biome occurs at mid-altitudes of 1 300 – 1 600 mamsl, characterised by undulating topography with small rocky outcrops and river valleys. The biome comprises grasses (veld) and low shrubby vegetation with small clusters of trees and bushes, partially reminiscent of African savannah landscapes (Figure 5-1).



Figure 5-1: Vegetation in the project area. Photo taken at Viewpoint (VP) 4 looking toward the project site.



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Figure 5-2: Topography map



### 5.1.3 Land Use

The highveld is home to some of South Africa's most important commercial farming areas, as well as its largest concentration of metropolitan centres. Kroonstad, located ~ 12 km north-west of the site, is the third largest city in the Free State Province. The Free State Province's key economic sectors include agriculture and mining activities, with the province producing over 70% of South Africa's grain.

The area surrounding the site is predominantly characterised by agricultural activities, small urban centres, infrastructure (roads and rail) and natural highveld grassland. Agriculture, mainly crop and cattle farming, is the predominant land use surrounding the site, with farmsteads interspersed throughout the area. National, regional and provincial roads criss-cross the region, converging in Kroonstad. A railway line runs parallel to the R76 (regional road) to the south-west of the site. An existing 132 kV powerline traverses the site in a northeasterly – southwesterly direction (Figure 5-4).

The site is located adjacent to the R76 road connecting the towns of Kroonstad and Steynrus. Surrounding land use includes:

- Agricultural activities including livestock farming (cattle and sheep (Figure 5-3));
- Farmsteads;
- Electrical grid infrastructure including a substation and powerlines (Figure 5-4);
- Serfontein Dam;
- Bossiespruit Military Base;
- Bossiespruit Shooting Range; and
- Kroonstad Airport.



Figure 5-3: Agricultural land to the east of the site. Photo taken at VP11 looking toward the project site.



Figure 5-4: Existing 132 kV powerline extending across the site and over the R76. Photo taken at VP3 looking toward the project.

The two farms that constitute the project site are undeveloped, covered in grasslands and small clusters of trees and used for grazing.

## 5.2 Visual Character

Visual character is descriptive and non-evaluative, which implies that it is based on defined attributes that are neither positive nor negative. It refers to the overall experience and impression of the landscape, such as natural or transformed.

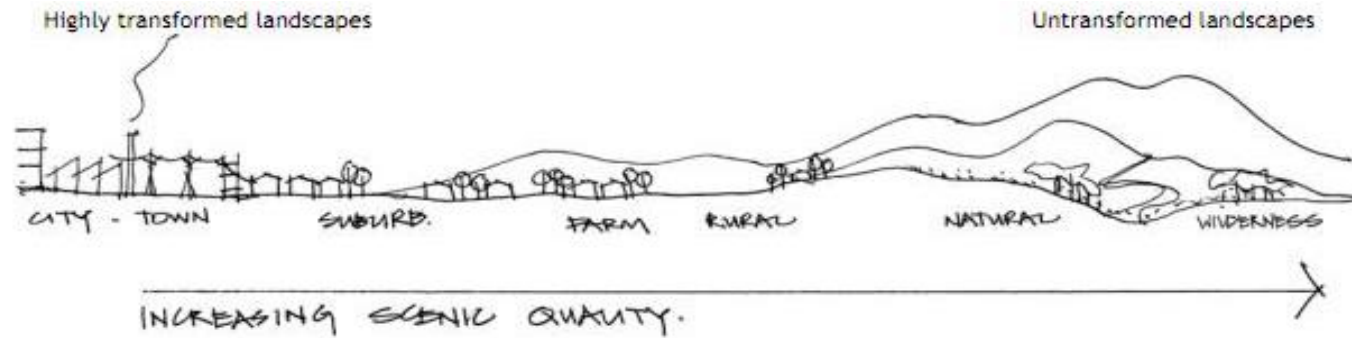
A change in visual character cannot be described as having positive or negative attributes until the viewer's response to that change has been taken into consideration. The probable change caused by the project is assessed against the existing degree of change caused by previous development.

The basis for the visual character is provided by the topography, vegetation and land use of the area, which is a predominantly rural environment characterised by the undulating, vegetated landscape, albeit with pockets of settlements and regional and national roads routed through the surrounding area. The rolling expanse of vegetated landscape surrounding the site evokes a rural, undeveloped environment. The project area can therefore be defined as a modified rural landscape as it is mostly rural but settlements, powerlines and roads and railway are visible in the landscape (Figure 5-5 and Figure 5-6).



Figure 5-5: Modified rural landscape

Highly Transformed Landscape – Urban/Industrial	Transition Landscape	Modified Rural Landscape	Natural Transition Landscape	Untransformed Landscape – Natural
Substantially developed landscape. High levels of visual impact associated with buildings, factories, roads and other related infrastructure (e.g. powerlines).	Transitional landscape associated with the interface between, rural, agricultural area and more developed suburban or urban zones.	Typical character is rural landscape, defined by field patterns, forestry plantations and agricultural areas and associated small-scale roads and buildings.	A changing landscape character associated with the interface between natural areas and modified rural / pastoral or agricultural zones.	No / minimal impact associated with the actions of man. National parks, coastlines, pristine forest areas.



Source: (CNDV, 2006)



(Shan Ding Lu, 2009)



(Night Jar Travel South Africa, 2012)



(Boschkloof, 2012)

Figure 5-6: Typical visual character attributes

### 5.3 Visual Quality

Aesthetic value is an emotional response derived from our experience and perceptions. As such, it is subjective and difficult to quantify in absolute terms. Studies in perceptual psychology have shown that humans prefer landscapes with higher complexity (Crawford, 1994). Landscape quality can be said to increase when:

- Topographic ruggedness and relative relief increases;
- Water forms are present;
- Diverse patterns of grasslands, shrubs and trees occur;
- Natural landscape increases and man-made landscape decreases; and
- Where land use compatibility increases.

The visual quality of the area can be experienced through rolling views of the gentle hills in the landscape, especially from and across the site (Figure 5-7). The study area is defined by the fabric of the agricultural grazing activity taking place in the area. The naturally undulating landscape is intermittently interrupted by powerlines and railway lines which detract from the visual quality of the surrounding area. The streams, rivers and dams in the area add to the somewhat unspectacular visual quality.

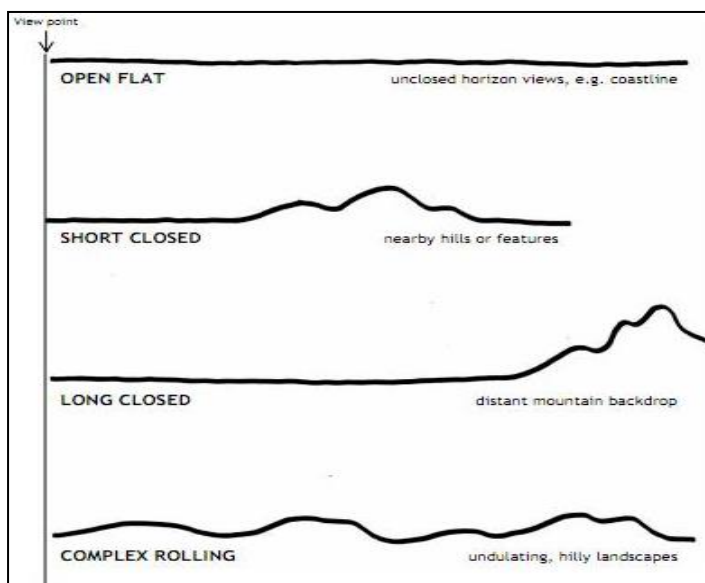


Figure 5-7: Typical views in the landscape

Sources: (CNDV, 2006)





Figure 5-8: Rolling views of the undulating landscape. Photo taken from VP 8 looking toward the project site.

## 5.4 Visual Receptors

Visual receptors have been identified based on surrounding land uses, including the residential and recreational areas (see Section 5.1.3). The visual receptors are briefly described below and linked to viewpoints (VP) indicated in Table 6-4 and Figure 6-3:

- Surrounding Residents (VP 1, VP 4 - VP 7, VP 11 - VP 12): Isolated farmsteads are interspersed throughout the area surrounding the PV Facility in all directions.
- Railway Passengers and Personnel (VP 1 and VP 4): A railway line extends parallel to the R76 to the south-west of the site.
- Motorists (VP 2 - VP 3, VP 6 - VP 12): Two roads are located in close proximity to the project site; the R76 and the Unnamed Gravel Road. The south-western boundary of the site directly abuts the tarred R76<sup>3</sup>, which extends in a north-westerly to south-easterly direction, connecting Kroonstad and Steynrus. The Unnamed Gravel Road branches off from the R76 to the north of the site, then extends in a south-easterly direction, and borders the site to the north-east.

The Serfontein Dam, Bossiespruit Shooting Range and Military Base and Kroonstad Airport were identified within ~10 km from the site. However, the viewshed (Figure 6-1), topographical map (Figure 5-2) and site verification, indicate that receptors at these locations will not have a view of the proposed facility and therefore are not considered to be visual receptors, nor considered further in this VIA.

## 5.5 Sense of Place

Our sense of a place depends not only on spatial form and quality, but also on culture, temperament, status, experience and the current purpose of the observer (Lynch, 1992). Central to the idea of 'sense of place' or *genius loci* is identity. An area will have a stronger sense of place if it can easily be identified, that is to say if it is unique and distinct from other places. Lynch defines 'sense of place' as "the extent to which a person can recognise or recall a place as being distinct from other places – as having a vivid or unique, or at least a particular, character of its own" (Lynch, 1992).

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<sup>3</sup> At the time of the site visit, the R76 was being re-sealed.



It is often the case that sense of place is linked directly to visual quality and that areas / spaces with high visual quality have a strong sense of place. However, this is not an inviolate relationship and it is plausible that areas of low visual quality may have a strong sense of place or – more commonly – that areas of high visual quality have a weak sense of place. The defining feature of sense of place is uniqueness, generally real or biophysical (e.g. trees in an otherwise treeless expanse), but sometimes perceived (e.g. visible but unspectacular sacred sites and places which evoke defined responses in receptors). In this context Cross (2001) identified six categories of relationships with place: biographical, spiritual, ideological, narrative, cognitive and dependent (Table 5-1).

The region has scenic value in terms of its undulating natural landscape and the views over large portions of agricultural land. The natural landscape and rustic character contrast with the anthropogenic influence in the region, viz. urban development, albeit, some 12 km away.

Table 5-1: Relationship to place

Type of Relationship	Process
Biographical (historical and familial)	Being born in and living in a place. Develops over time
Spiritual (emotional, intangible)	Feeling a sense of belonging
Ideological (moral and ethical)	Living according to moral guidelines for human responsibility to place Guidelines may be religious or secular
Narrative (mythical)	Learning about a place through stories, family histories, political accounts and fictional accounts
Cognitive (based on choice and desirability)	Choosing a place based on a list of desirable traits and lifestyle preferences
Dependent (material)	Constrained by lack of choice, dependency on another person or economic opportunity

Sources: Adapted from Cross (2001)

The sense of place of the surrounding area is strongly influenced by the surrounding land use, which can generally be described as a rural agricultural area. The sense of place is not particularly distinct from the rest of the wider region and is not overly memorable.

The relationship of receptors in the study area (Section 5.4) to place may be predominantly biographical and dependent. A family, for example, whose has farmed in this area for a few generations will have a biographical and dependent attachment to the area.

## 6. ANALYSIS OF THE MAGNITUDE OF THE VISUAL IMPACT

The following section outlines the analysis that was undertaken to determine the **magnitude or intensity** of the overall visual impact resulting from the project. Various factors were considered in the assessment, including:

- Visual exposure;
- Visual absorption capacity;
- Sensitivity of visual receptors;
- Visibility and viewing distance; and

- Integrity with existing landscape / townscape.

The analysis of the magnitude or intensity of the visual impact, as described in this section, is summarized and integrated in Table 6-6 and forms the basis for the assessment and rating of the impact as documented in Section 6.

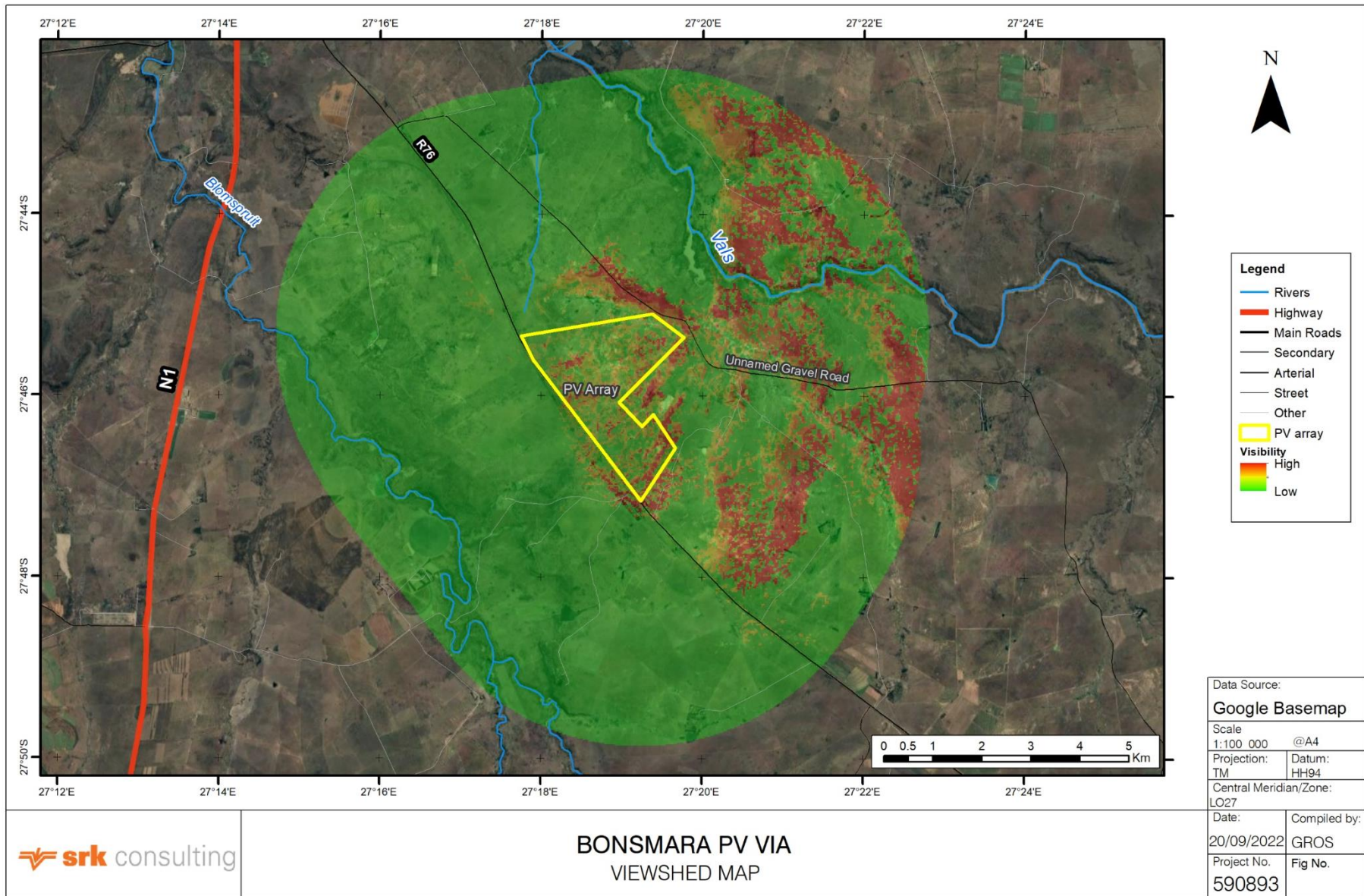
## 6.1 Visual Exposure

Visual exposure is determined by the zone of visual influence or viewshed. The viewshed is the topographically defined area that includes all the major observation sites from which the project *could* be visible. The viewshed analysis assumes maximum visibility of the project in an environment stripped bare of vegetation and structures. The viewshed indicates the visibility of the project, accounting for the decrease in visibility as distance from the project increases (Figure 6-1).

It is anticipated that visibility of the PV array will be moderate due to the size and nature of the project (i.e. a large ~390 ha reflective PV array located in a rural area). It is anticipated that the BESS and on-site substation will be visible to receptors to the north-west, south-east and west of the site due to the location of this infrastructure along the south-western boundary of the site. The smaller dimensions of these components are expected to limit their visibility from across the site to the north. The visual exposure of the proposed ~2 km powerline is limited due its short length (~2 km). Furthermore, existing powerlines within close proximity to the proposed powerline route are expected to have inured receptors to powerlines within the landscape.

The viewshed analysis shows the proposed PV array will be highly visible from the few elevated areas to the north-east, east and south-east of the site. Few of the isolated farmsteads surrounding the site are located within areas identified as having visibility of the site (Figure 6-4). Motorists on the R76 will have a view of the project when travelling adjacent to the south-western boundary of the site, however beyond this portion of the R76 motorists will have limited visibility of the project.

The visual exposure of proposed infrastructure is thus deemed ***moderate***.



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Figure 6-1: Viewshed

## 6.2 Visual Absorption Capacity

The VAC is the potential for an area to conceal and assimilate the proposed project. Criteria used to determine the VAC of the affected area are defined in Table 6-1. The VAC of an area is increased by:

1. Topography and vegetation that is able to provide screening and increase the VAC of a landscape;
2. The degree of urbanisation compared to open space. A highly urbanised landscape is better able to absorb the visual impacts of similar developments, whereas an undeveloped rural landscape will have a lower VAC; and
3. The scale and density of surrounding development.

These factors frequently apply at different scales, by influencing the VAC in the foreground (e.g. dense bush, existing roads and bridges, small structures), middleground and background (e.g. tall forests, hills, cityscapes).







Generally rural areas have a lower VAC, however the VAC of the project area is marginally increased by undulating topography and - to a far more limited extent - by grassland (veld) and small clusters of trees, providing screening to the project. The low vertical profile of the PV panels is anticipated to increase the screening potential of the vegetation and topography. However, vegetation is not able to provide screening to the associated infrastructure such as the substation and pylons (associated with the powerline). The undulating topography will marginally absorb the associated infrastructure.

Urban development can help to increase VAC, but is some distance from the project site, reducing this effect. In addition, the large ~390 ha footprint of the PV array also reduces the VAC.

The study area has a **low** VAC for the PV Facility and a **moderate** VAC for the proposed powerline.



Table 6-1: Visual absorption capacity criteria

High	Moderate	Low
<p>The area is able to absorb the visual impact as it has:</p> <ul style="list-style-type: none"> <li>■ Undulating topography and relief</li> <li>■ Good screening vegetation (high and dense)</li> <li>■ Is highly urbanised in character (existing development is of a scale and density to absorb the visual impact).</li> </ul>	<p>The area is moderately able to absorb the visual impact, as it has:</p> <ul style="list-style-type: none"> <li>■ Moderately undulating topography and relief</li> <li>■ Some or partial screening vegetation</li> <li>■ A relatively urbanised character (existing development is of a scale and density to absorb the visual impact to some extent).</li> </ul>	<p>The area is not able to absorb the visual impact as it has:</p> <ul style="list-style-type: none"> <li>■ Flat topography</li> <li>■ Low growing or sparse vegetation</li> <li>■ Is not urbanised (existing development is not of a scale and density to absorb the visual impact to some extent.)</li> </ul>
 <p><a href="http://www.franschoek.co.za">http://www.franschoek.co.za</a></p>	 <p><a href="http://wikipedia.org">http://wikipedia.org</a></p>	 <p><a href="http://www.butbn.cas.cz">http://www.butbn.cas.cz</a></p>
 <p><a href="http://commons.wikimedia.org">http://commons.wikimedia.org</a></p>	 <p><a href="http://blogs.agu.org">http://blogs.agu.org</a></p>	 <p><a href="http://fortheinterim.com">http://fortheinterim.com</a></p>

### 6.3 Sensitivity of Visual Receptors

Receptors are important insofar as they inform visual sensitivity. The sensitivity of viewers is determined by the number and nature of viewers.

Viewers can be deemed to have:

1. High sensitivity if they view the project from e.g. residential areas, nature reserves and scenic routes or trails;
2. Moderate sensitivity if they view the project from e.g. sporting or recreational areas or places of work; and
3. Low sensitivity if they view the project from or within e.g. industrial, mining or degraded areas, or are transient viewers on roads.

The sensitivity of potential viewers identified in Section 5.4 is described below:

- **Surrounding Residents:** Residents of the surrounding farmsteads are considered to have sensitivities ranging from low to medium depending on the proximity to the project site. Residents located more than 1km away from the site are anticipated to view the site in the background.
- **Railway passengers and personnel:** Passengers and personnel travelling by rail are anticipated to have a view of the site from certain sections of the railway route where screening by vegetation and topography does not exist. Railway passengers and personnel are considered to have relatively low sensitivity as their views of the project are transient (fleeting) and temporary.
- **Motorists:** Two roads are located in close proximity to the project site (Figure 1-1). The R76 extends in a north-westerly and south-easterly direction and is directly adjacent to the ~4 km long south-western boundary of the site. The R76 connects Kroonstad and Steynrus. Gravel roads branch off the R76 and lead to farms set back from the R76. The Unnamed Gravel Road connecting to the R76 to the north of the site, abuts to the north-eastern boundary of the site. This gravel road leads to various farms located between the R76, to the south, and the Vals River to the north (Figure 1-1).

Motorists are considered to have relatively low sensitivity as their view of the project is fleeting and temporary.

The sensitivity of the visual receptors potentially affected by the visual impact of the project is considered to be **moderate** due to the distance from farmsteads, and proximity to roads and rail infrastructure. It is anticipated that the visual receptors will be more sensitive to the PV array, on-site substation and BESS than the proposed powerline due to the (familiarity with) existing powerlines in the landscape.

### 6.4 Viewing Distance and Visibility

The distance of a viewer from an object is an important determinant of the magnitude of the visual impact. This is because the visual impact of an object diminishes / attenuates as the distance between the viewer and the object increases. Thus, the visual impact at 1 000 m would, nominally, be 25% of the impact as viewed from 500 m. At 2 000 m it would be 10% of the impact at 500 m (Hull and Bishop, 1988 in (Young, 2000)).

Three basic distance categories can be defined for a project of this scale (as discussed and represented in Table 6-2): foreground, middleground and background.

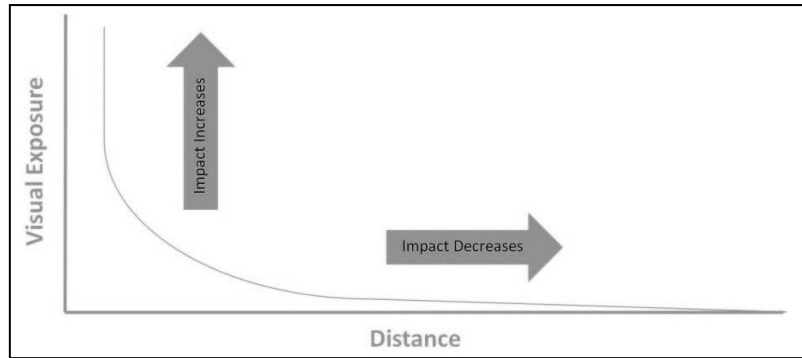


Figure 6-2: Visual exposure vis-à-vis distance

Sources: Adapted from Hull and Bishop, 2998 in (Young, 2000)

Table 6-2: Distance categories

<b>FOREGROUND (0 – 2 km)</b>	The zone where the proposed project will dominate the frame of view. The project will be <i>highly visible</i> unless obscured.
<b>MIDDLEGROUND (2 - 5 km)</b>	The zone where colour and line are still readily discernible. The project will be <i>moderately visible</i> but will still be easily recognisable.
<b>BACKGROUND (5 -10 km)</b>	This zone stretches from 2 km to 5 km. Objects in this zone can be classified as <i>marginally visible</i> to <i>not visible</i> .

A number of viewpoints were selected to indicate locations from where receptors may (or may not) view the project. The viewpoints are shown in Figure 6-3 and listed in Table 6-4. Current views from these points are shown in Appendix C.

The predicted visibility of (any element of the project) from each viewpoint is described in Table 6-4, based on visibility and the distance categories in Table 6-2. Note that unlike visual exposure (Section 6.1) which describes areas from which the project may be visible without taking local screening into account (i.e. the viewshed), visibility describes predicted, actual visibility. The visibility of the project can be summarised as follows:

- The project will be highly visible in the foreground to motorists travelling to the east and west of the site (VP 3, VP 9, VP 10);
- The project will be partially screened to motorists and railway passengers travelling to the west and south-east of the site by an vegetation; and
- The project will marginally visible / not visible to surrounding residents largely due to topography screening the site and distance from the site.

Overall, the visibility of the project is **moderate** due to the number of receptors in the foreground and middleground, albeit transient and temporary receptors.

Table 6-3: Visibility criteria

<b>NOT VISIBLE</b>	Project cannot be seen	
<b>MARGINALLY VISIBLE</b>	Project is only just visible / partially visible (usually in the background zone)	
<b>VISIBLE</b>	Project is visible although parts may be partially obscured (usually in middleground zone)	
<b>HIGHLY VISIBLE</b>	Project is clearly visible (usually in foreground or middleground zone)	



Table 6-4: Visibility from viewpoints

Viewpoint #	Location	Co-ordinates	Direction of view	Potential Receptors	Visibility
VP 1	Dennehof Farm	27° 49' 25.79"S 27° 22' 8.58"E	Looking north-west	Farmsteads on Dennehof Farm and motorists on R76.	<b>Not Visible</b> The site is visible from the farmstead and R76 due to the undulating topography.
VP 2	R76 south	27° 47' 50.49"S 27° 19' 55.40"E	Looking north	Motorists on R76.	<b>Marginally Visible</b> The site is screened by tall, mature trees, limiting visibility of the site in the background from this VP.
VP 3	R76 Bonsmara	27° 46' 52.61"S 27° 18' 57.81"E	Looking north-east	Motorists on R76.	<b>Highly Visible</b> The site is visible to motorists in the foreground.
VP 4	Patrijsdraai Farm	27° 47' 7.95"S 27° 18' 59.98"E	Looking north-east	Residents of farms to the west of the R76, e.g. Patrijsdraai and individuals travelling on the railway.	<b>Visible</b> The site is visible to motorists travelling to and from the farmsteads to the west and receptors travelling by train. The project will not be visible to the residents to the west of the site as they are located at a lower elevation than the site.
VP 5	Farmstead 1	27° 45' 22.08"S 27° 15' 57.63"E	Looking south-east	Residents of Farmstead.	<b>Not Visible</b> The site is not visible to the residents of this farmstead as it is located at a lower elevation than the site.
VP 6	Lan Crest	27° 44' 57.43"S 27° 15' 53.72"E	Looking south- east	Residents of Lan Crest and motorists.	<b>Not Visible</b> The site is not visible to the residents or motorists as the farmstead and road are located at a lower elevation than the site
VP 7	Farmstead 2	27° 43' 25.46"S 27° 17' 26.58"E	Looking south	Motorists travelling on the gravel road and residents of the farmstead in close proximity to VP 7.	<b>Not Visible</b> The site is not visible to the farmstead due to screening provided by the topography.
VP 8	Unnamed Gravel Road	27° 44' 36.89"S 27° 18' 47.25"E	Looking south	Motorists on unnamed gravel road.	<b>Visible</b> The site is visible to the motorists in the background.
VP 9	Unnamed Gravel Road	27° 45' 4.81"S 27° 19' 25.68"E	Looking south-west	Motorists on unnamed gravel road	<b>Highly Visible</b> The site is visible to the motorists in the foreground.
VP 10	Unnamed Gravel Road	27° 45' 16.95"S 27° 19' 50.77"E	Looking west	Motorists on unnamed gravel road.	<b>Highly Visible</b> The site is visible to the motorists in the middleground.

Viewpoint #	Location	Co-ordinates	Direction of view	Potential Receptors	Visibility
VP 11	Farmstead 3	27° 45' 43.29"S 27° 20' 27.21"E	Looking west	Residents of the farmstead and motorists on unnamed gravel road.	<b>Marginally Visible</b> The site will be marginally visible to the motorists in the background.
VP 12	Farmstead 4	27° 43' 23.84"S 27° 20' 7.01"E	Looking south-west	Residents of farmstead and motorists.	<b>Not Visible</b> The site is not visible to the farmstead and motorists due to screening provided by the topography.

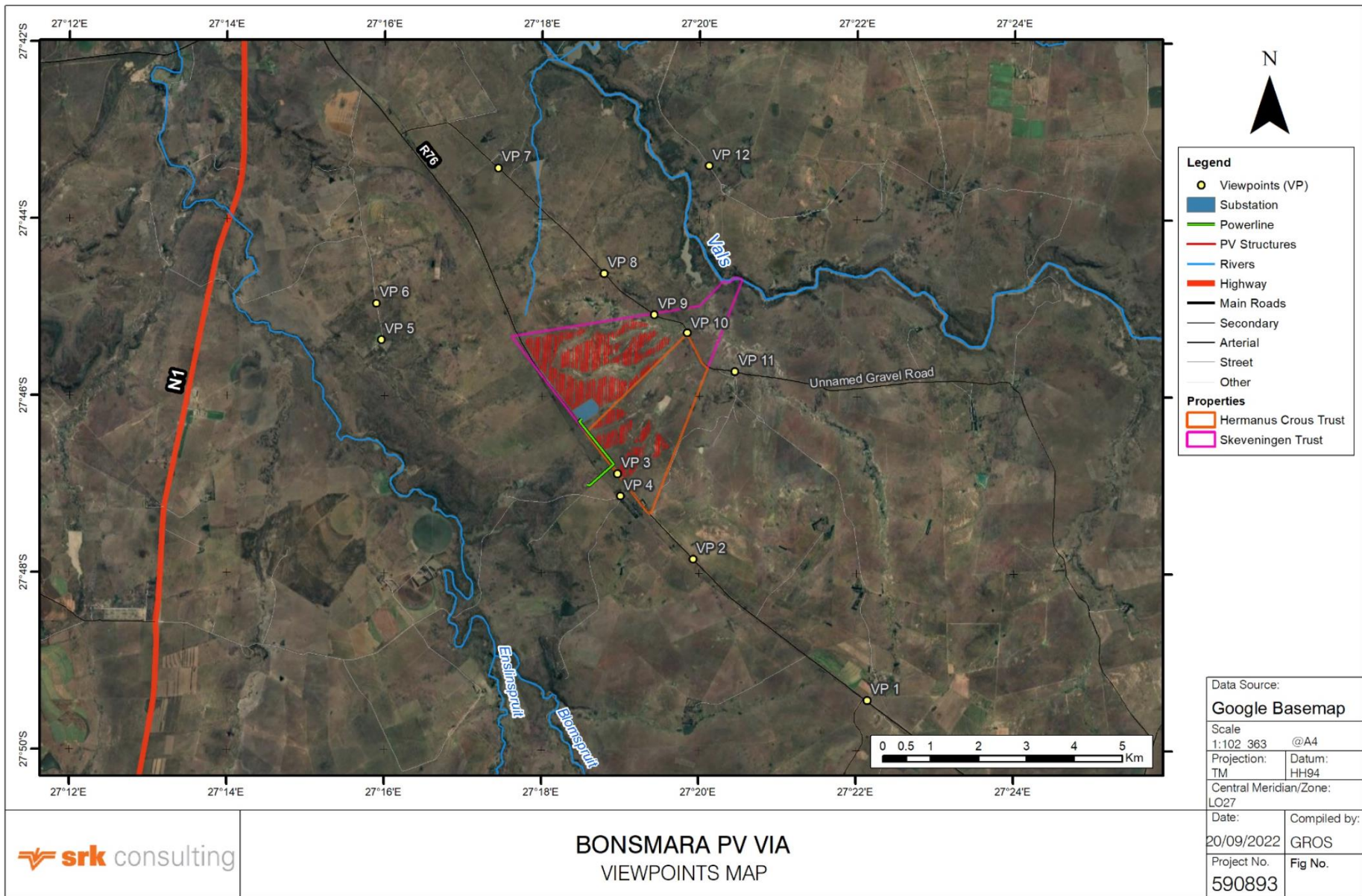


Figure 6-3: Viewpoints



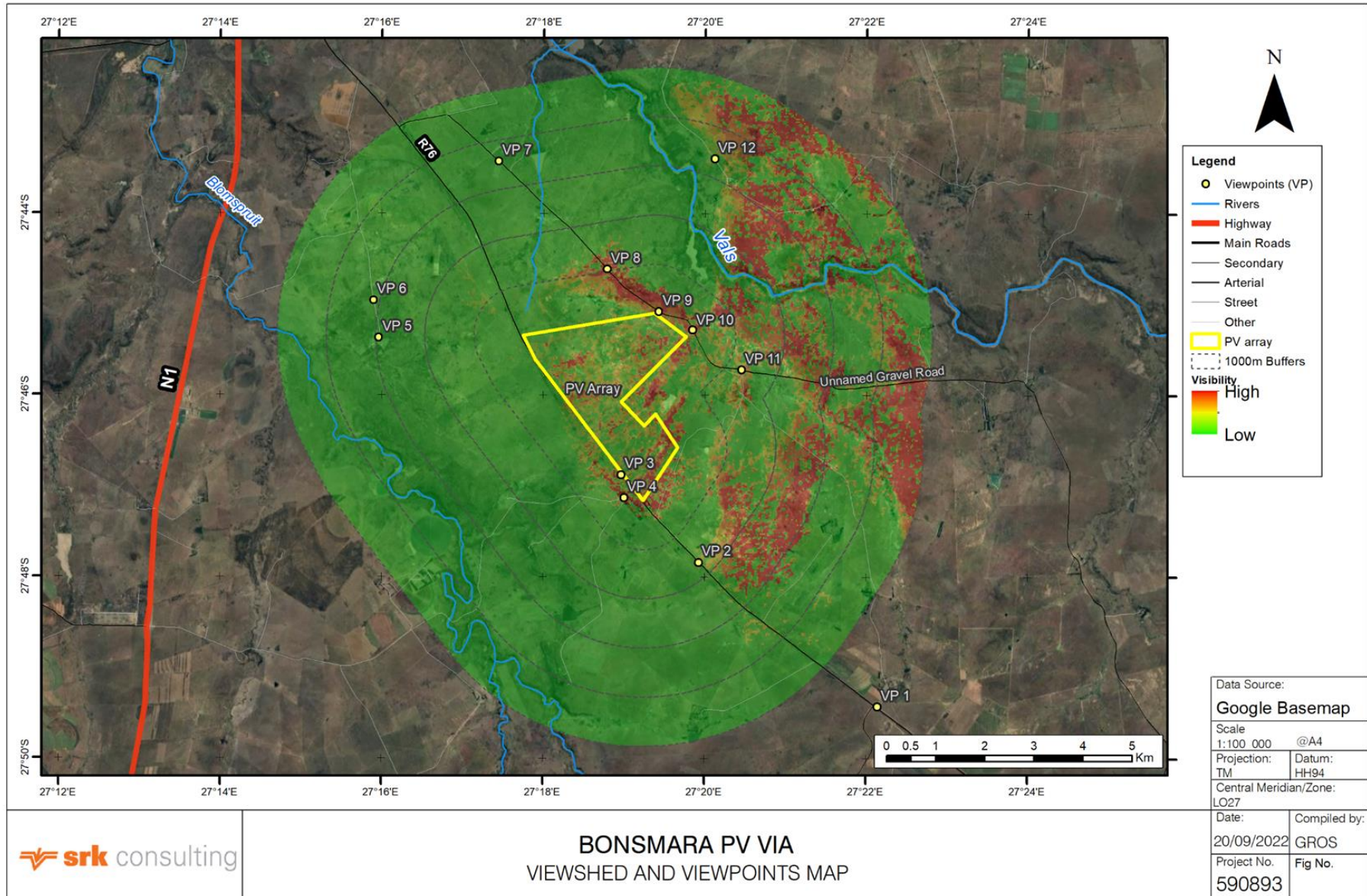


Figure 6-4: Viewshed and viewpoints

## 6.5 Compatibility with Landscape Integrity

Landscape (or townscape) integrity refers to the compatibility of the development / visual intrusion with the existing landscape. The landscape integrity of the project is rated based on the relevant criteria listed in Table 6-5.

Table 6-5: *Landscape integrity criteria*

Criterion	Landscape integrity		
	High	Moderate	Low
	The project is:		
Consistency with existing land use of the area	Consistent	Moderately consistent	Not consistent / very different
Sensitivity to natural environment	Highly sensitive	Moderately sensitive	Not sensitive
Consistency with urban texture and layout	Consistent	Moderately consistent	Not consistent / very different
Congruence of buildings / structures with / sensitivity to existing architecture / buildings	Congruent / sensitive	Moderately congruent / sensitive	Not congruent / sensitive
Scale and size relative to nearby existing development	Similar	Moderately similar	Different

The proposed project is located within a rural, agricultural area with sprawling grasslands surrounding the proposed project site. A railway line extends parallel to the R76, directly adjacent to the south-western boundary of the site. Existing powerlines, of varied sizes, criss-cross the area surrounding the site, and a substation is located adjacent to the R76 ~ 3 km to the south of the site.

The proposed PV array will introduce a large, uniform, reflective facility into the area and will be discordant with the current land use, scale and texture of the surrounding area. The BESS will also introduce a novel structure into the landscape that is different and incongruent to the type, size and scale of the existing land use and development in the area. However, the on-site substation and proposed 132 kV powerline will be moderately consistent and congruent with the use, texture, size and form of existing infrastructure and land use surrounding the site.

The project is deemed to have **low** integrity with the surrounding landscape.

## 6.6 Magnitude of the Overall Visual Impact

Based on the above criteria, the magnitude or intensity of the overall visual impact that is expected to result from the project has been rated. Table 6-6 provides a summary of the criteria, a descriptor summarising the status of the criteria and projected impact magnitude ratings.

The overall magnitude of the visual impact that is expected to result from the project is rated as **moderate**. The moderate visual exposure, low compatibility with landscape integrity and low VAC (for the PV Facility) are moderated by the moderate viewer sensitivity and viewing distance, with the project largely screened by vegetation and / or landscape to residents of the surrounding farmsteads.

Table 6-6: Magnitude of overall visual impact

Criteria	Rating	Comments
Visual Exposure (Viewshed)	Moderate	The project area will be highly visible from the few elevated areas to the north-east, east and south-east of the site. Few of the isolated farmsteads surrounding the site are located within areas identified as having visibility of the site. Motorists on the R76 will have a view of the site when travelling adjacent to the south-western boundary of the site, however beyond this portion of the R76 motorists will have limited visibility.
Visual Absorption Capacity	Low (PV Facility) and Moderate (Powerline)	The VAC of the area is marginally increased by the undulating topography, and - to far more limited extent - by the grassland (veld) and small clusters of trees, providing screening to the project. The low vertical profile of the PV panels is anticipated to increase the screening potential of the vegetation and topography. However, the vegetation is not able to provide screening to the associated infrastructure such as the substation and pylons. The undulating topography will marginally absorb the associated infrastructure.
Viewer Sensitivity (Receptors)	Moderate	Due to the distance of the project from farmsteads (moderately sensitive receptors) and the proximity to roads and rail infrastructure, the viewer sensitivity is considered moderate. It is anticipated that the visual receptors will be more sensitive to the PV array, on-site substation and BESS than the proposed powerline due to the (familiarity with) existing powerlines in the landscape.
Viewing Distance and Visibility	Moderate	A number of receptors in the foreground and middleground are affected.
Landscape Integrity	Low	The proposed PV array will introduce a large, uniform, reflective facility into the area and will be discordant with the current land use, scale and texture of the surrounding area. The BESS will also introduce a novel structure into the landscape that is different and incongruent to the type, size and scale of the existing land use and development in the area. The on-site substation and proposed 132 kV powerline will be moderately consistent and congruent with the use, texture, size and form of existing infrastructure and land use surrounding the site.

## 7. SPECIALIST FINDINGS / IDENTIFICATION AND ASSESSMENT OF IMPACTS

The following section describes the potential visual impacts during the construction and operational phases, and assesses the significance of these impacts utilising the impact rating methodology presented in Appendix B.

Possible measures to avoid, mitigate or compensate visual impacts are considered and recommended, depending on the severity of impacts and the feasibility of measures. The mitigation hierarchy and generic, guideline measures are provided below (DEA&DP, 2005):

- Avoid, e.g. by re-examining the need for the proposed project, relocating the project or re-designing the project;
- Mitigate (reduce), e.g. through adjustments to the siting and design of the project, careful selection of finishes and colours, use of earthworks (such as berms) and planting to provide visual screening and dust control where required;
- Rehabilitate and restore, e.g. through on-site and off-site landscape rehabilitation of areas affected by the project, which may include re-instating landforms and natural vegetation, provision of landscaped open space etc.;
- Compensate and offset, where avoidance or mitigation cannot achieve the desired effect; and
- Enhance, where the proposed project is located in run-down areas or degraded landscapes.

The project relates to the greenfield development of a PV Facility and associated infrastructure (i.e. powerline, on-site substation and BESS) and the potential visual impacts are more extensive than they would be for a brownfield project.

Direct visual and aesthetic impacts are likely to result from the following project interventions and/or activities:

- Earthworks and construction activities (including clearing of vegetation and associated generation of dust);
- Altered sense of place caused by the project;
- Visual intrusion diminishing vistas across the project area; and
- Increased light pollution.

The visual and aesthetic impacts generated by the project are likely to be associated with visual intrusion and visual quality.

Impacts of the PV Facility components<sup>4</sup> and the grid connection component (132 kV powerline and on-site substation) are assessed separately.

## 7.1 Construction Phase – PV Facility Components

### 7.1.1 *Altered Sense of Place and Visual Intrusion caused by Construction of the PV Facility*

Visual impacts will be generated by construction activities such as earthworks (which can generate dust) and from construction infrastructure, plant and materials on site (e.g. site camp, plant and machinery, and stockpiles of excavated material). Dust generated during construction will be visually unappealing and may detract from the visual quality (and sense of place) of the area. These impacts are typically limited to the immediate area surrounding the construction site, during the construction period.

Construction activities will have a greater impact within the foreground (< 200 m) as sensitive receptors in close proximity to these activities, albeit a limited number of receptors, will be particularly exposed to these visual impacts.

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<sup>4</sup> As noted in Section 3.2, the PV Facility components include the PV array, BESS, auxiliary buildings and internal grid connection infrastructure.



These construction phase impacts are anticipated to affect adjacent residential receptors to a larger degree than motorists on the R76 or the Unnamed Gravel Road, as their experience of the area is fleeting.

The impact is assessed to be of **medium** significance and with the implementation of mitigation is reduced to **low** (Table 7-2).

## 7.2 Construction Phase – Grid Connection

### 7.2.1 *Altered Sense of Place and Visual Intrusion caused by Construction of the Grid Connection*

Visual impacts will be generated by construction activities such as earthworks (which can generate dust) and from construction infrastructure and plant on site (e.g. plant and machinery, and stockpiles of excavated material). Dust generated during construction will be visually unappealing and may detract from the visual quality (and sense of place) of the area. These impacts are typically limited to the immediate area surrounding the construction site and powerline alignment, during the construction period.

Construction activities will have a greater impact within the foreground (< 200 m) as sensitive receptors in close proximity to these activities, albeit a limited number of receptors, will be particularly exposed to these visual impacts. Furthermore, these receptors are likely to be motorists travelling on the R76 and are less sensitivity visual receptors due to their experience of the area being fleeting.

The impact is assessed to be of **medium** significance and with the implementation of mitigation is reduced to **low** (Table 7-3).

## 7.3 Operational Phase – PV Facility Components

### 7.3.1 *Altered Sense of Place and Visual Intrusion caused by the PV Array*

The PV array will have a development footprint of ~ 390 ha, and may be perceived as conflicting with the current landscape of the grassland and treescapes. While there is some evidence of anthropogenic influence within the surrounding area, there is limited development at the proposed density and type. As such, the proposed PV array is anticipated to interrupt and/or degrade views, and therefore negatively impact the sense of place and present as a visual intrusion across the landscape.

Visual receptors north and south-west (VP 3 - VP 4, VP 8 - VP 10) are expected to experience the PV array as a significant transformation in the landscape, with the PV array visible in the foreground or middle ground (though not obstructing views).

From further afield where the PV array is visible in the background (VP 2 and VP 11), the vertical dimensions of the PV array are almost indiscernible.

The impact is assessed to be of **high** significance and with the implementation of mitigation is reduced to **medium** (Table 7-2).

### 7.3.2 *Altered Sense of Place and Visual Intrusion caused by the BESS and Internal Grid Infrastructure*

The PV Facility will include a BESS and internal grid connections (e.g. 33 kV powerlines). Where possible, the powerlines will be installed underground. While there are a few existing powerlines that traverse the landscape surrounding the site, the proposed powerlines will increase the density of powerlines.



Shipping containers are typically used to house the BESS components. Viewed from a distance, shipping containers are not dissimilar from farmstead buildings. However the BESS (containers) typically cover an area of ~2 ha. As such, the new BESS and internal grid connection are anticipated to contribute to visual clutter on the site and introduce different structures into the landscape, therefore negatively impact the sense of place and presenting as a visual intrusion across the landscape.

Visual receptors to the north-east and south of the site (VP 8, VP 9, VP 11 and VP 5) are expected to have a view of the BESS, substation and internal grid infrastructure, or part thereof, and therefore experience it as a significant transformation in the landscape.

The impact is assessed to be of **medium** significance with and without the implementation of mitigation (Table 7-2).

#### 7.3.3 *Altered Visual Quality caused by Light Pollution at Night*

Lighting will be installed along the perimeter of the PV array(s) and / or around the BESS to improve security.

The installation of lighting on the site perimeter and / or around the BESS will generate nightglow across the natural, undeveloped site and beyond. As such, the introduction of lighting on the site alters the sense of place and visual quality to surrounding receptors, especially those (farmstead) receptors not currently exposed to nightglow emanating from Kroonstad.

Lighting is not easily screened by vegetation or topography, and the proposed lighting for the PV Facility is anticipated to contribute to nightglow from the surrounding residential areas (e.g. Kroonstad) and alter visual quality of the surrounding area.

The impact is assessed to be of **medium** significance and with the implementation of mitigation is reduced to **low** (Table 7-2).

## 7.4 Operational Phase – Grid Connection

#### 7.4.1 *Altered Sense of Place and Visual Intrusion caused by the Grid Connection*

The ~2 km long 132 kV powerline will connect the on-site substation to the Kroonstad switching station ~ 1.5 km to the south of the site. The ~ 15 ha on-site substation will be located adjacent to the south-western boundary of the site.

Due to the short length of the powerline and routing adjacent to an existing powerline, the proposed powerline is not anticipated to add to visual intrusion, nor impact the views of receptors. Furthermore, the proposed powerline may be partially obscured by the existing powerline. An existing substation is located adjacent to the R76, ~2 km south of the proposed project. The proposed substation will therefore not be a novel structure, but will contribute to visual intrusion and visual clutter in the landscape.

The impact is assessed to be of **low** significance with and without the implementation of mitigation (Table 7-3).

#### 7.4.2 *Altered Visual Quality caused by Light Pollution at Night*

Lighting will be installed around the substation to improve security.

The installation of lighting around the substation is anticipated to generate nightglow, altering the sense of place and visual quality to surrounding receptors, especially those (farmstead) receptors not currently exposed to nightglow emanating from Kroonstad.

Lighting is not easily screened by vegetation or topography, and the proposed lighting for the substation is anticipated to contribute to nightglow from the surrounding residential areas (e.g. Kroonstad) and alter visual quality of the surrounding area.

The impact is assessed to be of **medium** significance and with the implementation of mitigation is reduced to **low** (Table 7-3).

## 7.5 Decommissioning Phase – PV Facility Components

### 7.5.1 *Altered Sense of Place caused by Decommissioning Activities*

While the proposed PV Facility and associated infrastructure are anticipated to operate in the long-term, when decommissioning is required, visual impacts will be generated.

The decommissioning of the PV Facility and associated infrastructure will include earthworks, the movement of plant and equipment on site (e.g. plant and machinery, and stockpiles of excavated and salvaged material). Dust generated during decommissioning will be visually unappealing and may detract from the visual quality (and sense of place) of the area. These impacts are typically limited to the immediate area surrounding the site, during the decommissioning period.

Decommissioning activities will have a greater affect within the foreground (< 200 m) as sensitive receptors in close proximity to these activities, albeit a limited number of receptors, will be particularly exposed to these visual impacts.

These decommissioning impacts are anticipated to impact adjacent residential receptors to a larger degree than motorists on the R76 or the Unnamed Gravel Road, as their experience of the area is fleeting.

The impact is assessed to be of **medium** significance and with the implementation of mitigation is reduced to **low** (Table 7-2).

## 7.6 Decommissioning Phase – Grid Connection

### 7.6.1 *Altered Sense of Place caused by the Decommissioning Activities*

While the proposed powerline is anticipated to operate in the long-term, when decommissioning is required visual impacts will be generated.

The decommissioning of the powerline will include earthworks, the movement of plant and equipment on site (e.g. plant and machinery, and stockpiles of excavated/salvaged material). Dust generated during decommissioning will be visually unappealing and may detract from the visual quality (and sense of place) of the area. These impacts are typically limited to the immediate area surrounding the site, during the decommissioning period.

Decommissioning activities will have a greater impact within the foreground (< 200 m) as sensitive receptors in close proximity to these activities, albeit a limited number of receptors, will be particularly exposed to these visual impacts.

These decommissioning impacts are anticipated to impact adjacent residential receptors to a larger degree than motorists on the R76, as their experience of the area is transient.

The impact is assessed to be of **medium** significance and with the implementation of mitigation is reduced to **low** (Table 7-3).

## 7.7 Cumulative Impacts

### 7.7.1 Introduction

For the purposes of this report, cumulative impacts are defined as ‘direct and indirect impacts that act together with existing or future potential impacts of other activities or proposed activities in the area / region that affect the same resources and / or receptors’.

For the most part, cumulative effects or aspects thereof are too uncertain to be quantifiable, due mainly to a lack of data availability and accuracy. This is particularly true of cumulative effects arising from potential or future projects, the design or details of which may not be finalised or available and the direct and indirect impacts of which have not yet been assessed.

For practical reasons, the identification and management of cumulative impacts are limited to those effects generally recognised as important on the basis of scientific concerns and/or concerns of affected communities, in this case effects of other renewable energy facilities and large-scale infrastructure projects.

### 7.7.2 Cumulative Impacts Analysis

In addition to the project, other past, present and future activities have taken place or are proposed within a 35 km radius of the project site that might have caused or may cause impacts and may interact with impacts caused by the project. These are briefly discussed in this section.

Two approved and three proposed PV facilities and associated grid connection infrastructure projects within a 35 km radius of the proposed project site are listed on the Department of Forestry, Fisheries and the Environment (DFFE) South African Renewable Energy EIA Application Database (DFFE, 2022). These projects are listed in Table 7-1 and their location shown in Figure 7-1.

Table 7-1: PV projects within a 35 km radius of the project site

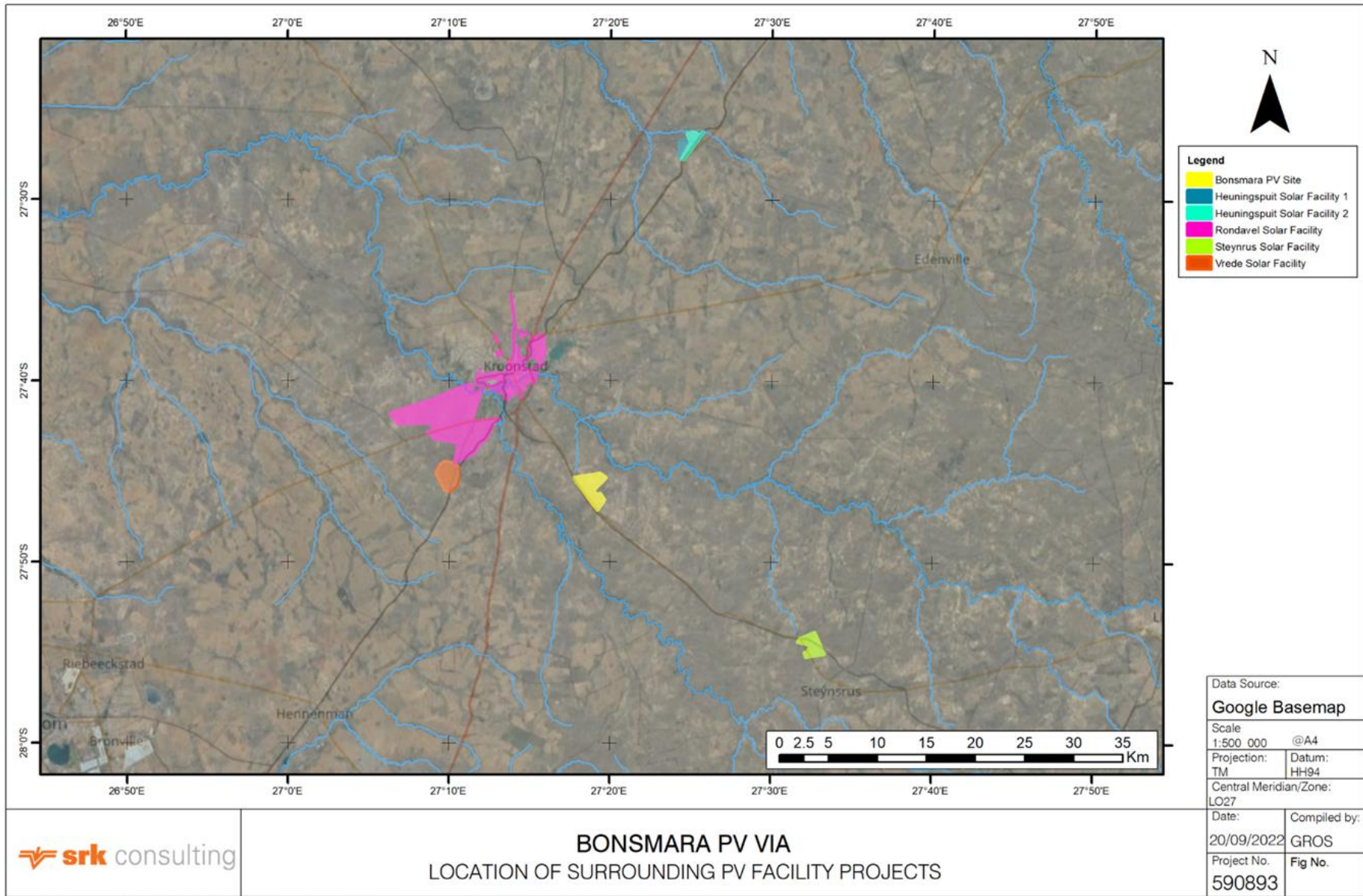
Facility Name / Description	Status	MW	Approximate Footprint
Rondavel Solar Facility	Approved	100 MW	~3 500 ha
Steynrus Solar Facility	Under Amendment	5 MW	~350 ha
Vrede Solar Facility	In process	100 MW	~540 ha
Heuningspuit PV1 Facility	In process	5 MW	~140 ha
Heuningspuit PV2 Facility	In process	5 MW	~175 ha
<b>Total</b>			<b>~4 705 ha</b>

No Wind Energy Facility (WEF) projects within 35 km of the site are listed on the DFFE South African Renewable Energy EIA Application Database.

There are already numerous substations and powerlines in the region, already affecting visual quality and sense of place in this modified rural landscape. As such, the proposed powerlines, BESS and substations

associated with these projects are not the first of their kind in the visual landscape. The Bonsmara PV Facility and other proposed facilities listed above have a combined footprint of ~4 705ha; although large, the facilities are far apart and do not constitute a spatially concentrated, high density network of PV facilities, which mitigates cumulative impacts.

SiVEST's Impact Assessment methodology has been used to evaluate the cumulative visual impacts of the project on the sense of place of the surrounding 35 km radius. The cumulative impact of the PV Facility and the 132 kV powerline is assessed to be of **medium** significance and with the implementation of mitigation is reduced to **low** (Table 7-2 and Table 7-3).



Path: J:\Proj\590893\_SIVEST\_KROONSTAD\_PV\_VIA\8GIS\GISPROJ\MXD\590893\_SIVEST\_BONSMARA\_SURROUNDING\_PV\_MAP.mxd

Figure 7-1: Location of surrounding PV Facility projects

## 7.8 Overall Impact Rating

The impact assessment and ratings for the PV Facility and 132 kV powerline are summarised in Table 7-2 and Table 7-3 below.

Table 7-2: Rating of impacts – PV Facility Components

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I/M	TOTAL	STATUS (+/-)	S		E	P	R	L	D	I/M	TOTAL	STATUS (+/-)	S
<b>Construction Phase</b>																				
Altered Sense of Place and Visual Intrusion caused by Construction Activities	Dust generated during construction will be visually unappealing and may detract from the visual quality (and sense of place) of the area. These impacts are typically limited to the immediate area surrounding the construction site, during the construction period.	2	4	1	2	1	3	30	-	Medium	<ul style="list-style-type: none"> <li>Limit vegetation clearance and the footprint of construction to what is absolutely essential.</li> <li>Consolidate the footprint of the construction camp to a functional minimum.</li> <li>Avoid excavation, handling and transport of materials which may generate dust under very windy conditions.</li> <li>Keep stockpiled aggregates and sand covered to minimise dust generation.</li> <li>Keep construction site tidy.</li> </ul>	2	3	1	2	1	2	18	-	Low
<b>Operational Phase</b>																				
Altered Sense of Place and Visual Intrusion caused by the PV Array	The development of this PV array may be perceived as conflicting with the current landscape of the grassland and treescapes. The proposed PV Facility is anticipated to interrupt and/or degrade views, and therefore negatively impact the sense of place and present as a visual intrusion across the landscape.	2	4	2	3	3	3	42	-	Medium	<ul style="list-style-type: none"> <li>Plant vegetation (that will reach &gt;3 m in height) or establish a vegetated berm (&gt;3 m in height) along the south-western boundary of the site bordering the R76 upon completion of construction.</li> </ul>	2	3	2	2	3	2	24	-	Medium

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I/M	TOTAL	STATUS (+/-)	S		E	P	R	L	D	I/M	TOTAL	STATUS (+/-)	S
Altered Sense of Place and Visual Intrusion caused by the BESS, Substation and Internal Grid Infrastructure	The BESS and internal grid connections (where possible will be installed underground). is anticipated to contribute to visual clutter on the site and therefore negatively impact the sense of place and present as a visual intrusion across the landscape.	2	4	2	3	3	2	28	-	Medium	<ul style="list-style-type: none"> <li>Plant vegetation (that will reach &gt;3 m in height) or establish a vegetated berm (&gt;3 m in height) along the south-western boundary of the site bordering the R76 upon completion of construction.</li> <li>Fence the perimeter of the site with a green or black fencing.</li> <li>Ensure that the roof colour of the proposed buildings blends into the landscape.</li> </ul>	2	3	2	2	3	2	24	-	Medium
Altered Visual Quality caused by Light Pollution at Night	The installation of lighting on the site perimeter and / or around the BESS will generate nightglow across the natural, undeveloped site and beyond. Lighting is not easily screened by vegetation or topography, and the proposed lighting for the PV Facility is anticipated to contribute to nightglow from the surrounding residential areas (e.g. Kroonstad) and alter visual quality of the surrounding area.	2	4	1	3	3	3	39	-	Medium	<ul style="list-style-type: none"> <li>Reduce the height of lighting masts to a workable minimum.</li> <li>Direct lighting inwards and downwards to limit light pollution.</li> </ul>	2	3	1	2	3	2	22	-	Low



ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I/M	TOTAL	STATUS (+/-)	S		E	P	R	L	D	I/M	TOTAL	STATUS (+/-)	S
<b>Decommissioning Phase</b>																				
Altered Sense of Place caused by the decommissioning activities	Dust generated during decommissioning will be visually unappealing and may detract from the visual quality (and sense of place) of the area. These impacts are typically limited to the immediate area surrounding the site, during the decommissioning period.	2	4	1	2	1	3	30	-	Medium	<ul style="list-style-type: none"> <li>Limit vegetation clearance and the footprint of decommissioning to what is absolutely essential.</li> <li>Avoid excavation, handling and transport of materials which may generate dust under very windy conditions.</li> <li>Keep stockpiled aggregates and sand covered to minimise dust generation.</li> <li>Keep site tidy.</li> </ul>	2	3	1	2	1	2	18	-	Low
<b>Cumulative Impact</b>																				
Altered Sense of Place caused by the PV Facility	There are already numerous substations and powerlines in the region, already affecting visual quality and sense of place in this modified rural landscape. As such, the proposed powerlines, BESS and substations associated with these projects are not the first of their kind in the visual landscape. The Bonsmara PV Facility and other proposed facilities listed above have a combined footprint of approximately ~4 705 ha; although large, the facilities are far apart and do not constitute a spatially concentrated, high density network of PV	2	4	1	3	3	2	26	-	Medium	<ul style="list-style-type: none"> <li>Encourage other project owners to implement measures to mitigate the impact of these projects on visual intrusion and altered sense of place, such as screening (vegetation and/or berms) and limit the light pollution generated by these facilities.</li> </ul>	2	3	1	2	3	2	22	-	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION								RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I/M	TOTAL	STATUS (+/-)		S	E	P	R	L	D	I/M	TOTAL	STATUS (+/-)
	facilities, which mitigates cumulative impacts.																		

Table 7-3: Rating of impacts – grid connection

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I/M	TOTAL	STATUS (+/-)	S		E	P	R	L	D	I/M	TOTAL	STATUS (+/-)	S
<b>Construction Phase</b>																				
Altered Sense of Place and Visual Intrusion caused by Construction Activities	Dust generated during construction will be visually unappealing and may detract from the visual quality (and sense of place) of the area. These impacts are typically limited to the immediate area surrounding the construction site and powerline alignment, during the construction period.	2	4	1	2	1	3	30	-	Medium	<ul style="list-style-type: none"> <li>Limit vegetation clearance and the footprint of construction to what is absolutely essential.</li> <li>Consolidate the footprint of the construction camp to a functional minimum.</li> <li>Avoid excavation, handling and transport of materials which may generate dust under very windy conditions.</li> <li>Keep stockpiled aggregates and sand covered to minimise dust generation.</li> <li>Keep construction site tidy.</li> </ul>	2	3	1	2	1	2	18	-	Low
<b>Operational Phase</b>																				
Altered Sense of Place and Visual Intrusion caused by the Grid Connection	The proposed powerline is not anticipated to add to visual intrusion, nor impact the views of receptors. The substation will not be a novel structure in the landscape, but will contribute to visual intrusion and visual clutter in the landscape.	2	3	2	2	3	1	12	-	Low	<ul style="list-style-type: none"> <li>Do not install or affix lights on pylons.</li> </ul>	2	2	2	2	3	1	11	-	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I/M	TOTAL	STATUS (+/-)	S		E	P	R	L	D	I/M	TOTAL	STATUS (+/-)	S
Altered Visual Quality caused by Light Pollution at Night	The installation of lighting around the substation is anticipated to generate nightglow, altering the sense of place and visual quality to surrounding receptors, especially those (farmstead) receptors not currently exposed to nightglow emanating from Kroonstad.	2	4	1	3	3	3	39	-	Medium	<ul style="list-style-type: none"> <li>Reduce the height of lighting masts to a workable minimum.</li> <li>Direct lighting inwards and downwards to limit light pollution.</li> </ul>	2	3	1	2	3	2	22	-	Low
<b>Decommissioning Phase</b>																				
Altered Sense of Place caused by the Decommissioning Activities	Dust generated during decommissioning will be visually unappealing and may detract from the visual quality (and sense of place) of the area. These impacts are typically limited to the immediate area surrounding the site, during the decommissioning period.	2	4	1	2	1	3	30	-	Medium	<ul style="list-style-type: none"> <li>Limit vegetation clearance and the footprint of construction to what is absolutely essential.</li> <li>Avoid excavation, handling and transport of materials which may generate dust under very windy conditions.</li> <li>Keep stockpiled aggregates and sand covered to minimise dust generation.</li> <li>Keep site tidy.</li> </ul>	2	3	1	2	1	2	18	-	Low
<b>Cumulative Impact</b>																				
Altered Sense of Place caused by the Grid Connection	There are already numerous substations and powerlines in the region, already affecting visual quality and sense of place in this modified rural landscape. As such, the proposed powerlines, BESS and substations associated with these projects are not the first of their kind in the visual	2	4	2	3	3	2	28	-	Medium	<ul style="list-style-type: none"> <li>Encourage other project owners to implement measures to mitigate impacts of the powerlines and substations on the visual intrusion and altered sense of place, such as no affixing lights to powerlines and routing the powerlines within corridors.</li> </ul>	2	3	2	2	3	2	24	-	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION								RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I/M	TOTAL	STATUS (+/-)		S	E	P	R	L	D	I/M	TOTAL	STATUS (+/-)
	landscape. The Bonsmara PV Facility and other proposed facilities listed above have a combined footprint of approximately ~4 705 ha; although large, the facilities are far apart and do not constitute a spatially concentrated, high density network of PV facilities, which mitigates cumulative impacts.																		

## 7.9 Input into the EMPr

Table 7-4 provides a description of the key monitoring recommendations for each mitigation measure identified for each phase of the project for inclusion in the EMPr or Environmental Authorisation (EA).

Table 7-4: *EMPr measures*

Impact / Aspect	Mitigation / Management Actions	Responsibility	Methodology	Mitigation / Management Objectives and Outcomes	Frequency
<b>Construction Phase</b>					
Visual Quality (PV Facility and Grid Connection)	<ul style="list-style-type: none"> <li>Limit vegetation clearance and the footprint of construction to what is absolutely essential.</li> </ul>	Contractor	<ul style="list-style-type: none"> <li>Plan which areas require the clearance of vegetation.</li> <li>Only clear the vegetation when works in the area will be undertaken.</li> </ul>	<ul style="list-style-type: none"> <li>Limit deterioration of visual quality.</li> </ul>	Throughout construction
	<ul style="list-style-type: none"> <li>Consolidate the footprint of the construction camp to a functional minimum.</li> </ul>		<ul style="list-style-type: none"> <li>Ensure that the construction camp is consolidated during the design phase</li> </ul>		
	<ul style="list-style-type: none"> <li>Avoid excavation, handling and transport of materials which may generate dust under very windy conditions.</li> </ul>		<ul style="list-style-type: none"> <li>During very windy conditions cease excavation, handling and transportation of materials which may generate dust.</li> </ul>		
	<ul style="list-style-type: none"> <li>Keep stockpiled aggregates and sand covered to minimise dust generation.</li> </ul>		<ul style="list-style-type: none"> <li>Stockpile all aggregates and sand.</li> <li>Keep stockpiles covered when not in use.</li> </ul>		
	<ul style="list-style-type: none"> <li>Keep construction site tidy.</li> </ul>		<ul style="list-style-type: none"> <li>Implement measures to keep the site tidy.</li> </ul>	<ul style="list-style-type: none"> <li>Limit visual clutter and deterioration of visual quality.</li> </ul>	
<b>Operational Phase</b>					
Altered Sense of Place and Visual Intrusion (PV Facility)	<ul style="list-style-type: none"> <li>Plant vegetation (that will reach &gt;3 m in height) or establish a vegetated berm (&gt;3 m in height) along the south-western boundary of the site bordering the</li> </ul>	Developer	<ul style="list-style-type: none"> <li>Plant vegetation to screen the site from the motorists travelling on the R76.</li> <li>Incorporate the berm requirements in the design.</li> </ul>	<ul style="list-style-type: none"> <li>Limit visual intrusion and altered sense of place.</li> </ul>	On completion of construction activities. Throughout operation.

**Bonsmara Solar PV (RF) (Pty) Ltd**

Description: VIA for the Bonsmara Solar PV Facility near Kroonstad, Free State Province

Version No. 2

Date: 20 October 2022

Prepared by: **Kelly Armstrong**



Impact / Aspect	Mitigation / Management Actions	Responsibility	Methodology	Mitigation / Management Objectives and Outcomes	Frequency
	R76 upon completion of construction.				
	<ul style="list-style-type: none"> <li>Install the 33 kV powerlines underground, where possible.</li> </ul>	Developer	<ul style="list-style-type: none"> <li>Incorporate underground powerlines in the design.</li> </ul>		
	<ul style="list-style-type: none"> <li>Fence the perimeter of the site with a green or black fencing.</li> </ul>	Developer	<ul style="list-style-type: none"> <li>Install a perimeter fence.</li> </ul>		
	<ul style="list-style-type: none"> <li>Ensure that the roof colour of the proposed buildings blends into the landscape.</li> </ul>	Developer	<ul style="list-style-type: none"> <li>Incorporate colour requirements in the design.</li> </ul>		
Altered Sense of Place and Visual Intrusion (Grid Connection)	<ul style="list-style-type: none"> <li>Do not install or affix lights on pylons.</li> </ul>	Contractor	<ul style="list-style-type: none"> <li>Prohibit installation of lighting on pylons in the design.</li> </ul>	<ul style="list-style-type: none"> <li>Limit light pollution.</li> </ul>	Once the powerline is installed. Throughout operation.
Altered Visual Quality (PV Facility and Grid Connection)	<ul style="list-style-type: none"> <li>Reduce the height of lighting masts to a workable minimum.</li> <li>Direct lighting inwards and downwards to limit light pollution.</li> </ul>	Developer and Contractor	<ul style="list-style-type: none"> <li>Incorporate lighting requirements in the design.</li> </ul>	<ul style="list-style-type: none"> <li>Limit light pollution.</li> </ul>	Once construction activities have concluded. Throughout operation
<b>Decommissioning Phase</b>					
Visual Quality (PV Facility and Grid Connection)	<ul style="list-style-type: none"> <li>Limit vegetation clearance and the footprint of decommissioning to what is absolutely essential.</li> <li>Consolidate the footprint of the decommissioning camp to a functional minimum.</li> </ul>	Contractor	<ul style="list-style-type: none"> <li>Plan which areas require the clearance of vegetation.</li> <li>Only clear the vegetation when works in the area will be undertaken.</li> <li>Ensure that the decommissioning camp footprint is consolidated where possible.</li> </ul>	<ul style="list-style-type: none"> <li>Limit deterioration of visual quality.</li> </ul>	Throughout decommissioning

Impact / Aspect	Mitigation / Management Actions	Responsibility	Methodology	Mitigation / Management Objectives and Outcomes	Frequency
	<ul style="list-style-type: none"> <li>• Avoid excavation, handling and transport of materials which may generate dust under very windy conditions.</li> <li>• Keep stockpiled aggregates and sand covered to minimise dust generation.</li> <li>• Keep construction site tidy.</li> </ul>		<ul style="list-style-type: none"> <li>• During very windy conditions cease excavation, handling and transportation of materials which may generate dust.</li> <li>• Stockpile all aggregates and sand.</li> <li>• Keep stockpiles covered when not in use.</li> <li>• Implement measures to keep the site tidy.</li> </ul>		

## 7.10 No-Go Alternative

The No Go alternative entails no change to the status quo, in other words, no PV Facility and / or 132 kV powerline (see Section 3.2.3).

Should the application for the Bonsmara 100 MW PV Facility and associated infrastructure be refused the visual impacts will not be realised.

## 8. CONCLUSION

The VIA describes and interprets the visual context or affected environment in which the project is located: this provides a visual baseline or template and aims to ascertain the aesthetic uniqueness of the project area. To better understand the magnitude or intensity of visual and sense of place impacts, the capacity of the project area and receptors to accommodate, attenuate and absorb impacts was analysed. To assess impact significance, the project was “introduced” into the baseline, taking account of the attenuating capacity of the project area.

The following findings are pertinent:

- Bonsmara Solar PV (RF) (Pty) Ltd proposed to develop a 100 MW PV Facility and associated infrastructure, including *inter alia*, a BESS, on-site substation, internal grid connections and a 132 kV powerline to connect the proposed facility to the Kroonstad Switching Station. The proposed PV Facility will occupy ~390 ha on Portion 0 and Portion 1 of Farm 636, near Kroonstad, in the Free State.
- The basis for the visual character of the region is provided by the topography, vegetation and land use of the area, which is predominantly a rural environment characterised by undulating, vegetated landscapes, albeit with pockets of settlements and regional and national roads routed through the surrounding area. The project is defined as a modified rural landscape.
- The visual quality of the area can be experienced through the rolling views of the gentle hills in the landscape and is defined by the fabric of agricultural and grazing land use, with powerlines and a railway line intermittently interrupting views of over the undulating landscape.
- The region has modest scenic value in terms of its undulating natural landscape and the views over large portions of agricultural land. The natural landscape and rustic character contrast the anthropogenic influence in the region, *viz.* urban development some 12 km away.
- The visual exposure of the PV array will be moderate. The viewshed shows that the PV array will be highly visible from the few elevated areas to the north-east, east and south-east of the site. Few of the isolated farmsteads surrounding the site are located in these areas with visibility. Motorists travelling on the R76 will have a view of the site when travelling adjacent to the south-western boundary of the site. The proposed ~2 km powerline will be partially visible due to the short length of the powerline. Furthermore, existing powerlines near the proposed powerline route are expected to have inured receptors to powerlines within the landscape.
- The VAC of the area is generally low due to its rural nature. However, the VAC is increased by the undulating topography and – to a far more limited extent – by the grassland (veld) and small clusters

of trees providing screening. The vegetation is not able to provide screening to the associated infrastructure. The undulating topography will marginally absorb the associated infrastructure.

- The potential receptors of the project include surrounding residents of farmsteads, individuals travelling by rail and motorists on the R76 and the Unnamed Gravel Road. The residents are considered moderately sensitive visual receptors. Motorists and receptors travelling by rail are considered to have relatively low sensitivity as their view of the project is fleeting and temporary.
- The sensitivity of the visual receptors potentially affected by the visual impact of the project is considered to be moderate due to the distance to farmsteads. It is anticipated that the visual receptors are more sensitive to the PV array than the proposed powerline due to the existing powerlines in the landscape.
- The project will be visible in the foreground to motorists travelling directly to the east and west of the site, while the visibility of the project to motorist and railway passengers travelling to the west and south-east of the site is decreased due to screening by vegetation. The project is marginally visible / not visible to surrounding residents due to topography screening the site and the distance from the site. The visibility of the project is moderate due to the number of receptors in the foreground and middleground.
- The PV Facility and powerline are deemed to have low integrity with the surrounding landscape. The proposed PV array will introduce a large, uniform, reflective facility into the area and will be discordant with the current land use, scale and texture of the surrounding area. The BESS will also introduce a novel structure into the landscape that is different and incongruent to the type, size and scale of the existing land use and development in the area. The on-site substation and proposed 132 kV powerline will be moderately consistent and congruent with the use, texture, size and form of existing infrastructure and land use surrounding the site.
- Construction activities associated with the PV Facility and 132 kV powerline will generate visual impacts related to earthworks and construction infrastructure, plant and materials on site. These activities are visually intrusive and will mostly impact receptors in the foreground (<200 m). The impact is assessed to be of medium significance and with the implementation of mitigation is reduced to low.
- The PV array will introduce what may be perceived as a low, uniform industrial artefact into the landscape that is perceived as conflicting with the current landscape. As such, the PV array is anticipated to interrupt and / or degrade views, and therefore negatively impact the sense of place and present as a visual intrusion in the landscape. The impact is assessed to be of high significance and with the implementation of mitigation is reduced to medium.
- The PV Facility will include a BESS and internal grid connections. Where possible the powerlines will be installed underground. The infrastructure will contribute to visual clutter on the site and therefore negatively impact the sense of place and present as a visual intrusion across the landscape. The impact is assessed to be of medium significance with and without the implementation of mitigation.
- Installation of lighting at the PV Facility and on the 132 kV powerline may expose sensitive receptors (e.g. residents) to light pollution, i.e. nightglow. The impact is assessed to be of medium significance and with the implementation of mitigation is reduced to low.
- The development of the 132 kV powerline, due to its short length and routing adjacent to an existing powerline is not anticipated to future degrade views of visual receptors. The impact is assessed to be of low significance with and without the implementation of mitigation.

- The decommissioning activities associated with the PV Facility and the 132 kV powerline will include earthworks and movement of plant and equipment. Dust generated during decommissioning will be visually unappealing and detract from the visual quality and sense of place. The impact is assessed to be of medium significance and with the implementation of mitigation is reduced to low.
- Numerous substations and powerlines in the region already affect visual quality and sense of place in this modified rural landscape. As such, the proposed powerlines, BESS and substations associated with these projects are not the first of their kind in the visual landscape. The Bonsmara PV Facility and other proposed PV facilities within a 35 km radius of Bonsmara PV facility have a combined footprint of ~4 705 ha, however, are located far apart and do not constitute a spatially concentrated, high density network of PV facilities. The cumulative impact of the PV Facility and the 132 kV powerline is assessed to be of **medium** significance and with the implementation of mitigation is reduced to **low**.

## 8.1 Impact Statement

The proposed project introduces a man-made artefact into an agricultural environment, changing the fabric of a large area (~390 ha). The surrounding area also features 132 kV powerline traversing the landscape. As the proposed powerline will be routed adjacent to the existing powerline, it is anticipated that the powerline will not impact on the sense of place and result in visual intrusion to the visual receptors in the surrounding area.

The undulating landscape provides some VAC for the PV Facility, and is expected to marginally screen the powerline. The proposed project is anticipated to have a limited impact on highly sensitive receptors due to the limited number of highly sensitivity visual receptors directly adjacent to the project area. However, railway passengers and motorists – to a greater degree – will have the greatest visibility of the site. This visibility is anticipated to be moderated by their low sensitivity as transient and temporary receptors.

This project will be largely incongruent with the existing agricultural landscape. As such, visual impacts include altered sense of place, visual intrusion and light pollution. This VIA demonstrates that the project will generally result in a moderate visual impact, despite not being located within a REDZ. The construction, operational, decommissioning and cumulative impacts are deemed to be acceptable on the assumption that the mitigation measures listed in Table 7-4 are implemented.

Based on the assessment and the assumption that the mitigation measures will be implemented, the specialist is of the opinion that the visual impacts of the project are acceptable and, from a visual perspective, there is no reason not to authorise the project.

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## Appendix A: Specialist CV

## Appendix B: Impact Assessment Methodology

## Appendix C: Views from Viewpoints



Viewpoint 1: Dennehof Farm - looking north-west towards the site. The proposed site is not visible due to the undulating topography.



Viewpoint 2: R76 South - looking north towards the site. The proposed site is largely screened by tall trees and vegetation, however may be visible in the background to receptors.



Viewpoint 3: R76 Bonsmara – looking north towards the site. The proposed site is visible in the foreground to receptors.





Viewpoint 4: Patrijsdraai Farm – looking north-east towards the site. The site is visible to motorists travelling to and from the farmstead as well as receptors travelling by train. The view of the project will be in the background.



Viewpoint 5: Farmstead 1 – looking south-east towards the site. Due to the topography, the site is not visible to these receptors.



Viewpoint 6: Lan Crest – looking south-east towards the site. Due to the topography, the site is not visible to these receptors.





Viewpoint 7: Farmstead 2 – looking south towards the site. Due to topography, the site is not visible to receptors.



Viewpoint 8: Unnamed Gravel Road – looking south. The site will be visible in the background to receptors.



Viewpoint 9: Unnamed Gravel Road – looking south-west. The site will be visible in the foreground to receptors.





Viewpoint 10: Unnamed Gravel Road – looking west towards the site. The site will be visible in the middleground to receptors.



Viewpoint 11: Farmstead 3 – looking west towards the site. The site will be marginally visible in the background to receptors.



Viewpoint 12: Farmstead 4 – looking south-west towards the site. Due to topography and vegetation, the site is not visible to receptors.

# **SITE SENSITIVITY VERIFICATION (IN TERMS OF PART A OF THE ASSESSMENT PROTOCOLS PUBLISHED IN GN 320 ON 20 MARCH 2020**

## **1 INTRODUCTION**

Bonsmara Solar PV (RF) (Pty) Ltd proposes to develop the 100 MW Bonsmara Solar Photovoltaic (PV) Facility, Battery Energy Storage System (BESS) and associated infrastructure on a site approximately 12 km south-east of the town of Kroonstad, in the Free State Province (the project - Figure 1). The PV Facility and BESS will be located on Portion 0 of Farm 636 and Portion 1 of Farm 636 located in the Moqhaka Local Municipality, in the Fezile Dabi District Municipality. A 2 km long 132 kV powerline will evacuate power to the grid by connecting the on-site substation to the Kroonstad Switching Station.

SRK Consulting (South Africa) (Pty) Ltd (SRK) has been appointed by SiVEST (SA) (Pty) Ltd (SiVEST) to undertake the Visual Impact Assessment (VIA) to inform the Environmental Impact Assessment (EIA) process required in terms of the National Environmental Management Act 107 of 1998 (NEMA), conducted by SiVEST.

In accordance with Appendix 6 of the NEMA EIA Regulations of 2014, a site sensitivity verification has been undertaken in order to confirm the current land use and environmental sensitivity of the proposed project area as identified by the National Web-Based Environmental Screening Tool (Screening Tool).

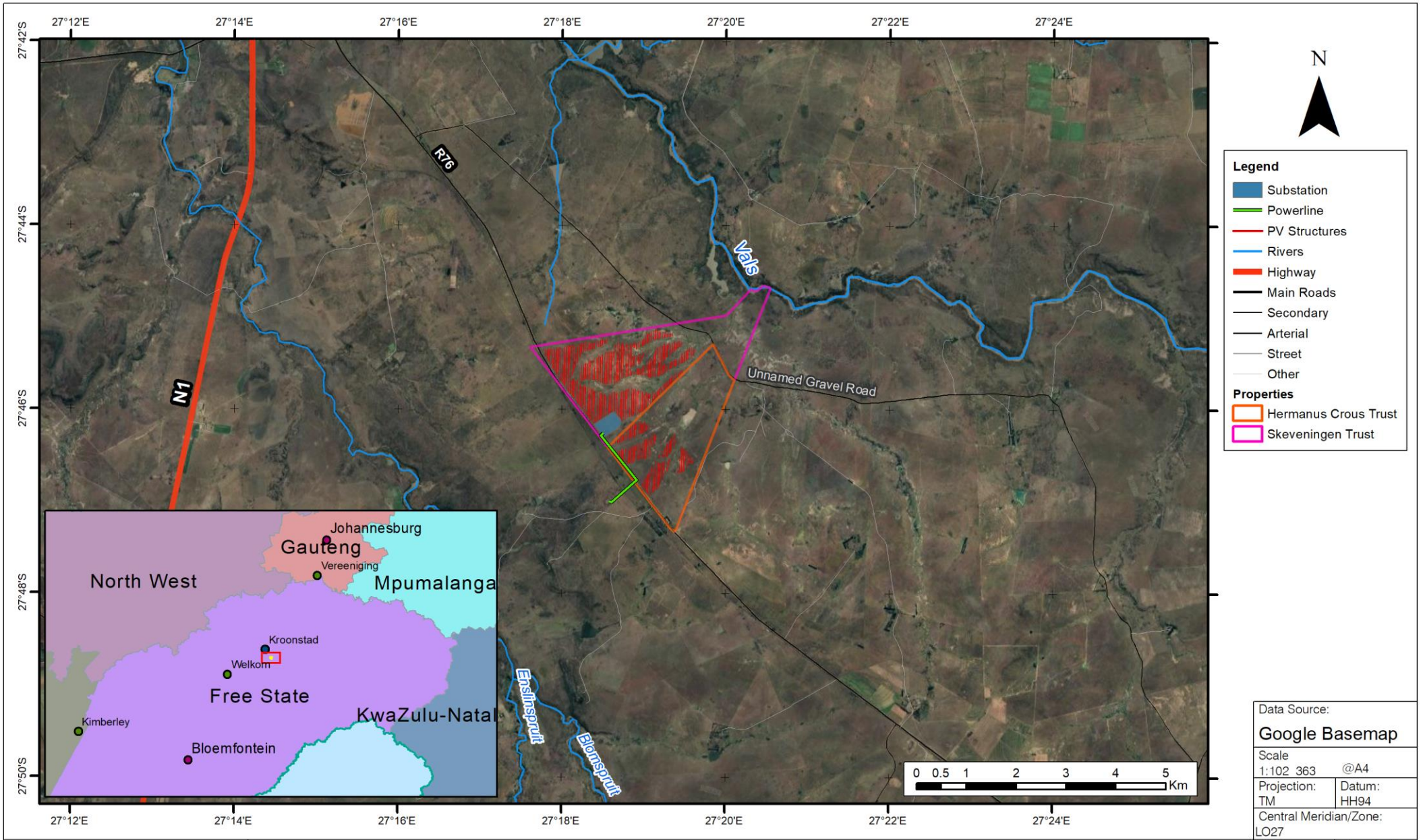
## **2 SITE SENSITIVITY VERIFICATION**

A site visit was undertaken on 13 September 2022. The site visit duration and timing were appropriate to provide the specialist with a representative impression of the site and surroundings.

The following additional information sources were used to inform the site sensitivity verification:

- Maps indicating the location and layout of the project;
- Topographic data, including spatial files with 5 m contours obtained from the Department of Rural Development and Land Reform;
- Aerial images; and
- Other available data on geology, vegetation, land use, receptors etc.





### 3 OUTCOME OF SITE SENSITIVITY VERIFICATION

The magnitude or intensity of various factors are considered when determining and verifying the site sensitivity. These factors include:

- Visual exposure;
- Visual absorption capacity;
- Sensitivity of visual receptors;
- Visibility and viewing distance; and
- Integrity with existing landscape / townscape.

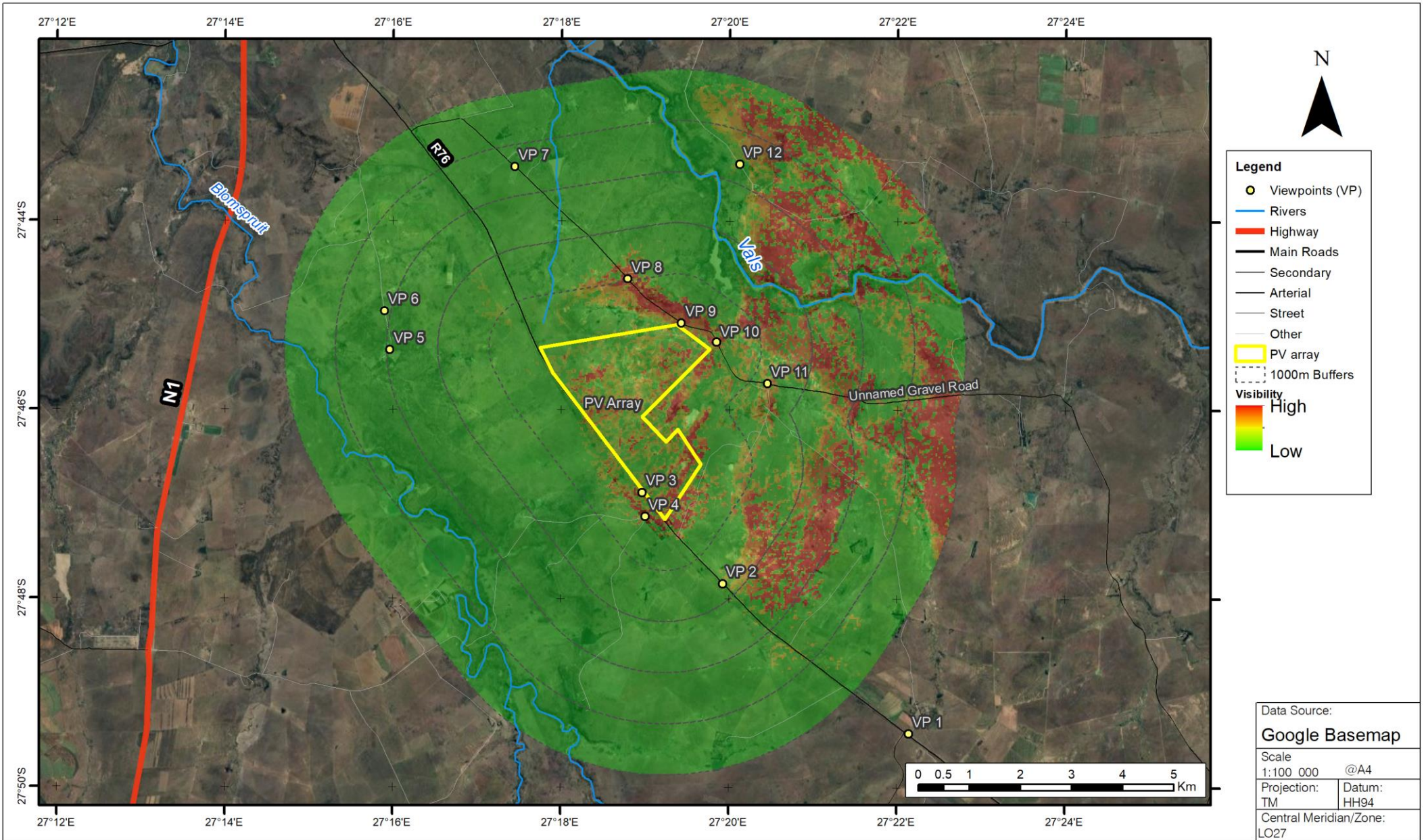
The magnitude or intensity of these factors are summarised below:

- Visual exposure:
  - The project area will be highly visible from the few elevated areas to the north-east, east and south-east of the site. Few of the isolated farmsteads surrounding the site are located within areas identified as having visibility of the site. Motorists on the R76 will have a view of the project when travelling adjacent to the south-western boundary of the site, beyond this portion of the R76 motorists will have limited visibility of the project (Figure 3).
  - The visual exposure of the proposed infrastructure is deemed **moderate**.
- Visual Absorption Capacity (VAC):
  - The project area is marginally increased by undulating topography and – to a far more limited extent – by grasslands (veld) and small clusters of trees, providing screening to the project (Figure 2). The low vertical profile of the PV panels is anticipated to increase the screening potential of the vegetation and topography. Vegetation is not able to provide screening to the associated infrastructure such as the substation and pylons. The undulating topography will marginally absorb the associated infrastructure.
  - The study area has a **low** VAC for the PV facility and a **moderate** VAC for the proposed powerline.



Figure 2: *Vegetation and topography of the surrounding landscape*





**Legend**

- Viewpoints (VP)
- Rivers
- Highway
- Main Roads
- Secondary
- Arterial
- Street
- Other
- ▭ PV array
- ▭ 1000m Buffers

**Visibility**

High

Low

Data Source:	
Google Basemap	
Scale	
1:100 000	@A4
Projection:	Datum:
TM	HH94
Central Meridian/Zone:	
LO27	
Date:	Compiled by:
20/09/2022	GROS
Project No.	Fig No.
590893	

- Visual Sensitivity of Receptors:
  - The moderately sensitivity receptors (farmsteads) are located some distance from the proposed PV facility site. Receptors travelling by road and rail are less sensitive, although they they are fleetingly within close proximity of the site. It is anticipated that the visual receptors will be more sensitive to the PV array, on-site substation and BESS than the proposed powerline due to the (familiarity with) existing powerlines in the landscape.
  - The sensitivity of the visual receptors potentially affected by the visual impact of the project is considered to be **moderate**.
- Viewing Distance and Visibility:
  - The project is highly visible in the foreground to motorists to the east and west of the site. The project is marginally visible / not visible to surrounding residents largely due topography screening the site and distance from the site.
  - The visibility of the project is **moderate** due to the number of receptors in the foreground and middleground, albeit transient and temporary receptors.
- Landscape Integrity:
  - The proposed PV array will introduce a large, uniform, reflective facility into the area and will be discordant with the current land use, scale and texture of the surrounding area (Figure 4). The BESS will also introduce a novel structure into the landscape that is different and incongruent to the type, size and scale of the existing land use and development in the area. The on-site substation and proposed 132 kV powerline will be moderately consistent and congruent with the use, texture, size and form of existing infrastructure and land use surrounding the site.
  - The project is deemed to have **low** integrity with the surrounding landscape.



*Figure 4: Land use of the project site and surrounding area*

As result of the magnitude of the factors considered, the site is considered to be of **high** landscape (visual) sensitivity to the proposed PV facility and associated infrastructure.

## 4 CONCLUSION

The Screening Tool only identifies a landscape (visual) sensitivity theme for the PV facility component of the project. A landscape sensitivity theme is not provided for the 132 kV powerline component. The Screening Tool has identified that the site is of a **very high** Landscape (Solar) Sensitivity for the PV facility.

The site sensitivity verification therefore finds the site to be of **high** landscape sensitivity rather than **very high** as suggested by the Screening Tool.