THE PROPOSED ROOS PV FACILITY AND LILO GRID CONNECTION, MPUMALANGA PROVINCE, SOUTH AFRICA

Visual Impact Assessment

Draft v_5

DATE: 19 July 2023

Document prepared for Juwi South Africa (Pty) Ltd
On behalf of SiVEST (Pty) Ltd

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LIST OF ACRONYMS

APHP	Association of Professional Heritage Practitioners
BLM	Bureau of Land Management (United States)
BPEO	Best Practicable Environmental Option
CALP	Collaborative for Advanced Landscape Planning
DEM	Digital Elevation Model
DoC	Degree of Contrast
EIA	Environmental Impact Assessment
EMPr	Environmental Management Plan
GIS	Geographic Information System

GPS	Global Positioning System
IDP	Integrated Development Plan
IEMA	Institute of Environmental Management and Assessment (United Kingdom)
KOP	Key Observation Point
LVIA	Landscape and Visual Impact Assessment
MAMSL	Metres above mean sea level
NELPAG	New England Light Pollution Advisory Group
PNR	Private Nature Reserve
SDF	Spatial Development Framework
SEA	Strategic Environmental Assessment
VAC	Visual Absorption Capacity
VIA	Visual Impact Assessment
VRM	Visual Resource Management
VRMA	Visual Resource Management Africa
ZVI	Zone of Visual Influence

GLOSSARY OF TECHNICAL TERMS

Technical Terms	**Definition** (Oberholzer, 2005)
Degree of Contrast	The measure in terms of the form, line, colour and texture of the existing landscape in relation to the proposed landscape modification in relation to the defined visual resource management objectives.
Visual intrusion	Issues are concerns related to the proposed development, generally phrased as questions, taking the form of "what will the impact of some activity be on some element of the visual, aesthetic or scenic environment".
Receptors	Individuals, groups or communities who would be subject to the visual influence of a particular project.
Sense of place	The unique quality or character of a place, whether natural, rural or urban.
Scenic corridor	A linear geographic area that contains scenic resources, usually, but not necessarily, defined by a route.
Viewshed	The outer boundary defining a view catchment area, usually along crests and ridgelines. Similar to a watershed. This reflects the area, or the extent thereof, where the landscape modification would probably be seen.
Visual Absorption Capacity	The potential of the landscape to conceal the proposed project.

Technical Term	**Definition** (USDI., 2004)
Key Observation Point	Receptors refer to the people located in the most critical locations, or key observation points, surrounding the landscape modification, who make consistent use of the views associated with the site where the landscape modifications are proposed. KOPs can either be a single point of view that an observer/evaluator uses to

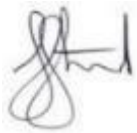
	rate an area or panorama, or a linear view along a roadway, trail, or river corridor.
Visual Resource Management	A map-based landscape and visual impact assessment method development by the Bureau of Land Management (USA).
Zone of Visual Influence	The ZVI is defined as 'the area within which a proposed development may have an influence or effect on visual amenity.'

1 DFFE Specialist Reporting Requirements

Table 1. Specialist declaration of independence.

All intellectual property rights and copyright associated with VRM Africa's services are reserved, and project deliverables, including electronic copies of reports, maps, data, shape files and photographs, may not be modified or incorporated into subsequent reports in any form, or by any means, without the written consent of the author. Reference must be made to this report, should the results, recommendations or conclusions in this report be used in subsequent documentation. Any comments on the draft copy of the Visual Impact Assessment (VIA) must be put in writing. Any recommendations, statements or conclusions drawn from, or based upon, this report, must make reference to it.

This document was completed by Silver Solutions 887 cc trading as VRM Africa, a Visual Impact Study and Mapping organisation located in George, South Africa. VRM Africa cc was appointed as an independent professional visual impact practitioner to facilitate this VIA. I, Stephen Stead, hereby declare that VRM Africa, an independent consulting firm, has no interest or personal gains in this project whatsoever, except receiving fair payment for rendering an independent professional service.



Stephen Stead
APHP accredited VIA Specialist

1.1 Specialist report requirements in terms of Appendix 6 of the EIA Regulations (2014), as amended in 2017.

Table 2: Specialist report requirements table (Pending I&AP comments)

A specialist report prepared in terms of the Environmental Impact Regulations of 2014 (as amended in 2017) must contain:	**Relevant section in report**
Details of the specialist who prepared the report	Stephen Stead, owner / director of Visual Resource Management Africa. steve@vrma.co.za Cell: 0835609911

A specialist report prepared in terms of the Environmental Impact Regulations of 2014 (as amended in 2017) must contain:	Relevant section in report
The expertise of that person to compile a specialist report including a curriculum vitae	Registration with Association of Professional Heritage Practitioners
A declaration that the person is independent in a form as may be specified by the competent authority	Table 1
An indication of the scope of, and the purpose for which, the report was prepared	Terms of Reference
A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change	Baseline Assessment
The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment	NA
A description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Methodology
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 alternative;	Baseline Visual Inventory
An identification of any areas to be avoided, including buffers	Visual Resource Management Classes
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;	VRM Map
A description of any assumptions made and any uncertainties or gaps in knowledge;	Assumptions and Limitations
The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment	27 February 2023
A description of the findings and potential implications of such findings on the impact of the proposed activity or activities	Visual Impact Assessment
Any mitigation measures for inclusion in the EMPr	Environmental Management Plan
Any conditions for inclusion in the environmental authorisation	NA
Any monitoring requirements for inclusion in the EMPr or environmental authorisation	NA
A reasoned opinion as to whether the proposed activity or portions thereof should be authorised	Opportunities and Constraints
Regarding the acceptability of the proposed activity or activities; and	Conclusion
If the opinion is that the proposed activity 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	Pending I&AP comments

A specialist report prepared in terms of the Environmental Impact Regulations of 2014 (as amended in 2017) must contain:	Relevant section in report
A description of any consultation process that was undertaken during the course of carrying out the study	NA
A summary and copies if any comments that were received during any consultation process	Pending EIA process
Any other information requested by the competent authority.	Pending EIA process

1.2 DFFE Screening Tool Site Sensitivity Verification

In terms of Part A of the Assessment Protocols published in GN 320 on 20 March 2020, site sensitivity verification is required relevant to the DFFE Screening Tool. As indicated in Figure 1 below, the Map of Relative Landscape (Solar).

The comments on the DFFE Sensitivity Mapping were informed by the ***site visit that was undertaken on the 27th of February 2023.*** During the survey, photographs and comments were recorded and can be viewed in Annexure A, with the associated map of the survey points as well as the survey tracks. The following table outlines the relevance of the risks raised in the SSV as informed by the site visit.

Table 3. DFFE SSV Landscape Risk table.

DFFE Feature	DFFE Sensitivity	Risk Verification	Motivation
Between 1.5 and 3km from a nature reserve	*High*	**Low**	The proposed PV is located approximately 3km to the northwest of the Cecilla Private Nature Reserve as is located 4,1km to the southwest and is outside of the project ZVI. This NR is part of a coal mine and has low levels of scenic quality that do not add to local tourism planning.
Between 3 and 5km from a nature reserve	*Medium*		
Slopes between 1:4 and 1:10	*High*	**Low**	Slopes of 1 in 4m and 1 in 10m were found within the project development area. These areas do add value to local scenic resources and should be excluded from development. **Based on the findings of the SSVR, these areas were excluded from the development footprint.**
Slopes less than 1:10	*Low*	**Low**	Slopes less than 1 in 10m were found within the project development area. These areas are topographically contained and could be utilized for PV development without significant loss of regional landscape and visual resources.

Mountain Tops and High Ridgelines	*Very High*	**Medium to Low**	The site is located in close proximity to an elevated plateau, with prominence over the lower lying western areas. The development areas are located off prominent ridgelines. Minor ridgelines have been identified and excluded from the development area.

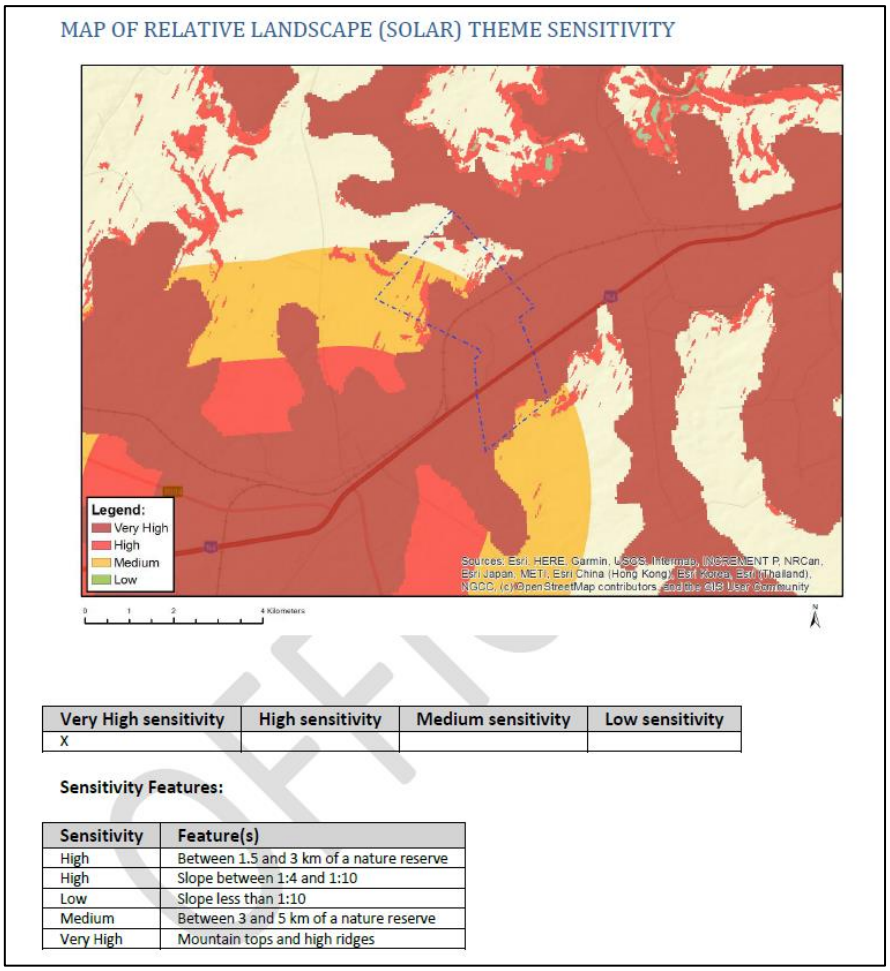


Figure 1. DFFE Screening Tool for Landscape.

2 EXECUTIVE SUMMARY

Visual Resource Management Africa CC (VRMA) was appointed by SiVEST Pty (Ltd) to undertake a ***Visual Impact Assessment*** for the proposed Roos PV Facility VIA on behalf of Juwi South Africa (Pty) Ltd. A ***site visit that was undertaken on the 27 of February 2023.*** During the survey, photographs and comments were recorded and can be viewed in Annexure A.

It is the recommendation that the proposed PV project should be authorised WITH Mitigation. With mitigation, the benefits of the PV related landscape change are likely to outweigh the landscape status quo, where scenic resources are limited. The hydrological areas connecting the network of small farms dams, as well as steep slopes areas on prominent areas have been suitably excluded from the development area. As such, the

preference is for the PV area over the NoGo (retaining the farming status quo) as National energy objectives for renewable energy and job creation will not be met and there is limited potential for landscape-based tourism due to close proximity to the Wonderfontein Silo. Landscape resources will not be significantly altered, and cultural landscape associated with the rural agrarian land uses will continue, as most of the PV areas are located in low prominence areas, or small in scale where a massing effect from views of large PV coverage will not take place. Of the two LILO/ Substation and BESS alternatives, the preferred alternative is also the visually preferred alternative. The landscape and visual impacts are low due to the smaller footprint, low prominence, limited receptors and close proximity to the existing Eskom Powerline.

In terms of Landscape and Visual Impact Significance, the PV project is rated Medium without mitigation, and Medium to Low with mitigation or wind-blown dust, lights at night as well as soil erosion on the PV panels areas located on slope areas (less than 1 in 10m). In terms of negative cumulative effects, without mitigation the risk is rated High due to light spillage in the rural landscape from security lights at night. With mitigation and the careful management of security lighting and no overhead flood lights for the PV. BESS or substation areas, the risk can be reduced to Low. The following key reasons provide the motivation for the overall PV development:

1. The site visual resources are limited with a Medium rating for Scenic Quality and Low rating for Receptor Sensitivity to landscape change.
2. Regionally, the viewshed is contained to some degree from topographic screening and has no High or Medium Exposure Receptors. The nearest significant receptor area is the KNP located 12km to the north where massing effects of the combined views of the PV areas will not generate a dominating visual effect.
3. National energy objectives for renewable energy and job creation will be met and there is a good alignment with regional and local planning with the site located within a REDZ.
4. Medium rating for Visual Impact Significance with mitigation.

POLICY FIT **Medium to High Positive**

In terms of the local and regional planning, while renewable energy (RE) development is encouraged, the importance of tourism is also highlighted. The main aspect that needs to be taken into consideration is the N4 Highway, as this is an important tourist view corridor accessing the eastern conservation areas and parks. As the project is unlikely to impact existing conservation areas of the Cecilia PNR, and no active tourism destinations were identified within local vicinity, the impact to local planning is likely to be Positive. The area is also located within the Emalahleni REDZ 9. The main risk to the planning pertains to the rural agrarian landscape of that does add value to the local and regional scenic quality. **In terms of regional and local planning fit for planned landscape and visual related themes, the expected visual/ landscape policy fit of the landscape change is rated Medium to High Positive.**

METHODOLOGY **Bureau of Land Management's Visual Resource Management (VRM) method**

The methodology for determining landscape significance is based on the United States Bureau of Land Management's Visual Resource Management (VRM) method (USDI., 2004). This GIS-based method allows for increased objectivity and consistency by using standard assessment criteria to classify the landscape type into four VRM Classes, with Class I being the most valued and Class IV, the least. The Classes are derived from *Scenic Quality*, *Visual Sensitivity Levels*, and *Distance Zones*. Specifically, the methodology involved: site survey; review of legal framework; determination of Zone of Visual Influence (ZVI); identification of Visual Issues and Visual Resources; assessment of Potential Visual Impacts; and formulation of Mitigation Measures.

ZONE OF VISUAL INFLUENCE **Local Region**

The visible extent, or viewshed, is "the outer boundary defining a view catchment area, usually along crests and ridgelines" (Oberholzer, 2005). In order to define the extent of the possible influence of the proposed project, a viewshed analysis was undertaken from the proposed site at a specified height above ground level. The Zone of Visual Influence (ZVI) is the area where the proposed landscape change is most likely to be noticed by the casual observer, taking the site visit into account where vegetation, existing development and distance is taken into consideration. This is a subjective appraisal but informed by the viewshed and the other factors mentioned. With regards to the proposed development, **the expected ZVI is likely to be Local Region. This is due to relative height of the site with regards to the lower lying areas to the west, but also influenced by the undulation of the terrain in the area, as well as the constrained views of the PV project from the north, east and south.**

RECEPTORS AND KEY OBSERVATION POINTS **Numerous Receptor locations and three Key Observation Points**

Key Observation Points (KOPs) are the people (receptors) located in strategic locations surrounding the property that make consistent use of the views associated with the site where the landscape modifications are proposed. The following receptors were identified as located withing the ZVI.

- N4 Highway.
- Western Agri-village,
- Western rural farmsteads.

Due to the close proximity of the receptors to the proposed **PV landscape change, the Visual Exposure of the receptors is rated High.**

SCENIC QUALITY **Medium**

The scenic quality of the proposed development site is rated Medium. Landform is rated Medium to Low, as while there are steep slopes that do add local scenic quality, they are not topographically significant. The grassland vegetation depicts some variety, but only one of two major types. Water is apparent in the landscape in the form of a series of small farm dams linked by the two small drainage lines. These features add to the site landscape character. Colours are predominantly grassland related, with khaki browns being the dominant colour. The adjacent scenery is dominated by undulating

grassland, and moderately enhances the overall visual quality. Scarcity is rated Medium as the local landscape is distinctive, though somewhat similar to the others within the region.

RECEPTOR SENSITIVITY TO LANDSCAPE CHANGE **Medium to Low**

Receptor sensitivity to landscape changes is rated Medium to Low. In terms of the Type of Users, maintenance of visual quality is rated a moderate concern for most users as the area is of moderate scenic quality, and not located in a dominant visual position in the landscape. The southern portions of the proposed development areas are located in close proximity to residential receptors, where the amount of use is rated as Moderate for most users. Public Interest in maintenance of visual quality is rated Medium as while there are no tourist related activities located within the ZVI, the area is rural agricultural where rural residents could be sensitive to non-agricultural landscape change. Other than the two small topographic features and the drainage lines and associated dams and steep slopes, no Special Areas were identified within the study area.

VISUAL RESOURCE MANAGEMENT ASSESSMENT

The BLM has defined four Classes that represent the relative value of the visual resources of an area and are defined making use of the VRM Matrix:

i. **Classes I and II** are the most valued.
ii. **Class III** represent a moderate value.
iii. **Class IV** is of least value

Class I (No-go)	• Any river / streams and associated flood lines buffers identified as significant in terms of the WULA process. • Any wetlands identified as significant in terms of the WULA process. • Any ecological areas (or plant species) identified as having a high significance. • Any heritage area identified as having a high significance. • Steep slope areas. • Labour dwellings buffer.
Class II (Not recommended)	• *Ridgeline.* • *Small steep sided valley.*
Class III (Suitable with mitigation)	• Remaining undulating grasslands (PV structures up to approx. 4m above ground)
Class IV (Suitable without mitigation)	• Railway line corridor and powerline line corridor.

EXPECTED IMPACT SIGNIFICANCE

Medium (-ve) *(without mitigation)*	In terms of Landscape and Visual Impact Significance, the PV project is rated Medium without mitigation, and Medium to Low with mitigation or wind-blown dust, lights at night as well as soil erosion on the PV panels areas located on slope areas (less than 1 in 10m).
Medium to Low (-ve) *(with mitigation)*	

CUMULATIVE EFFECTS

High (-ve) *(without mitigation)*	In terms of negative cumulative effects, without mitigation the risk is rated High due to light spillage in the rural landscape from security lights at night. With mitigation and the careful management of security lighting and no overhead flood lights for the PV. BESS or substation areas, the risk can be reduced to Low.
Low (-ve) *(with mitigation)*	

KEY MITIGATIONS MEASURES

Landscape Element	Mitigation	Motivation
Loss of agrarian landscape character	Wind blown dust	Rated High Risk in the DEFF Landscape Solar Mapping, the steep slope areas to the central south should be excluded from the development area.
	Lights at night mitigation and no overhead flood lighting for the PV or substation	Lights at night have the potential to significantly decrease the dark sky sense of place of rural agrarian landscapes. With mitigation, light spillage can be effectively without loss of security.
Skyline intrusion from PV panels	Max height 3.5m	To ensure that visual intrusion does not take place on the small area of development located adjacent to the ridgeline, the panels should be limited to 3.5m in height. As the development area is set back from crest areas, this mitigation would be suitable to reduce visual intrusion from the PV panel located in this area.

3 INTRODUCTION

Visual Resource Management Africa CC (VRMA) was appointed by SiVEST to complete the proposed Roos PV Facility ***Visual Impact Assessment*** on behalf of Juwi South Africa (Pty) Ltd. (Proponent). The proposed development site is located in Mpumalanga Province, Nkangala District Municipality and within the Emakhazeni Local Municipality. The Proponent proposes to construct a photovoltaic facility on a site located 4km from the small town of Wonderfontein.

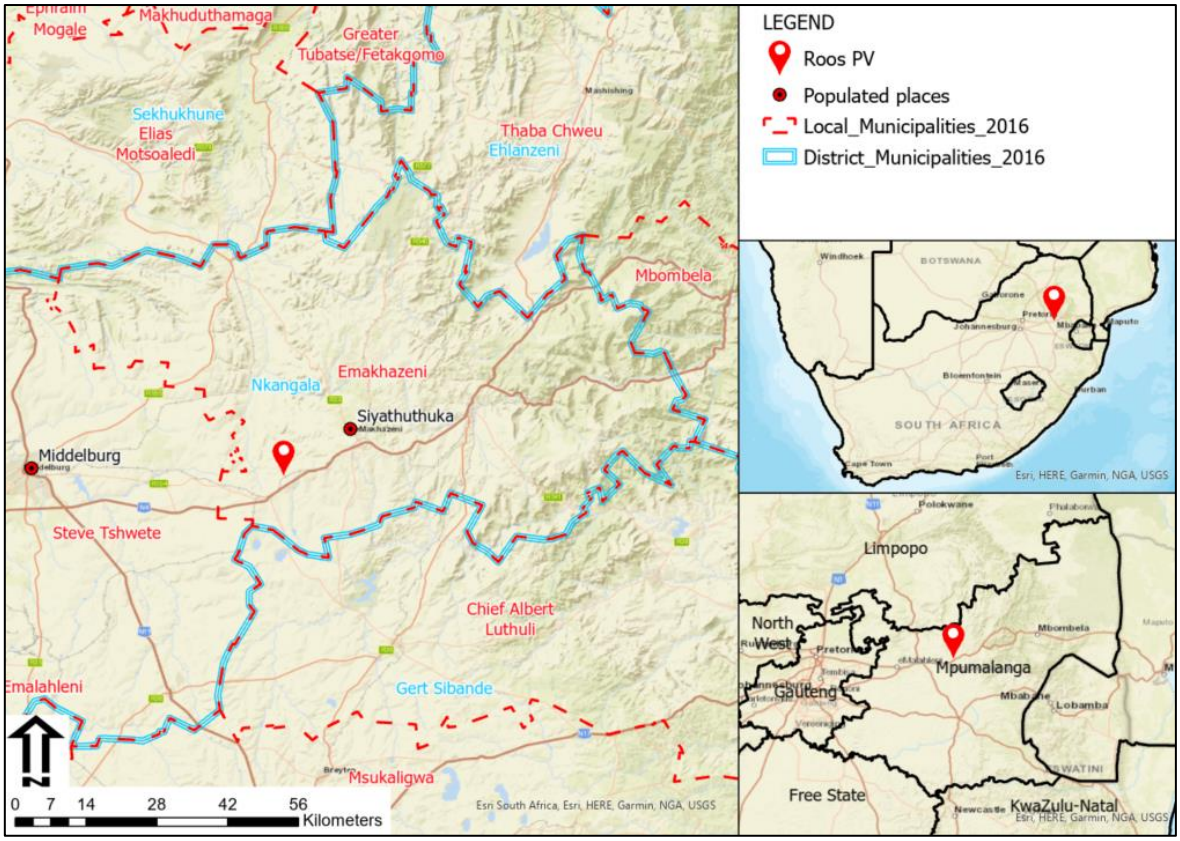


Figure 2: National and regional locality map.

3.1 Terms of Reference

The scope of this study is to cover the entire proposed project area. The broad terms of reference for the study are as follows:

- Collate and analyse all available secondary data relevant to the affected proposed project area. This includes a site visit of the full site extent, as well as of areas where potential impacts may occur beyond the site boundaries.
- Specific attention is to be given to the following:
  - Quantifying and assessing existing scenic resources/visual characteristics on, and around, the proposed site.
  - Evaluation and classification of the landscape in terms of sensitivity to a changing land use.
  - Determining viewsheds, view corridors and important viewpoints in order to assess the visual impacts of the proposed project.
  - Determining visual issues, including those identified in the public participation process.
  - Reviewing the legal framework that may have implications for visual/scenic resources.
  - Assessing the significance of potential visual impacts resulting from the proposed project for the construction, operation and decommissioning phases of the proposed project.
  - Assessing the potential cumulative impacts associated with the visual impact.
  - Generate photomontages of the proposed landscape modification.

- Identifying possible mitigation measures to reduce negative visual impacts for inclusion into the proposed project design, including input into the Environmental Management Programme report (EMPr).

3.2 Study Team

Contributors to this study are summarised in the table below.

Table 4: Authors and Contributors to this Report.

Aspect	Person	Organisation / Company	Qualifications
Landscape and Visual Assessment (author of this report)	Stephen Stead B.A (Hons) Human Geography, 1991 (UKZN, Pietermaritzburg)	VRMA	• Accredited with the Association of Professional Heritage Practitioner and • 16 years of experience in visual assessments including renewable energy, Power lines, roads, dams across southern Africa. • Registered with the Association of Professional Heritage Practitioners since 2014.

3.3 Visual Assessment Approach

The full methodology used in the assessment can be found in Annexure D, with this section outlining the key elements of the assessment process. The process that VRM Africa follows when undertaking a VIA is based on the United States Bureau of Land Management's (BLM) Visual Resource Management method (USDI., 2004). This mapping and GIS-based method of assessing landscape modifications allows for increased objectivity and consistency by using standard assessment criteria.

- *"Different levels of scenic values require different levels of management. For example, management of an area with high scenic value might be focused on preserving the existing character of the landscape, and management of an area with little scenic value might allow for major modifications to the landscape. Determining how an area should be managed first requires an assessment of the area's scenic values".*
- *"Assessing scenic values and determining visual impacts can be a subjective process. Objectivity and consistency can be greatly increased by using the basic design elements of form, line, colour, and texture, which have often been used to describe and evaluate landscapes, to also describe proposed projects. Projects that repeat these design elements are usually in harmony with their surroundings; those that don't create contrast. By adjusting project designs so the elements are repeated, visual impacts can be minimized"* (USDI., 2004).

Baseline Phase Summary

The VRM process involves the systematic classification of the broad-brush landscape types within the receiving environment into one of four VRM Classes. Each VRM Class is associated with management objectives that serve to guide the degree of modification of the proposed site. The Classes are derived by means of a simple matrix with the three variables being the scenic quality, the expected receptor sensitivity to landscape change, and the distance of the proposed landscape modification from key receptor points. The

Classes are not prescriptive and are utilised as a guideline to determine visual carrying capacity, where they represent the relative value of the visual resources of an area. Classes I and II are the most valued, Class III represents a moderate value; and Class IV is of least value. The VRM Classes are not prescriptive and are used as a guideline to determine the carrying capacity of a visually preferred landscape as a basis for assessing the suitability of the landscape change associated with the proposed project.

Table 5: VRM Class Matrix Table

		VISUAL SENSITIVITY LEVELS								
		High			Medium			Low		
SCENIC QUALITY	A (High)	II	II	II	II	II	II	II	II	II
	B (Medium)	II	III	III/ IV *	III	IV	IV	IV	IV	IV
	C (Low)	III	IV	IV	IV	IV	IV	IV	IV	IV
DISTANCE ZONES		Fore/middle ground	Background	Seldom seen	Fore/middle ground	Background	Seldom seen	Fore/middle ground	Background	Seldom seen

* If adjacent areas are **Class III** or lower, assign **Class III**, if higher, assign **Class IV**

The visual objectives of each of the classes are listed below:

- The Class I objective is to preserve the existing character of the landscape and the level of change to the characteristic landscape should be very low and must not attract attention. Class I is assigned when a decision is made to maintain a natural landscape.
- The Class II objective is to retain the existing character of the landscape and the level of change to the characteristic landscape should be low. The proposed development may be seen but should not attract the attention of the casual observer, and should repeat the basic elements of form, line, colour and texture found in the predominant natural features of the characteristic landscape.
- The Class III objective is to partially retain the existing character of the landscape, where the level of change to the characteristic landscape should be moderate. The proposed development may attract attention, but should not dominate the view of the casual observer, and changes should repeat the basic elements found in the predominant natural features of the characteristic landscape; and
- The Class IV objective is to provide for management activities that require major modifications of the existing character of the landscape. The level of change to the landscape can be high, and the proposed development may dominate the view and be the major focus of the viewer's (s') attention without significantly degrading the local landscape character.

Impact Phase Summary

To determine impacts, a degree of contrast exercise is undertaken. This is an assessment of the expected change to the receiving environment in terms of the form, line, colour and texture, as seen from the surrounding Key Observation Points. This determines if the

proposed project meets the visual objectives defined for each of the Classes. If the expected visual contrast is strong, mitigation recommendations are to be made to assist in meeting the visual objectives. To assist in the understanding of the proposed landscape modifications, visual representation, such as photomontages or photos depicting the impacted areas, can be generated. There is an ethical obligation in the visualisation process, as visualisation can be misleading if not undertaken ethically.

3.4 VIA Process Outline

The following approach was used in understanding the landscape processes and informing the magnitude of the impacts of the proposed landscape modification. The table below lists a number of standardised procedures recommended as a component of best international practice.

Table 6: Methodology Summary Table

Action	***Description***
Site Survey	The identification of existing scenic resources and sensitive receptors in and around the study area to understand the context of the proposed development within its surroundings to ensure that the intactness of the landscape and the prevailing sense of place are taken into consideration.
Project Description	Provide a description of the expected project, and the components that will make up the landscape modification.
Reviewing the Legal Framework	The legal, policy and planning framework may have implications for visual aspects of the proposed development. The heritage legislation tends to be pertinent in relation to natural and cultural landscapes, while Strategic Environmental Assessments (SEAs) for renewable energy provide a guideline at the regional scale.
Determining the Zone of Visual Influence	This includes mapping of viewsheds and view corridors in relation to the proposed project elements, in order to assess the zone of visual influence of the proposed project. Based on the topography of the landscape as represented by a Digital Elevation Model, an approximate area is defined which provides an expected area where the landscape modification has the potential to influence landscapes (or landscape processes) or receptor viewpoints.
Identifying Visual Issues and Visual Resources	Visual issues are identified during the public participation process, which is being carried out by others. The visual, social or heritage specialists may also identify visual issues. The significance and proposed mitigation of the visual issues are addressed as part of the visual assessment.
Assessing Potential Visual Impacts	An assessment is made of the significance of potential visual impacts resulting from the proposed project for the construction, operational and decommissioning phases of the project. The rating of visual significance is based on the methodology provided by the Environmental Assessment Practitioner (EAP).
Formulating Mitigation Measures	Possible mitigation measures are identified to avoid or minimise negative visual impacts of the proposed project. The intention is

Action	Description
	that these would be included in the project design, the Environmental Management Programme report (EMPr) and the authorisation conditions.

3.5 SiVEST Impact Methodology

SiVest has provided a standardised Environment Impact Assessment (EIA) Methodology to assisting the evaluation of the overall effects of the proposed activity on the environment, determining significance through a systemic analysis. Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale (i.e., site, local, national or global), whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. For further details of the EIA methodology, refer to Appendix B.

3.6 VRMA Impact Assessment Methodology

The following impact criteria were used to assess visual impacts. The criteria were defined by the Western Cape *DEA&DP Guideline for involving Visual and Aesthetic Specialists in EIA Processes* (Oberholzer, 2005).

Table 7. DEA&DP Visual and Aesthetic Guideline Impact Assessment Criteria Table.

Criteria	Definition
Extent	The spatial or geographic area of influence of the visual impact, i.e.: • *site-related:* extending only as far as the activity. • *local:* limited to the immediate surroundings. • *regional:* affecting a larger metropolitan or regional area. • *national:* affecting large parts of the country. • *international:* affecting areas across international boundaries.
Duration	The predicted life-span of the visual impact: • *short term,* (e.g., duration of the construction phase). • *medium term,* (e.g., duration for screening vegetation to mature). • *long term,* (e.g., lifespan of the project). • *permanent,* where time will not mitigate the visual impact.
Intensity	The magnitude of the impact on views, scenic or cultural resources. • *low,* where visual and scenic resources are not affected. • *medium,* where visual and scenic resources are affected to a limited extent. • *high,* where scenic and cultural resources are significantly affected.
Probability	The degree of possibility of the visual impact occurring: • *improbable,* where the possibility of the impact occurring is very low. • *probable,* where there is a distinct possibility that the impact will occur. • *highly probable,* where it is most likely that the impact will occur. • *definite,* where the impact will occur regardless of any prevention measures.

Significance	The significance of impacts can be determined through a synthesis of the aspects produced in terms of their nature, duration, intensity, extent and probability, and be described as: • *low,* where it will not have an influence on the decision. • *medium,* where it should have an influence on the decision unless it is mitigated. • *high,* where it would influence the decision regardless of any possible mitigation.

3.7 Assumptions and Uncertainties

- Digital Elevation Models (DEM) and viewsheds were generated using ASTER elevation data (NASA, 2009). Although every effort to maintain accuracy was undertaken, as a result of the DEM being generated from satellite imagery and not being a true representation of the earth's surface, the viewshed mapping is approximate and may not represent an exact visibility incidence. Thus, specific features identified from the DEM and derive contours (such as peaks and conical hills) would need to be verified once a detailed survey of the project area has taken place.
- The use of open-source satellite imagery was utilised for base maps in the report.
- Some of the mapping in this document was created using Bing Maps, Open-Source Map, ArcGIS Online and Google Earth Satellite imagery.
- The project deliverables, including electronic copies of reports, maps, data, shape files and photographs are based on the author's professional knowledge, as well as available information.
- VRM Africa reserves the right to modify aspects of the project deliverables if and when new/additional information may become available from research or further work in the applicable field of practice or pertaining to this study.
- As access to farms and private property is often limited due to security reasons, limiting access to private property in order that photographs from specific locations are taken. 3D modelling is used to reflect the expected landscape change area where applicable.
- Mapping makes use of the SANI BGIS webmap (SANBI, 2018).
- The slopes analysis is approximate and is subject to detailed survey and detailed slopes analysis.

4 PROJECT DESCRIPTION

The following information (italics) and table outlines the project information that was provided by the client that will be incorporated into the assessment and proposed infrastructure relating to the project.

JUWI South Africa (Pty) Ltd (hereafter referred to as "JUWI"), has appointed SiVEST SA (Pty) Ltd (hereafter referred to as "SiVEST") to undertake the required Environmental Processes for the proposed renewable energy facility, located on various land parcels in the western part of Mpumalanga, in the Emakhazeni Local Municipality.

Table 8: Project Information Table

PROPONENT SPECIFICATIONS	
Applicant Details	**Description**
Applicant Name:	Juwi South Africa (Pty) Ltd
Project Name:	Roos PV Facility
Land Parcels	The land parcels for the entire hybrid facility are listed below: • • RE of the Farm Leeuwbank No 427 • • Portion 3 of the Farm No 426 • • Portion 4 of the Farm Leeuwbank No 427 • • Portion 5 of the Farm Leeuwbank No 427 • • Portion 6 of the Farm Zoekop No 426 • • Portion 8 of the Farm Wintershoek No 423 • • Portion 8 of the Farm Wintershoek No 390 • • Portion 9 of the Farm Wintershoek No 390 • • Portion 9 of the Farm Zoekop No 426 • • Portion 14 of the Farm Generaalsdraai No 423 • • Portion 16 of the Farm Zoekop No 426 • • Portion 17 of the Farm Leeuwbank No 427 • • Portion 19 of the Farm Leeuwbank No 427 • • Portion 38 of the Farm Leeuwbank No 427

The project involves the development of a PV project and associated infrastructure. The following infrastructure is likely to be developed:

Table 9: Project Description Table provided by SiVEST for assessment.

TECHNICAL DETAILS	
PV panels	▪ Mounting: Fixed-tilt PV, single-axis tracking PV or double-axis tracking PV. ▪ Module type: mono- or bi-facial ▪ up to approx. 3.5m PV panels
Access roads	▪ Main site access: Up to 8m, during construction and operation ▪ Internal roads: Approx. 4 - 5m, during construction and operation ▪ Existing roads will be utilised as far as reasonably possible and upgraded where necessary. Upgraded width: Up to 8m.
On-site Substation	▪ Substation will generally be stepping up from 22kV or 33kV to 88kV or 132kV. ▪ Maximum height of on-site substations: up to 10 m ▪ The proposed project will include one on-site substation hub incorporating the facility substation, switchyard, collector infrastructure, battery energy storage system (BESS) and associated O&M buildings.). ▪ Onsite substation size: Up to 4ha (for on-site substation hub)
Construction camp	▪ No construction camps would be developed, and labour would be sourced from nearby areas, as per relevant procurement requirements.
Temporary construction laydown / staging area	▪ Temporary Laydown Area: up to approximately 7 ha. ▪ Locations: TBC
Operation and Maintenance (O&M) buildings	▪ All Auxiliary buildings to be developed include, but are not limited to: O&M building, site office, staff lockers, bathrooms, warehouses, etc. ▪ Footprint up to 0.5 ha (i.e., 5000 m^2) Height (m): Up to 10 m
On-site IPP Electrical infrastructure	▪ *"Cables will be laid underground wherever technically feasible, with overhead 33kV lines grouping PV areas to crossing valleys and ridges to get to the on-site substation."* ▪ The proposed project will include one on-site substation hub incorporating the facility substation, switchyard, collector infrastructure, battery energy storage system (BESS) and associated O&M buildings.). ▪ Internal underground lines of up to 33 kV (22kV or 33kV).

	▪ Substation will generally be stepping up from 22kV or 33kV to 88kV or 132kV. ▪ Depth (m): Up to 1.5 m
Fencing	▪ Height: Up to 3m ▪ The entire perimeter of the proposed facility will be secured. ▪ Length: TBC ▪ Type: Could be Palisade or mesh or fully electrified.
Boreholes and storage tanks (if applicable)	▪ If required, a 10,000l storage tank may be located on site for water storage.
Battery Energy Storage Systems	▪ Capacity in MWh: Up to 500MW/ 500MWh ▪ Size in hectare - A BESS would be developed within the substation/electrical infrastructure hub footprint, if required. ▪ Height: Up to 8 m ▪ Technology type (i.e.: Li-Ion solid state/Redox flow) Electrochemical Batteries including: a. Lead Acid and Advanced Lead Acid b. Lithium ion, NiCd, NiMH-based Batteries c. High Temperature (NaS, Na-NiCl2, Mg/PB-Sb) d. Flow Batteries (VRFB, Zn-Fe, Zn-Br) The BESS would therefore comprise the selected batteries together with chargers, inverters and related equipment.
Estimated number of employment opportunities generated by each PV project	▪ Construction phase: 100 (skills split would be in line with applicable procurement requirements but would be roughly 60% low-skilled, 25% semi-skilled and 15% skilled) ▪ Operational phase: 10 (skills split would be in line with applicable procurement requirements but would be roughly 70% low skilled, 25% semi-skilled and 5% skilled ▪ Decommissioning phase: unknown
Construction: Methodology	▪ The facility would be constructed in the following sequence: 1) Final design and micro-siting of the infrastructure based on topographical conditions and environmental sensitivities, and following obtaining required environmental permits. 2) Vegetation clearance and construction of access roads (where required) 3) Construction of foundations 4) Assembly and erection of infrastructure on site 5) Stringing of inverters 6) Rehabilitation of disturbed areas 7) Continued maintenance

(www.hawaiirenewableenergy.org/Villamesias2, n.d.)

(Junior Mining Network, n.d.)

Figure 3: Photographic example of what the proposed Roos PV could look like as fixed and single portrait model on a tracker.

Figure 4. Example of a Photomontage of Tesla BESS in landscape

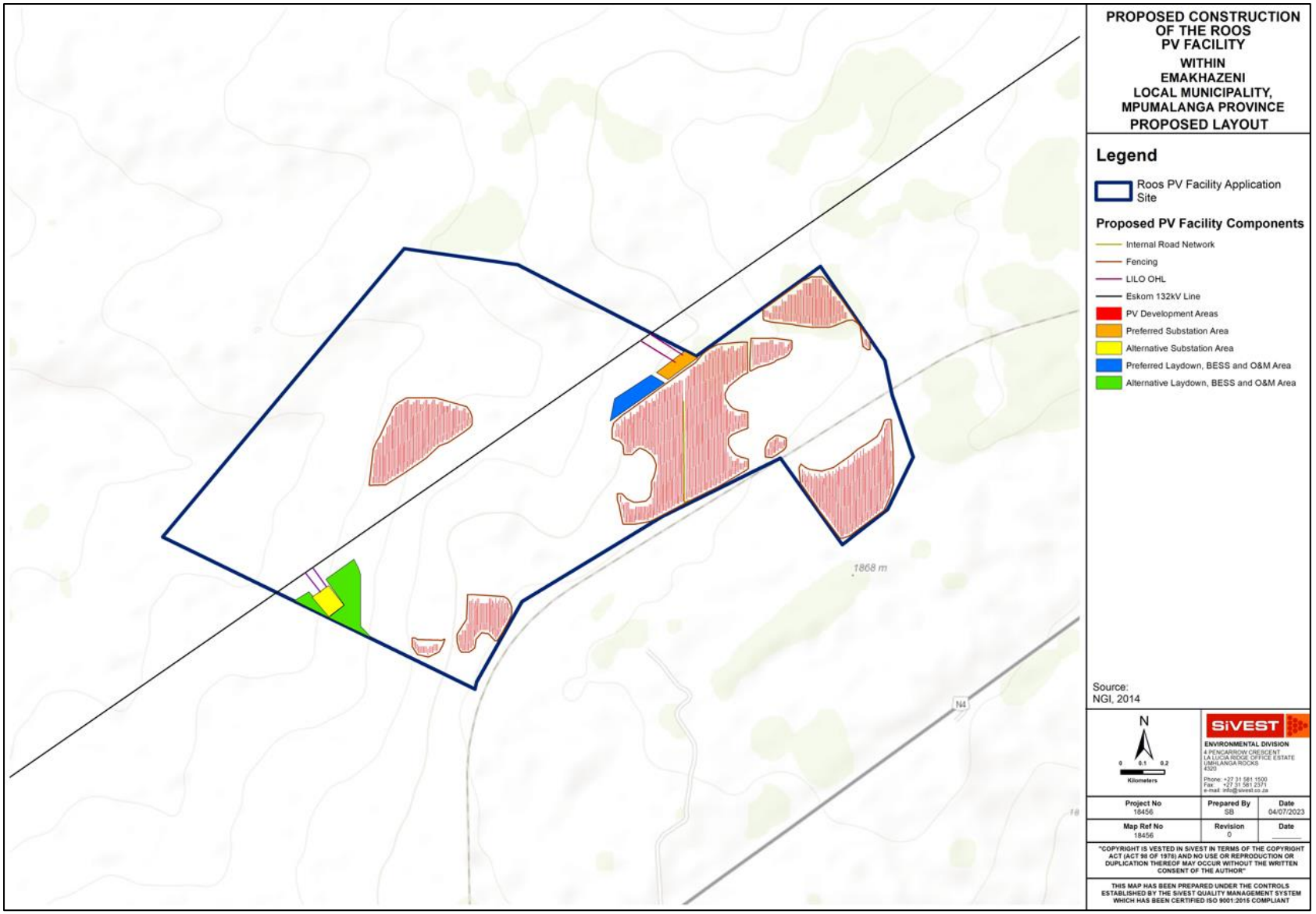


Figure 5: Proposed layout plan provided by the client.

5 LEGAL FRAMEWORK

In order to comply with the Visual Resource Management requirements, it is necessary to relate the proposed landscape modification in terms of international best practice in understanding landscapes and landscape processes. The proposed project also needs to be evaluated in terms of 'policy fit'. This requires a review of International, National and Regional best practice, policy and planning for the area to ensure that the scale, density and nature of activities or developments are harmonious and in keeping with the planned sense of place and character of the area.

5.1 International Good Practice

For cultural landscapes, the following documentation provides good practice guidelines, specifically:

- Guidelines for Landscape and Visual Impact Assessment (GLVIA), Second Edition.
- International Finance Corporation (IFC).
- Millennium Ecosystem Assessment (MEA).
- United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Convention (WHC).

5.1.1 Guidelines for Landscape and Visual Impact Assessment, Second Edition

The Landscape Institute and the Institute of Environmental Management and Assessment (United Kingdom) have compiled a book outlining best practice in landscape and visual impact assessment. This has become a key guideline for LVIA in the United Kingdom. "The principal aim of the guideline is to encourage high standards for the scope and context of landscape and visual impact assessments, based on the collegiate opinion and practice of the members of the Landscape Institute and the Institute of Environmental Management and Assessment. The guidelines also seek to establish certain principles and will help to achieve consistency, credibility and effectiveness in landscape and visual impact assessment, when carried out as part of an EIA" (The Landscape Institute, 2003);

In the introduction, the guideline states that 'Landscape encompasses the whole of our external environment, whether within village, towns, cities or in the countryside. The nature and pattern of buildings, streets, open spaces and trees – and their interrelationships within the built environment – are an equally important part of our landscape heritage" (The Landscape Institute, 2003: Pg. 9). The guideline identifies the following reasons why landscape is important in both urban and rural contexts, in that it is:

- An essential part of our natural resource base.
- A reservoir of archaeological and historical evidence.
- An environment for plants and animals (including humans).
- A resource that evokes sensual, cultural and spiritual responses and contributes to our urban and rural quality of life; and
- Valuable recreation resources. (The Landscape Institute, 2003).

5.1.2 International Finance Corporation (IFC)

The IFC Performance Standards (IFC, 2012) do not explicitly cover visual impacts or assessment thereof. Under IFC PS 6, ecosystem services are organized into four categories, with the third category related to cultural services which are defined as "the non-

material benefits people obtain from ecosystems" and "may include natural areas that are sacred sites and areas of importance for recreation and aesthetic enjoyment" (IFC, 2012).

However, the IFC Environmental Health and Safety Guidelines for Electric Power Transmission and Distribution (IFC, 2007) specifically identifies the risks posed by power transmission and distribution projects to create visual impacts to residential communities. It recommends mitigation measures to be implemented to minimise visual impact. These should include the siting of powerlines and the design of substations with due consideration to landscape views and important environmental and community features. Prioritising the location of high-voltage transmission and distribution lines in less populated areas, where possible, is promoted.

IFC PS 8 recognises the importance of cultural heritage for current and future generations and aims to ensure that projects protect cultural heritage. The report defines Cultural Heritage as "(i) tangible forms of cultural heritage, such as tangible moveable or immovable objects, property, sites, structures, or groups of structures, having archaeological (prehistoric), paleontological, historical, cultural, artistic, and religious values; (ii) unique natural features or tangible objects that embody cultural values, such as sacred groves, rocks, lakes, and waterfalls" (IFC, 2012). The IFC PS 8 defines Critical Heritage as "one or both of the following types of cultural heritage: (i) the internationally recognized heritage of communities who use or have used within living memory the cultural heritage for long-standing cultural purposes; or (ii) legally protected cultural heritage areas, including those proposed by host governments for such designation" (IFC, 2012).

Legally protected cultural heritage areas are identified as important in the IFC PS 8 report. This is for "the protection and conservation of cultural heritage, and additional measures are needed for any projects that would be permitted under the applicable national law in these areas". The report states that "in circumstances where a proposed project is located within a legally protected area or a legally defined buffer zone, the client, in addition to the requirements for critical cultural heritage, will meet the following requirements:

- Comply with defined national or local cultural heritage regulations or the protected area management plans.
- Consult the protected area sponsors and managers, local communities and other key stakeholders on the proposed project; and
- Implement additional programs, as appropriate, to promote and enhance the conservation aims of the protected area". (IFC, 2012).

5.1.3 Millennium Ecosystem Assessment

In the Ecosystems and Human Well-being document compiled by the Millennium Ecosystem Assessment in 2005, Ecosystems are defined as being "essential for human well-being through their provisioning, regulating, cultural, and supporting services. Evidence in recent decades of escalating human impacts on ecological systems worldwide raises concerns about the consequences of ecosystem changes for human well-being". (Millennium Ecosystem Assessment, 2005)

The Millennium Ecosystem Assessment defined the following non-material benefits that can be obtained from ecosystems*:*

- Inspiration: Ecosystems provide a rich source of inspiration for art, folklore, national symbols, architecture, and advertising.
- Aesthetic values: Many people find beauty or aesthetic value in various aspects of ecosystems, as reflected in the support for parks, scenic drives, and the selection of housing locations.
- Sense of place: Many people value the “sense of place” that is associated with recognised features of their environment, including aspects of the ecosystem.
- Cultural heritage values: Many societies place high value on the maintenance of either historically important landscapes (“cultural landscapes”) or culturally significant species; and
- Recreation and ecotourism: People often choose where to spend their leisure time based in part on the characteristics of the natural or cultivated landscapes in a particular area. (Millennium Ecosystem Assessment, 2005)

The Millennium Ecosystem Assessment Ecosystems and Human Well-being: Synthesis report indicates that there has been a “rapid decline in sacred groves and species” in relation to spiritual and religious values, and aesthetic values have seen a “decline in quantity and quality of natural lands”. (Millennium Ecosystem Assessment, 2005)

5.2 National and Regional Legislation and Policies

In order to comply with the Visual Resource Management requirements, it is necessary to clarify which National and Regional planning policies govern the proposed development area to ensure that the scale, density and nature of activities or developments are harmonious and in keeping with the sense of place and character of the area as mapped in Figure 6 below.

- DEA&DP Visual and Aesthetic Guidelines.
- REDZ Planning.
- Regional and Local Municipality Planning and Guidelines.

Table 10: List of key planning informants to the project.

Theme	Requirements
Province	Mpumalanga
District Municipality	Nkangala
Local Municipality	Emakhazeni
REDZ	REDZ 9

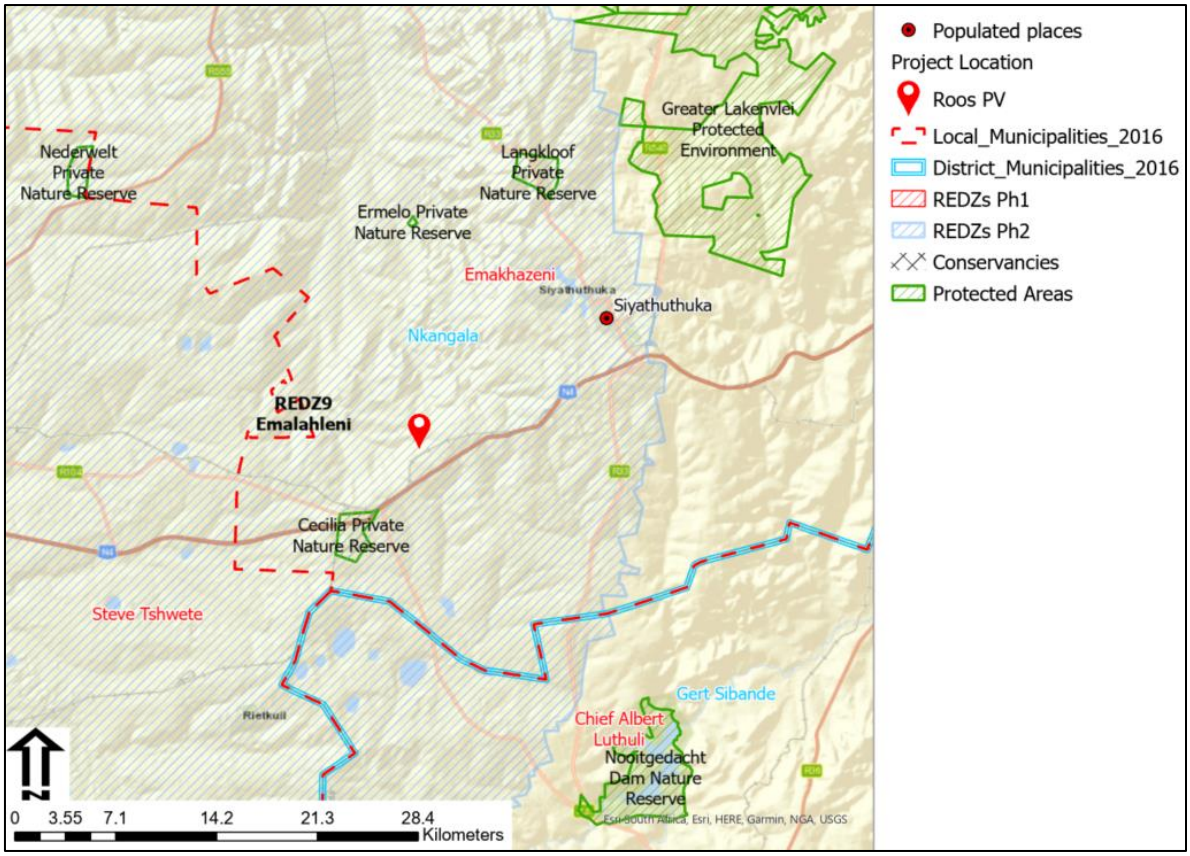


Figure 6: Planning locality map depicting the local, district and national planning zones.

5.2.1 DEA&DP Visual and Aesthetic Guidelines

Reference to the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) Guideline for involving visual and aesthetic specialists in Environmental Impact Assessment (EIA) processes is provided in terms of southern African best practice in Visual Impact Assessment. The report compiled by Oberholzer states that the Best Practicable Environmental Option (BPEO) should address the following:

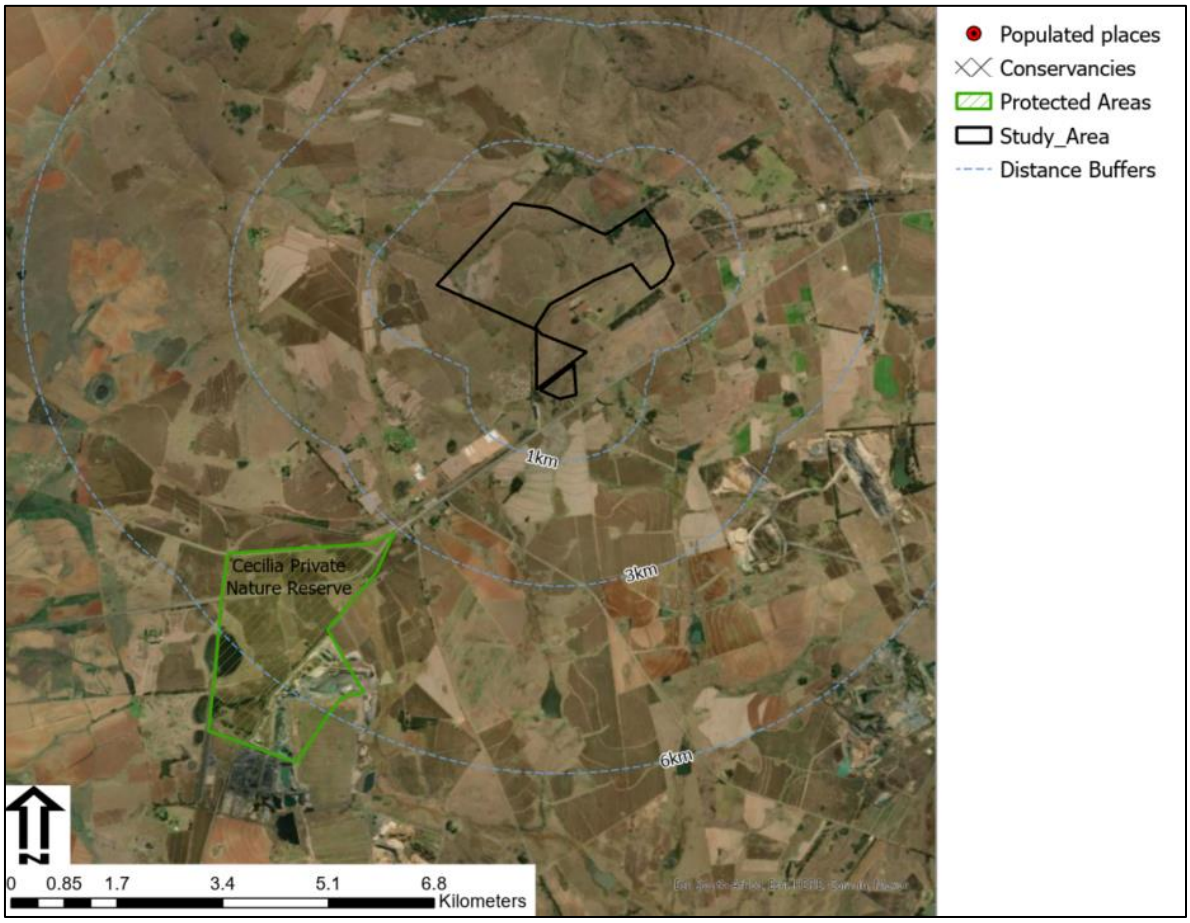
- Ensure that the scale, density and nature of activities or developments are harmonious and in keeping with the sense of place and character of the area. The BPEO must also ensure that development must be located to prevent structures from being a visual intrusion (i.e., to retain open views and vistas).
- Long term protection of important scenic resources and heritage sites.
- Minimisation of visual intrusion in scenic areas.
- Retention of wilderness or special areas intact as far as possible.
- Responsiveness to the area's uniqueness, or sense of place." (Oberholzer, 2005)

5.2.2 REDZ Planning

A Strategic Environmental Assessment commissioned by the Department of Environmental Affairs, undertaken by the CSIR, identified Renewable Energy Development Zones (REDZs) (Department of Environment Affairs). These are gazetted geographical areas in which several wind and solar PV development projects will have the lowest negative impact on the environment while yielding the highest possible social and economic benefit to the country. The project is situated in Emalahleni REDZ 9 (Phase 2) identified as being strategic for the deployment of large-scale solar photovoltaic (PV) energy facilities.

5.2.3 Nature Conservation Planning.

The proposed development is situated near the Cecilia Nederwalt, Langkloof and Ermelo Private Nature Reserves, Nooitgedacht Dam Nature Reserve and Greater Lakenvlei Protected Environment. As depicted in the map below, the only defined conservation area within the visual context of the proposed development is the Cecillia Private Nature Reserve.



5.2.4 Tourism Planning

While the tourist economy is strongly emphasised in planning documents due to the significance of Mpumalanga as an international tourist destination, a desktop study and the site visit found no close proximity tourist related activities. This is likely due to the semi-degraded landscape context of this section of the N4 Highway, as well as the relative proximity of the numerous coal mining activities in the region.

5.2.5 Other Renewable Energy Projects

A mapping exercise using the DEA Renewable Energy project listing database found that no other RE projects are located within 20km of the proposed PV project. Due to the undulation of the terrain, these other RE development would not fall within the proposed PV project Zone of Visual Influence.

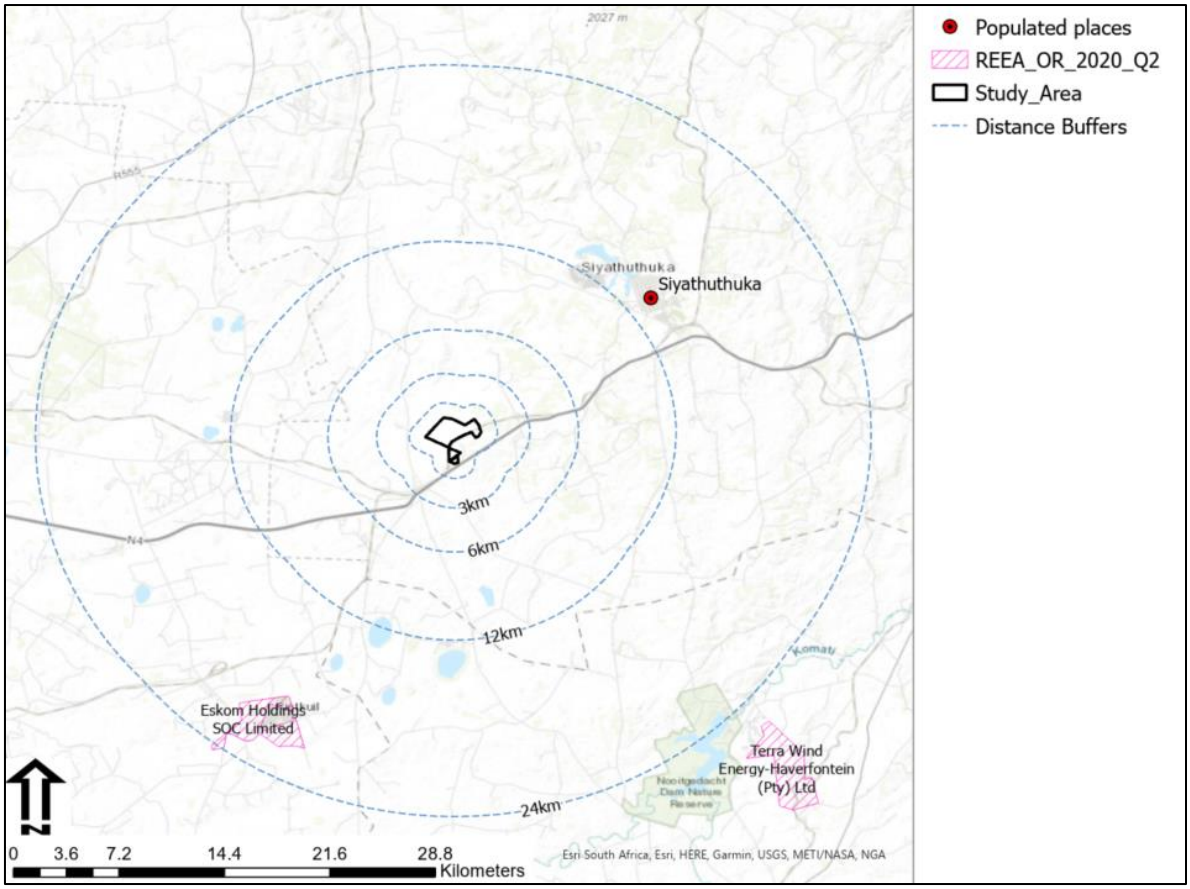


Figure 7: Map depicting DEA Renewable Energy project status.

5.2.6 Local and Regional Planning

The following tables list key regional and local planning that has relevance to the project pertaining to landscape-based tourism, and renewable energy projects.

Table 11: District Planning reference table relevant to the project.

Theme	Requirements	Page
Renewable Energy	In promoting environmental sustainability, the NDM has realized the need to explore other energy forms, which are renewable, beyond focusing on coal-generated electricity as the main supply of energy.	154
Tourism	• Belfast which has the opportunity to serve as a tourism gateway, due to the fact that tourists underway to the Kruger National Park along the N4 or Dullstroom/Pilgrim's Rest/Hoedspruit along the R540 (P81-1) have to travel through Belfast. This centre could therefore be used to promote the tourism opportunities in the Tourism Belt and the entire District. • The eastern regions (Emakazeni Municipality) of the Nkangala District already offer a variety of tourism opportunities associated with the scenic qualities, wetlands and conservation areas. A large part of the Emakhazeni Municipality forms part of the Tour Triangle, an area designated for tourism facilities associated with fly-fishing as part of the N4 Maputo Corridor initiative. This Tourism Belt incorporates sensitive wetlands and conservation areas, nature reserves and some of the proposed ecological	75

Theme	Requirements	Page
	corridors in the District, and according to the SDF the protection of these areas should be of high priority as part of the concept.	

(Nkangala District Municipality, 2012)

Table 12: Local Planning reference table relevant to the project.

Theme	Requirements	Page
Renewable Energy	Strategic Objective 3: Encourage sustainable resource use by exploring the most energy alternative technologies, designs, layouts, topography, etc. in order to achieve - and cost-effective development.	22
	Importantly, there is a growing urgency to establish an equitable and realistic trade-off that maximizes the provincial benefits from mining and energy sectors namely to the west of eMakhazeini (Belfast) in the south of the municipal area.	48
Tourism	Principle 1: Enhance Nature Conservation, Eco-tourism and Agriculture … the eastern part of the Emakhazeni area is earmarked for eco-tourism and agricultural uses and it also includes the so called “Trout Triangle” of the municipality as the tourism core.	85
Landscape	Planning and zoning developments spatially within protected areas to ensure an integrated approach between conservation and development and to maintain the integrity of the biodiversity and cultural resources;	25
Landscape	Protect open spaces and conservation areas in support of tourism drivers in Emakhazeni; Demarcate urban growth areas and in order to protect high potential Agricultural land	81
	Development of tourism facilities in this triangle should preferably be in line with the following guidelines, also mentioned above: • Ability to provide adequate infrastructure services to the developments; • Environmental protection and conservation; • Protection of the rural character and scenic qualities of the area	87
Economy	The District’s transportation network plays a key role in facilitating and maintaining the mining/ energy and export orientated manufacturing linkages (corridors) found between these regions.	14
	The following main economic sectors have been identified as key to spur in Mpumalanga (also in prominent in the space economy of Emakhazeni Local Municipality. • Agriculture • Mining and energy. • Manufacturing and beneficiation. • Tourism and cultural industries	19
	Regional Industrial Development strategy (RIDS): Municipal-wide focus on energy generation, mining, agriculture and tourism development.	27

(Emakhazeni Local Municipality, 2015)

5.3 Landscape Planning Policy Fit

Policy fit refers to the degree to which the proposed landscape modifications align with International, National, Provincial and Local planning and policy. In terms of *international best practice*, the proposed landscape modification will not trigger any issues as there are no significant landscape/ cultural landscape features within the project area there were no significant cultural/ landscape visual resources found on the site or immediate surrounds that are flagged by international landscape guidelines.

In terms of the local and regional planning, while renewable energy (RE) development is encouraged, the importance of tourism is also highlighted. The main aspect that needs to be taken into consideration is the N4 Highway, as this is an important tourist view corridor accessing the eastern conservation areas and parks. As the project is unlikely to impact existing conservation areas of the Cecilia PNR, and no active tourism destinations were identified within local vicinity, the impact to local planning is likely to be Positive. The area is also located within the Emalahleni REDZ 9. The main risk to the planning pertains to the rural agrarian landscape of that does add value to the local and regional scenic quality. **In terms of regional and local planning fit for planned landscape and visual related themes, the expected visual/ landscape policy fit of the landscape change is rated Medium to High Positive.**

6 BASELINE VISUAL INVENTORY

Landscape character is defined by the U.K. Institute of Environmental Management and Assessment (IEMA) as the 'distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and how this is perceived by people. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement'. It creates the specific sense of place or essential character and 'spirit of the place' (IEMA, 2002). This section of the VIA identified the main landscape features that define the landscape character, as well as the key receptors that make use of the visual resources created by the landscape.

6.1 Local Landscape Context

Land use is a crucial factor in determining landscape character, especially regarding the Visual Absorption Capacity (VAC) of the landscapes. Oberholzer defines VAC as the potential of the landscape to conceal the proposed project (Oberholzer, 2005). i.e.

- High VAC – e.g., effective screening by topography / structures.
- Moderate VAC - e.g., partial screening by topography / structures.
- Low VAC - e.g., little screening by topography / structures.

General land uses of the area are described making use of Open-Source Mapping vector data, overlaid onto ArcGIS World Satellite Imagery.

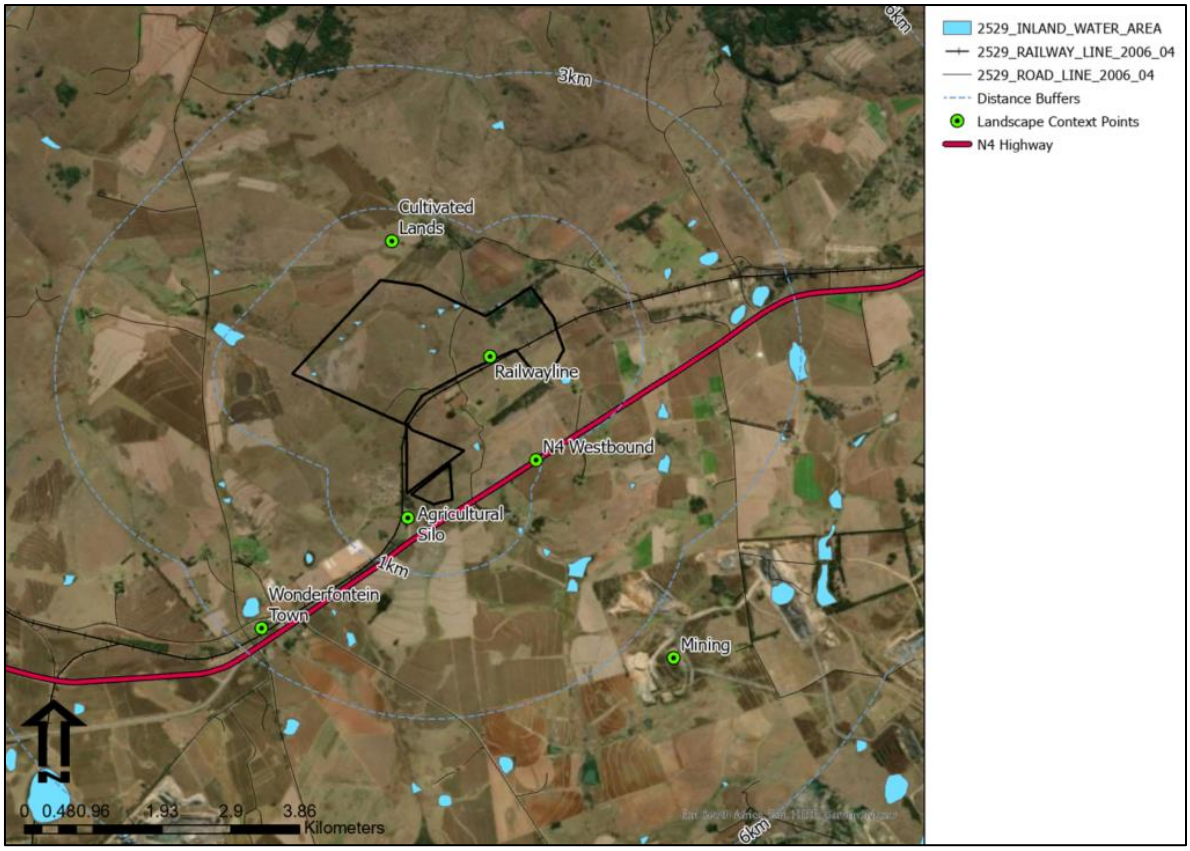


Figure 8. Local landscape themes map.

As mapped in Figure 8 above, the key landscape themes within the Foreground (3km approx.) distance are tabled below:

Table 13:Key Landscape Themes

Theme	Description
Railway line	A railway line is routed through the property, with associated embankments and OHL infrastructure.
Agricultural Silo	A large agriculture silo is located within the visual context of the project area, that defines the area as having a rural agricultural context, but also increases the VAC levels for the local area.
Mining	Three open cast type, coal related mines are located within a six kilometre distance. While within the local landscape context, these larger, transformed landscapes are located in the background and are not a dominating feature as seen from the study area.
N4 Westbound	The N4 Highway is located to the southeast of the study area, with clear visual proximity to the southern and eastern development areas. The infrastructure associated with the road does create a slightly degraded landscape context, without any clear vistas. This routing, however, is an important tourist view corridor and visually intrusive landscape changes should be limited.
Wonderfontein Town	Located to the south of the study area is the small town of Wonderfontein. The town is small in size and mainly relates to the

	silo, as well as the railway line station. The town is not a dominating feature in the landscape but does increase the local VAC levels as seen from the N4 receptors.
Rural dryline agrarian	The majority of the areas surrounding the study area are rural agricultural, with an agrarian focus on dryland maize farming intermixed with free range cattle farming. The cultivated fields, and isolated farmsteads add value to the local landscape context.

As the town and the silo, with infrastructure developments from the N4 Highway and the railway line do influence the local landscape context, the regional VAC level is rated Moderate.

6.1.1 Vegetation

Vegetation type is a large factor in determining the scenic quality or the site in terms of colour and texture, as well as influencing the local ability of the landscape to absorb the landscape change. The map below outlines the vegetation type based on BGIS mapping (South African National Biodiversity Institute, 2018).

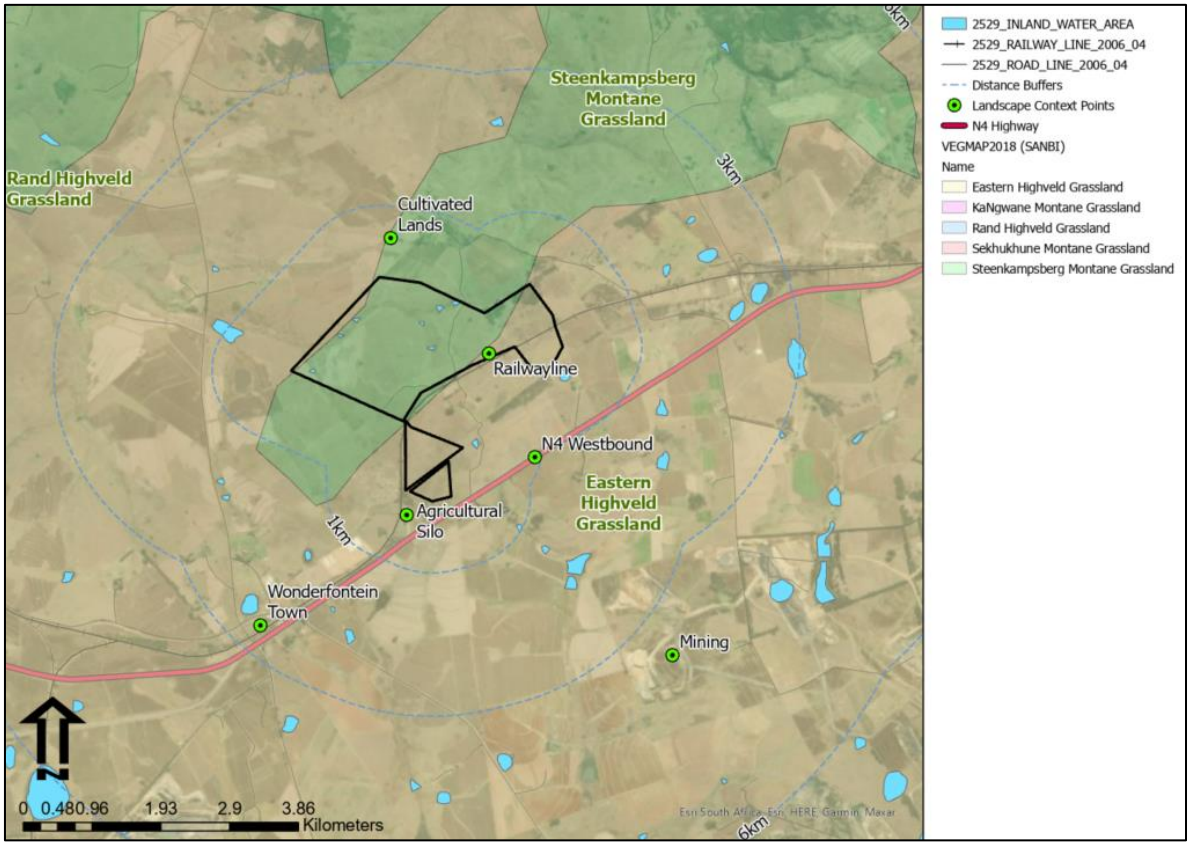


Figure 9. BGIS Vegetation Type Map (South African National Biodiversity Institute, 2018)

According to the South African National Biodiversity Institute (SANBI) 2012 Vegetation Map of South Africa, Lesotho and Swaziland (South African National Biodiversity Institute, 2012) the project area is located in the Grassland Biome with the main vegetation types being Steenkampsberg Montane Grassland for the north-western portion of the study area, and Eastern Highveld Grassland for the south-eastern sections. The grassland vegetation type

is aptly depicted in most of the photographs taken during the site survey (see Annexure A). Also depicted in the photos is alien vegetation, that is mainly located on the upper sections of the property, that partially detract from the grassland sense of place.

Of relevance to the project is that the grassland vegetation offers little vegetation screening, however, the alien vegetation does influence the views of the study area as seen from the N4 Highway. The north-eastern section of the study area would effectively be screened from surrounding, close proximity receptors should this vegetation be retained. As these trees are located on the proponent's property, the trees can be retained. Alien trees are also located along the railway line, with the trees screening close proximity views from the south-western agri-village.

6.2 Landscape Topography

Landform is a key variable informing the aesthetic nature of the landscape within the VRM methodology. The viewshed is strongly associated with the regional topography where topographic screening from undulating terrain would restrict views of the proposed landscape change. The site-specific characteristics are also analysed by gradient analysis to determine if any steep slopes are located on the proposed development site.

6.2.1 Regional Landscape Topography

Making use of the NASA STRM digital elevation model, profile lines were generated for the area within 12km on either side of the project area predominantly in the Norther to South and East to West compass reference but orientated to take into account dominant topographic trends that could influence the local landscape and viewscape. The map depicting the regional elevation profile lines can be viewed below.

The general topography of the region is defined as undulating, without dominating topographic features. The main topographic element is the elevated plateau located to the northeast of the site, with the study area falling on the southwestern extent of this high-ground area. This does have planning relevance as the topography is rated as Very-High Sensitivity by the DFFE Sensitivity Mapping tool. The proximity of the study area to the high ground is clearly depicted in both the West to East, and North to South Profiles. The NS profile shows the study area located off the upper ridgeline, with a north facing aspect and drainage. The WE Profile depicts the study area well off the elevated ridgeline, also with a dominant west facing aspect and drainage and with higher elevation that the lower western areas. The upper plateau is also more clearly pronounced on this profile, but also emphasising the undulation of this region.

In terms of visibility, due to the relative elevation, the viewshed would extend over a wider range, but only to the west as the eastern areas essentially fall on relatively flat terrain of the plateau or facing slightly to the west.

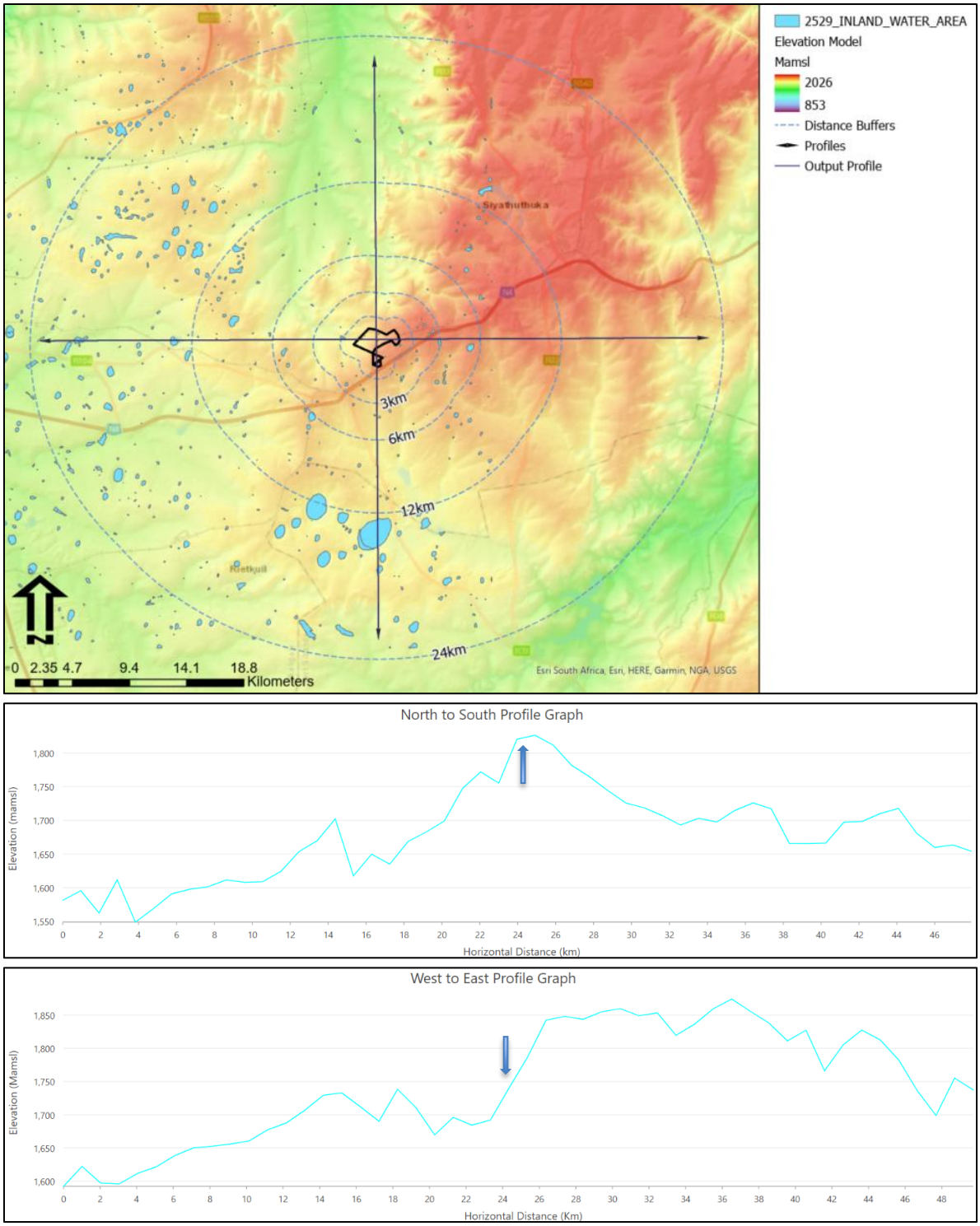


Figure 10: Regional Digital Elevation Mapping and Profiles Graphs *with approximate extent depicted*.

6.2.2 Key local topographic features and site slopes analysis

A slopes analysis making use of ASTER 30m DEM, found that there are some smaller patches of steep 1 in 4 slopes, with 1 in 10m slopes covering a larger area on a slope belt running from the southwest to the northeast (Figure 11**).** As this is highlighted in the DFFE SSV mapping overlay that was georeferenced onto the project locality Figure 12, these significant slope areas have been identified for exclusion from the proposed development footprint.

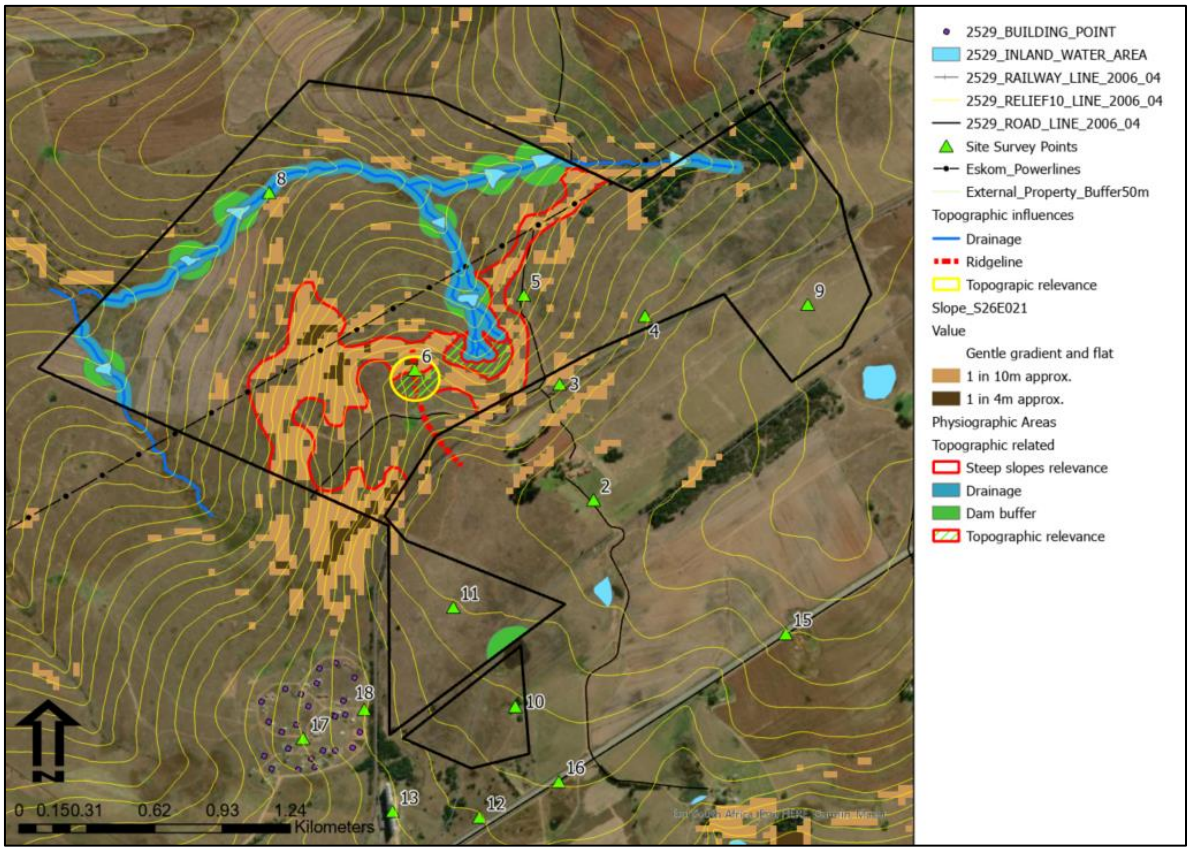


Figure 11: Key topographic features map.

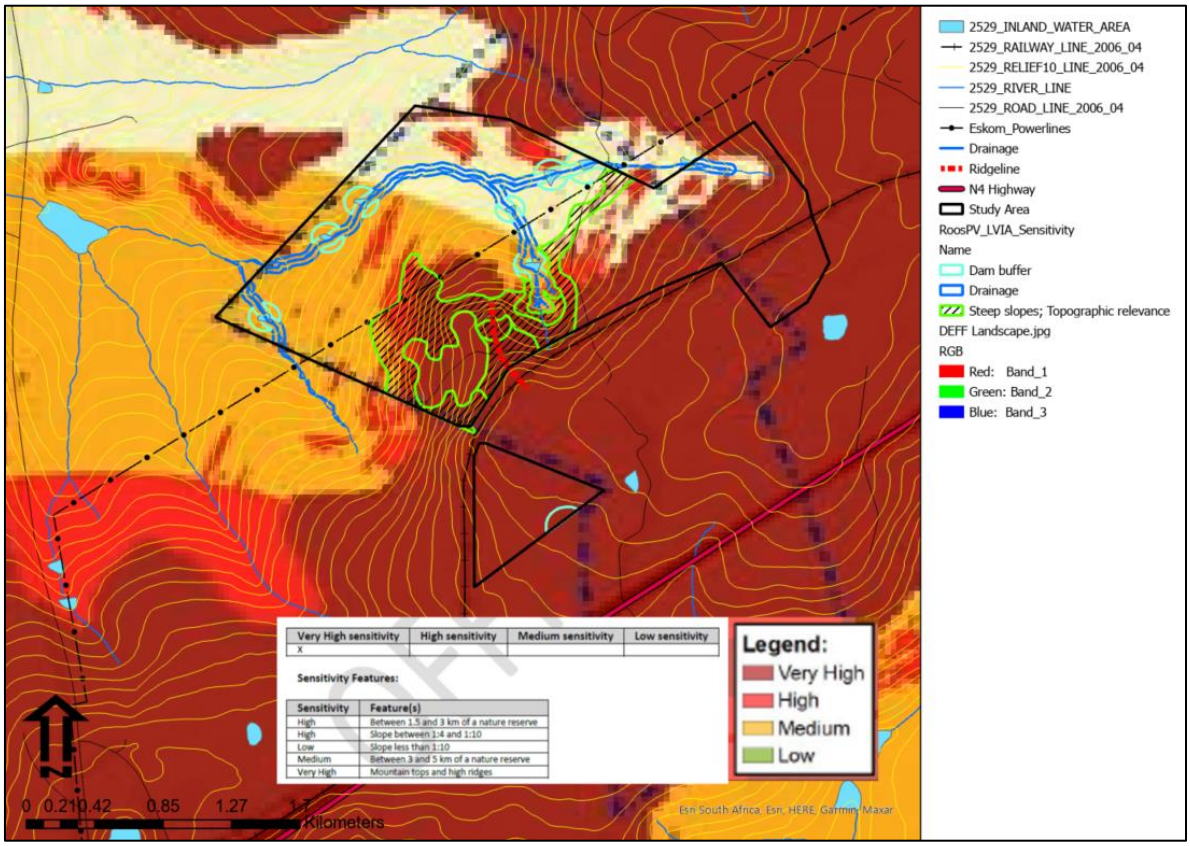


Figure 12: DFFE SSV topographic features map.

Due to the broad-brush analysis, only using a 30m DEM, the key steep slope areas were incorporated into a slope significance layer, where these slopes informed the larger Scenic Quality of the site. The smaller 1 in 10m slopes areas mapped, could be errors where the small area of the slope would not inform the larger landscape character. **Also of relevance to the site topographic scenic quality was a small, locally prominent ridgeline, as well as a small valley were a series of farm dams are enclosed by steep slopes creating an area of site specific landscape significance. As these areas overlap with the DEFF Landscape Risk Mapping, both these areas were defined as having topographic relevance and should be excluded from the development footprint. (*Note: The slopes analysis is approximate and is subject to detailed survey and detailed slopes analysis*)**

6.3 Project Zone of Visual Influence

The visible extent, or viewshed, is "the outer boundary defining a view catchment area, usually along crests and ridgelines" (Oberholzer, 2005). In order to define the extent of the possible influence of the proposed project, a viewshed analysis was undertaken from the proposed site at a specified height above ground level as indicated in the table below. This is to define the ***theoretical extent*** where the proposed landscape change could be visible from. This theoretical viewshed excludes vegetation, structural development as well as distance from the location where atmospheric influence would reduce visual clarity over increasing distance. The viewshed analysis makes use of open-source NASA ASTER Digital Elevation Model data (NASA, 2009).

The extent of the viewshed analysis was restricted to a defined distance that represents the approximate zone of visual influence (ZVI) of the proposed activities, which takes the scale, and size of the proposed projects into consideration in relation to the natural visual absorption capacity of the receiving environment. The maps are informative only as visibility tends to diminish exponentially with distance, which is well recognised in visual analysis literature (Hull & Bishop, 1988).

Based on the theoretical viewshed and the site visit appraisal of the nature of the landscape, an assessment of the ***Zone of Visual Influence (ZVI)*** is made. The ZVI is the area where the proposed landscape change is most likely to be noticed by the casual observer, taking the site visit into account where vegetation, existing development and distance is taken into consideration. This is a subjective appraisal but informed by the viewshed and the other factors mentioned.

6.3.1 Viewshed Analysis

A viewshed analysis was undertaken for the site making use of an Offset value representing the height of the proposed development was used to represent the approximate height of the proposed development as reflected in the table below. The viewshed was also capped at a defined extent to take atmospheric influences into consideration where the landscape change would not be clearly visible from. The height of 4m above ground level was chosen for the OV Offset above ground, with 1.5m being used to represent the height of the receptors (target). The viewshed extent was capped at 24km.

Table 14: Proposed Project Heights Table

Proposed Activity	Height (m)	Model Extent	Motivation
PV Structures	5m	24km	The undulation of the surrounding terrain in conjunction with atmospheric influences, is likely to contain the ZVI to the 24km distance at the outer extent.
LILO and Substation	30m	12km	Due to the small size of the structure and limited length of the LILO, the extent of the viewshed is highly unlikely to exceed 12km.

The PV viewshed is mapped and can be viewed in Figure 13 and on the next page, with the LILO/ Substation viewshed mapped in Figure 14. This depicts the theoretical area where the proposed landscape change could be visible. This theoretical viewshed excludes vegetation, structural development as well as distance from the location where atmospheric influence would reduce visual clarity over increasing distance. As a result of the similar topographic location of the PV Sites, a combined viewshed was generated. This is also to reflect the cumulative effect of the four PV sites viewed together. Individual viewsheds for the Preferred and Alternative LILO/ Substation locations were generated to reflect the different topographic location of these landscape changes.

The extent of the PV viewshed is defined as partially topographically contained, with limited views to the north, east and south, but extending up to the 24km distance in the northwest. While some limited extent views of the PV area would extend to the southwest around the town of Wonderfontein, but they would become topographically fragmented after the three-kilometre distance. Of relevance to the viewshed, is the location of the bulk of the PV areas in a small valley that would effectively limit clear views of the PV structures from receptors not having views into the valley. As such, there are no eastern receptors, even though some farmsteads are located in close proximity. Receptors included in the viewshed are listed as:

- Agri-Village.
- Wonderfontein Town.
- Western Rural Farmsteads.

The extent of the two LILO/ Substation landscape change depicts a similar spatial configuration as the PV due to the predominantly valley topography, but with less extent due to the smaller size and scale of the LILO/ Substation areas. The Preferred LILO/ Substation Option has a slightly larger viewshed as this locality is slightly less valley contained, with the Alternative LILO/ Substation Option located more in the valley, channelling the viewshed more directly west. As a result of the topographic variance, there is less visual exposure to receptors who are located more to the southwest along the N4 Highway. The Preferred LILO/ Substation Option receptors include:

- Agri-Village.
- Wonderfontein Town.
- Western Rural Farmsteads.

The Alternative LILO/ Substation Option receptors include:

- Western Rural Farmsteads.

The Zone of Visual Influence (ZVI) is the area where the proposed landscape change is most likely to be noticed by the casual observer, taking the site visit into account where vegetation, existing development and distance is taken into consideration. This is a subjective appraisal but informed by the viewshed and the other factors mentioned.

With regards to the proposed PV development (combined views), **the expected ZVI is likely to be contained to the Local Region influence and contained to the 6km to 12km distance zone. This is due to relatively higher elevation of the sites with regards to the lower lying lands to the west, but also depicting relatively constrained views to the north, east and south due to topographic screening.**

While there is some close proximity variance between the two LILO/ Substations viewsheds**, the overall extents are similar and are described as both having a Local Area influence and contained to the 6km distance range.**

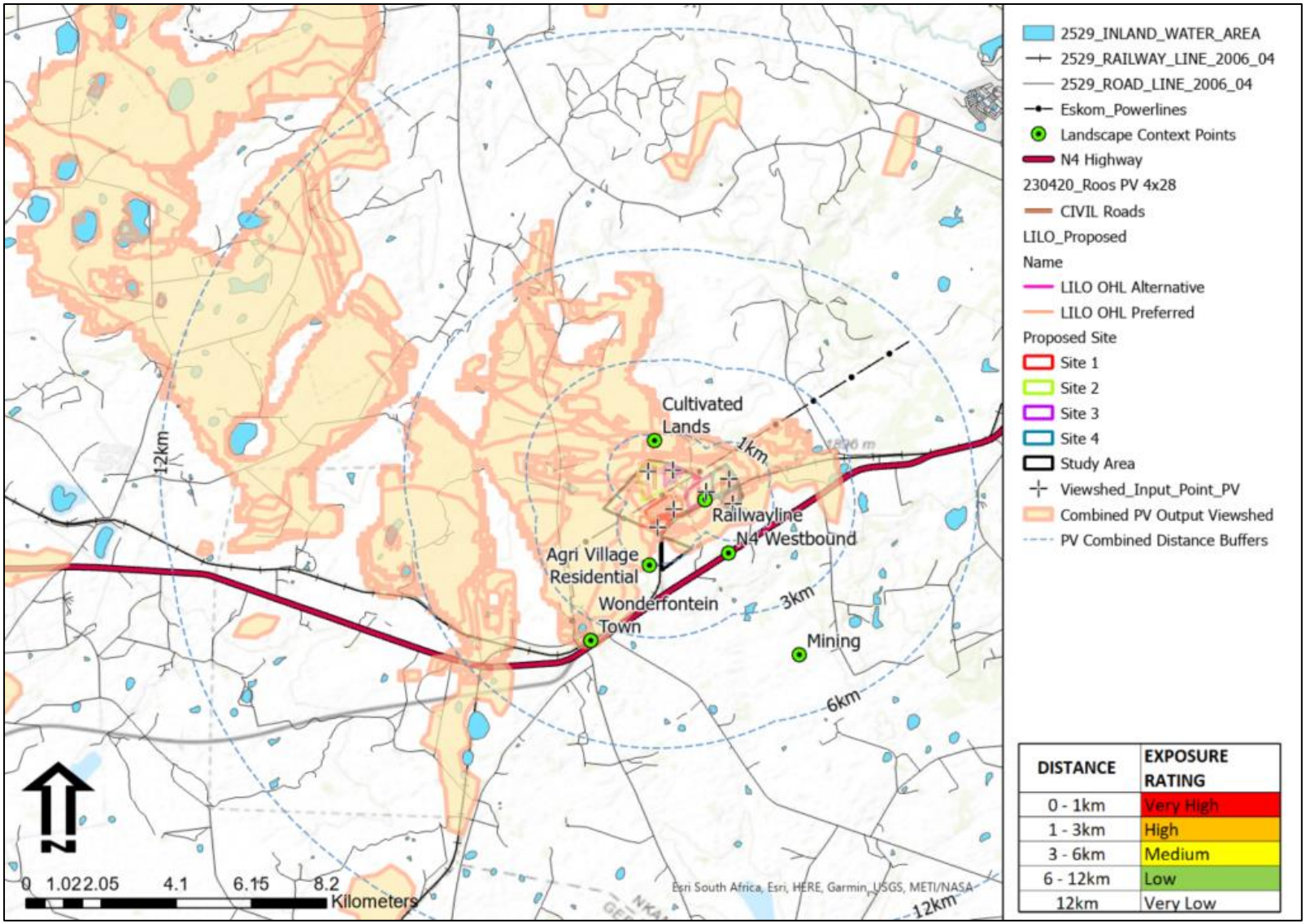


Figure 13: Viewshed analysis map of the combined proposed PV project for cumulative view effects.

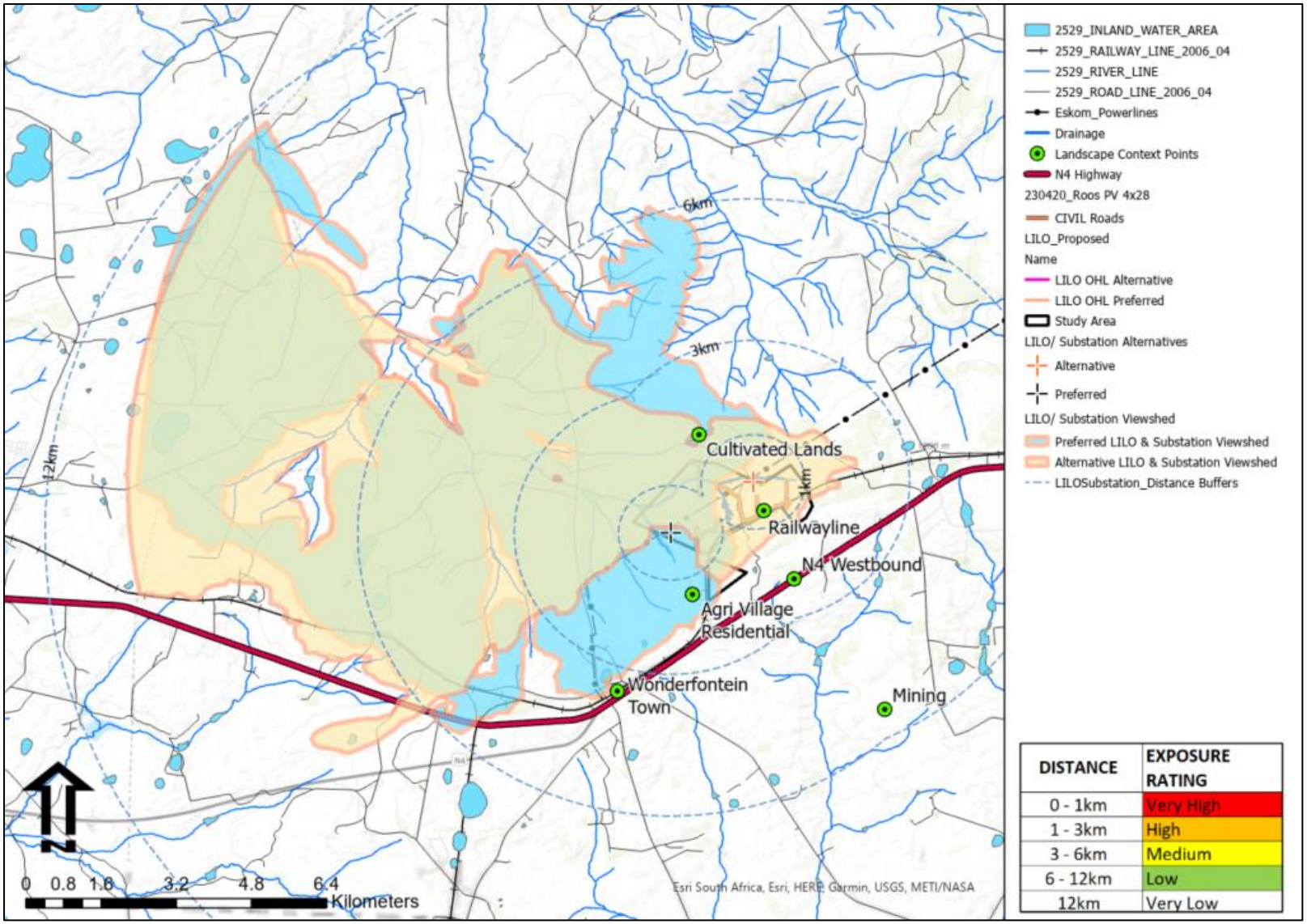


Figure 14: Viewshed analysis map of the Preferred LILO and Substation.

6.4 Receptors and Key Observation Points

As defined in the methodology, KOPs are defined by the Bureau of Land Management as the people (receptors) located in strategic locations surrounding the property that make consistent use of the views associated with the site where the landscape modifications are proposed. The following table identifies the receptors identified within the ZVI, as well as motivates if they have significance and should be defined as KOP. The receptors located within the ZVI, and KOPs view lines are indicated on the map on the following page. As motivated and mapped in Table 15 below and mapped on the previous page, the following receptors have been identified as Key Observation Points and should be used as locations to assess the suitability of the landscape change.

Table 15: KOP Motivation Table.

Name	Theme	Exposure	Motivation
PV Development			
Agri village	Agri-village	Very High	A small Agri-village is located in close proximity to the southwestern portion of the development with partial views of the PV landscape change.
Eastern Rural and Wonderfontein Town	Rural residential	Medium	The eastern area in the midground to background distance, comprises of cultivated farming areas where the remaining rural sense is likely to have value.
AlternativeLILO/ Substation Development			
Agri village	Agri-village	Very High	A small Agri-village is located in close proximity to the southwestern portion of the development with partial views of the PV landscape change.
Eastern Rural	Rural residential	Medium	The eastern area in the midground to background distance, comprises of cultivated farming areas were the remaining rural sense is likely to have value.
Preferred LILO/ Substation Development			
Eastern Rural	Rural residential	Medium	The eastern area in the midground to background distance, comprises of cultivated farming areas were the remaining rural sense is likely to have value.

Due to the close proximity of the receptors to the proposed **PV landscape change, the Visual Exposure of both the PV and LILO/ Substation projects is rated High.**

7 VISUAL RESOURCE MANAGEMENT

In terms of the VRM methodology, landscape character is derived from a combination of scenic quality, receptor sensitivity to landscape change, and distance of the proposed landscape modification from key receptor points. Making use of the key landscape elements defined in the landscape contextualisation sections above, landscape units are defined which are then rated to derive their intrinsic scenic value, as well as how sensitive people living in the area would be to changes taking place in these landscapes.

7.1 Physiographic Rating Units

The Physiographic Rating Units are the areas within the proposed development area that reflect specific physical and graphic elements that define a particular landscape character. These unique landscapes within the project development areas are rated to assess the scenic quality and receptor sensitivity to landscape change, which is then used to define a Visual Resource Management Class for each of the site's unique landscape/s. The exception is Class I, which is determined based on national and international policy / best practice and landscape significance and as such are not rated for scenic quality and receptor sensitivity to landscape change. Based on the SANBI vegetation mapping and the site visit to define key landscape features, the following broad-brush areas were tabled and mapped in Figure 15 below.

Table 16: Physiographic Landscape Rating Units.

Name	Sensitivity	
Dam buffer	High	The dams and drainage lines significantly add to the local landscape character (subject to Surface Water Hydrologist findings)
Drainage	High	
Steep slopes	High	1 in 4 and 1 in 10m slopes were identified on the slope. As this aligns with the DFFE SSV findings, these areas need to be recognised as having local landscape sensitivity.
Settlement buffer	Medium to High	Three small labour dwellings are located on the southwestern portion of the proposed PV area. A 50m buffer was excluded from the development area (subject to SIA findings)
Undulating grasslands	Medium	The majority of the area comprises of undulating grasslands that add some value to the regional landscape, but are not locally significant in terms of landscape.
Topographic relevance	Medium to High	A small ridgeline with local prominence, as well as a small steep sided valley, were found to have local landscape significance.
Transformed	Low	Transformed areas that include roads (unmapped) as well as the railway line corridor.

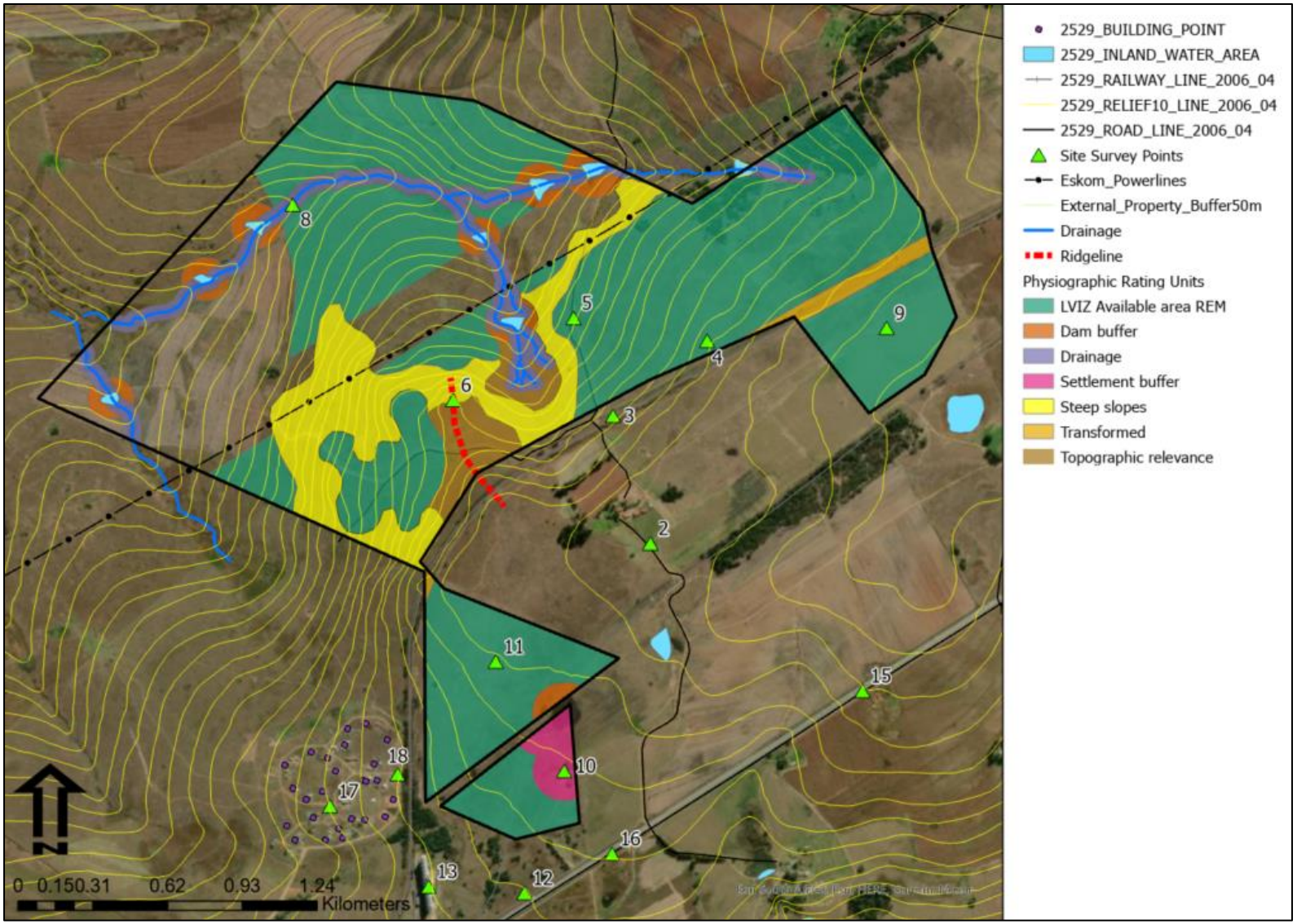


Figure 15: Physiographic Rating Units identified within the defined study area.

Table 17: Scenic Quality and Receptor Sensitivity Rating.

Landscape Rating Units	**Scenic Quality**									**Receptor Sensitivity**						**VRM**	
	A= scenic quality rating of ≥19; B = rating of 12 – 18, C= rating of ≤11									H = High; M = Medium; L = Low							
Attribute	**Landform**	**Vegetation**	**Water**	**Colour**	**Scarcity**	**Adjacent Landscape**	**Cultural Modifications**	**Sum**	**Rating**	**Type of Users**	**Amount of Use**	**Public Interest**	**Adjacent Land Uses**	**Special Areas**	**Rating**	**Inventory Class**	**Management Class**
Significant Heritage / Ecological / Hydrology. Steep slopes, Settlement buffer (50m)	**(Class I is not rated)**																**I**
Undulating grasslands	3	2	1	2	2	3	+2	**15**	**B**	M	L	L	L	M	**ML**	**III**	**III**
Topographic relevance	3	2	2	2	2	3	+2	**16**	**B**	M	L	L	L	M	**ML**	**III**	**II**
Transformed	1	1	0	1	1	1	-2	**3**	**C**	L	L	L	L	L	**L**	**IV**	**IV**

Red colour indicates change in rating from Visual Inventory to Visual Resource Management Classes motivated in the following section.

The ***Scenic Quality*** scores are totalled and assigned an A (High scenic quality), B (Moderate scenic quality) or C (Low scenic quality) category based on the following split: *A= scenic quality rating of ≥19; B = rating of 12 – 18, C= rating of ≤11* (USDI., 2004).
Receptor Sensitivity levels are a measure of public concern for scenic quality. Receptor sensitivity to landscape change is determined by rating the key factors relating to the perception of landscape change in terms of Low to High.

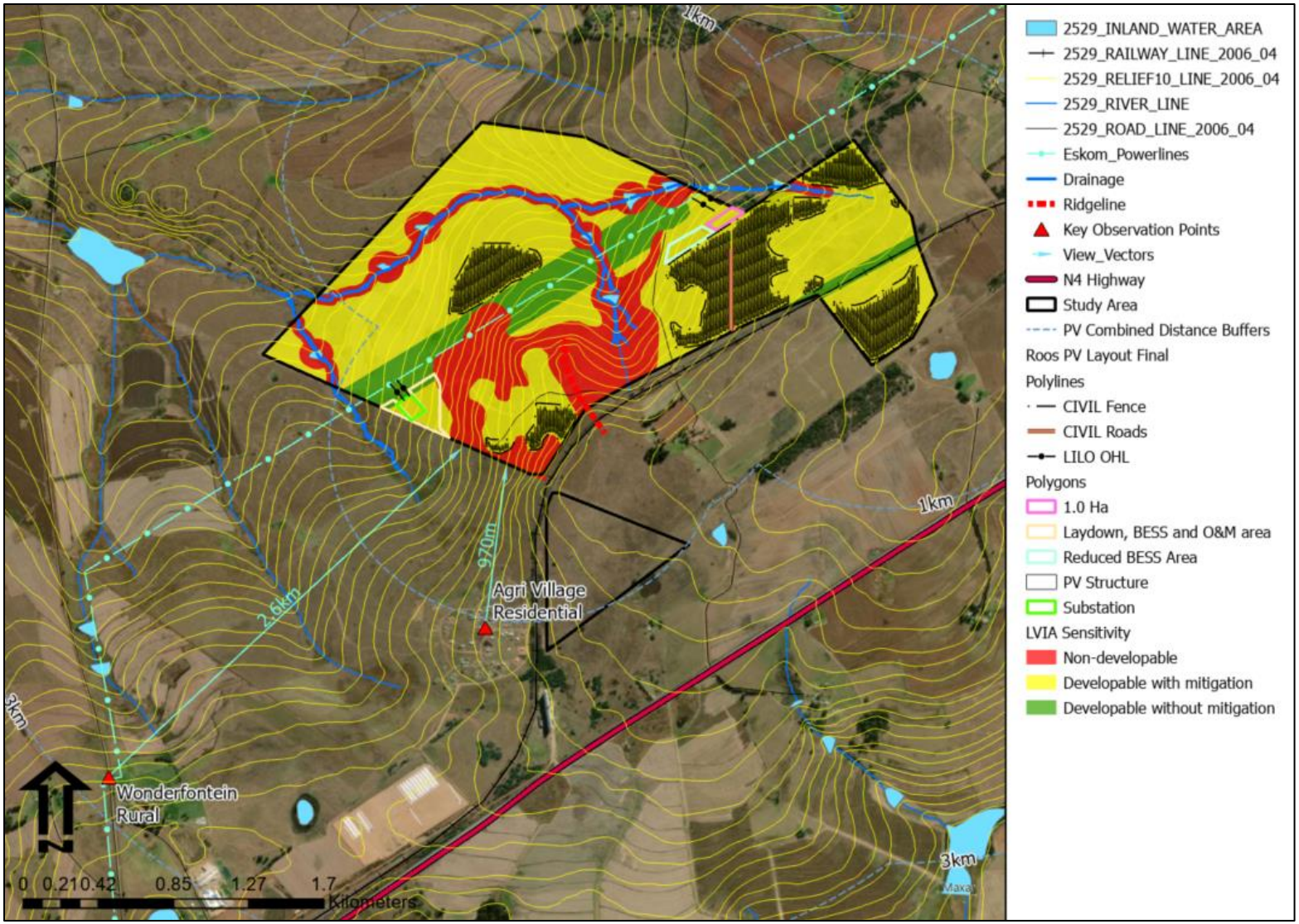


Figure 16: Visual Resource Management Classes and Key Observation Points map.

7.2 Scenic Quality Assessment

The scenic quality of the proposed development site is rated Medium. Landform is rated Medium to Low, as while there are steep slopes that do add local scenic quality, they are not topographically significant. The grassland vegetation depicts some variety, buy only one of two major types. Water is apparent in the landscape in the form of a series of small farm dams linked by the two small drainage lines. These features add to the site landscape character. Colours are predominantly grassland related, with khaki browns being the dominant colour. The adjacent scenery is dominated by undulating grassland, and moderately enhances the overall visual quality. Scarcity is rated Medium as the local landscape is distinctive, though somewhat similar to the others within the region.

7.3 Receptor Sensitivity Assessment

Receptor sensitivity to landscape changes is rated Medium to Low. In terms of the Type of Users, maintenance of visual quality is rated a moderate concern for most users as the area is of moderate scenic quality, and not located in a dominant visual position in the landscape. The southern portions of the proposed development areas are located in close proximity to residential receptors, where the amount of use is rated as Moderate for most users. Public Interest in maintenance of visual quality is rated Medium as while there are no tourist related activities located within the ZVI, the area is rural agricultural where rural residents could be sensitive to non-agricultural landscape change. Other than the two small topographic features and the drainage lines and associated dams and steep slopes, no Special Areas were identified within the study area.

7.4 Visual Resource Management (VRM) Classes

The BLM has defined four Classes that represent the relative value of the visual resources of an area and are defined in terms of the VRM Matrix as follows:

i. **Classes I and II** are the most valued.
ii. **Class III** represent a moderate value.
iii. **Class IV** is of least value.

7.4.1 VRM Class I

Class I is assigned when legislation restricts development in certain areas. The visual objective is to preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention. A Class I visual objective was assigned to the following features within the proposed development area due to their protected status within the South African legislation:

- **Any river / streams and associated flood lines buffers identified as significant in terms of the WULA process.**
- **Any wetlands identified as significant in terms of the WULA process.**
- **Any ecological areas (or plant species) identified as having a high significance.**
- **Any heritage area identified as having a high significance.**
- **As highlighted by the DEFF Landscape risk mapping, steep slopes should be avoided.**

To ensure landscape integrity, the above areas are defined as not suitable for development.

7.4.2 VRM Class II

The Class II objective is to retain the existing character of the landscape and the level of change to the characteristic landscape should be low. The proposed development may be seen but should not attract the attention of the casual observer, and should repeat the basic elements of form, line, colour and texture found in the predominant natural features of the characteristic landscape.

- **Not applicable.**

No VRM Class II areas were defined on the site.

7.4.3 VRM Class III

The Class III objective is to partially retain the existing character of the landscape, where the level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer, and changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The following landscape was defined as having Class III Visual Objectives where development would be most suitable:

- **Moderate Slope Undulating Grasslands.**

Suitable for development with mitigation as landscape resources are Moderate and are not currently being used as a visual resource.

7.4.4 VRM Class IV

The Class IV objective is to provide for management activities that require major modifications of the existing character of the landscape. The level of change to the landscape can be high, and the proposed development may dominate the view and be the major focus of the viewer's (s') attention without significantly degrading the local landscape character. Due to the degraded sense of place, the following areas were rated Class IV:

- **Transformed (railway line)**

This area is excluded from the development footprint but does negatively influence the local sense of place to some degree, increase the VAC levels for similar development.

8 VISUAL IMPACT ASSESSMENT

Impacts are defined in terms of the standardised impact assessment criteria provided by the environmental practitioner. Using the defined impact assessment criteria, the potential environmental impacts identified for the project were evaluated according to severity, duration, extent and significance of the impact. The potential occurrence and cumulative impact (as defined in the methodology) was also assessed. In order to better understand the nature of the severity of the visual impacts, a Contrast Rating exercise was undertaken.

8.1 Key Observation Point Contrast Rating and Photomontages

As indicated in the methodology, a contrast rating is undertaken to determine if the VRM Class Objectives are met. The suitability of a landscape modification is assessed by comparing and contrasting the existing receiving landscape to the expected contrast that the proposed landscape change will generate. This is done by evaluating the level of change to the existing landscape by assessing the line, colour, texture and form, in relation to the visual objectives defined for the area.

The following criteria are utilised in defining the degree of contrast (DoC):

- **None**: The element contrast is not visible or perceived.
- **Weak**: The element contrast can be seen but does not attract attention.
- **Moderate**: The element contrast begins to attract attention and begins to dominate the characteristic landscape.
- **Strong**: The element contrast demands attention, will not be overlooked, and is dominant in the landscape.

8.1.1 PV Development

The main receptors to the combined views of the four sites are essentially located to the west of the site and would be predominantly the rural receptors north of the town of Wonderfontein, and all located in Mid-ground distances with Medium to Low Visual Exposure. Massing effects of the combined views are reduced by the undulating site topography, with much of the PV areas located in shallow valley within the study area, with a small pocket of PV located on a flat area of medium prominence where the receptors located on predominantly low elevation would have limited view of large area PV panels. The location of the existing power line corridor through the project is another factor reducing massing effects, where the sites are split by the 200m gap of the servitude. Without mitigation, the Combined Site DoC is defined as Moderate, as the element contrast begins to attract attention and begins to dominate the characteristic landscape. With mitigation, the expected DoC can be reduced to Medium to Low with wind blown dust management as well as erosion management on the moderately steep areas.

8.1.2 Preferred LILO/ Substation, BESS, Laydown and O&M.

The Preferred LILO/ Substation is located to the southwest of the site, in a low prominence location in a wider valley that opens up to the northwest. As indicated in the viewshed analysis, the two main KOPs are the agri-village located 1.1km to the south on elevated terrain, and the western rural agricultural receptors and Wonderfontein Town receptors located approximately three kilometres, also to the southwest. Due to the lower prominence and the agriculturally transformed lands, the area where the LILO, Substation (and BESS and laydown) are located

on VRM Class III areas, where moderate levels of landscape change would be acceptable. The moderation of the scenic quality of this area is also negatively influenced by the adjacent powerline routing and corridor where future powerline routings are likely to be located. Viewed against the existing powerline infrastructure, the additional LILO infrastructure is likely to generate lower levels of visual contrast due to the existing vertical line elements in the landscape increasing the VAC levels. **As seen from the Agri-village, the DoC is likely to be Weak for Form and Line but would be Medium for Colour and Texture change. Given the close proximity of the powerline already degrading the landscape character to some degree, no contrast reducing mitigations would be required.**

8.1.3 Alternative LILO/ Substation BESS, Laydown and O&M.

The Alternative LILO/ Substation is located to the southwest of PV Site, in a relatively low prominence location in a narrow valley that opens up to the northwest. As indicated in the viewshed analysis, the main KOPs are the western rural agricultural receptors located in Medium to Low Visual Exposure areas further than four kilometres distance. Due to the possibility of steeper slopes to the north of the proposed substation site, this area has been defined as Class I where development is not recommended. This slopes analysis is however, based on course 30m DEM data and the resultant steep slope area representing a possible narrow band of the slope. As such, a detailed survey and refined slopes analysis would be required to define the setback. **As this area is Seldom Seen with very limited receptor visibility, the expected landscape change is unlikely to degrade the VRM Class III areas defined for the majority of the site. As seen from the background rural agricultural receptors, the DoC is likely to be Weak/ None.**

8.2 SiVEST Impact Assessment for Landscape Resources

The following visual impacts could take place during the lifetime of the ***proposed*** PV Solar Facility project:

Construction:

- Loss of site landscape character due to the removal of vegetation and the construction of the PV structures and associated infrastructure.
- Wind-blown dust due to the removal of large areas of vegetation.
- Possible soil erosion from temporary roads crossing drainage lines.
- Wind-blown litter from the laydown and construction sites.

Operation:

- Massing effect in the landscape from a large-scale modification.
- On-going soil erosion.
- On-going windblown dust.

Decommissioning:

- Movement of vehicles and associated dust.
- Wind-blown dust from the disturbance of cover vegetation / gravel.

Cumulative:

- A long-term change in land use setting a precedent for other similar types of solar energy projects.

8.2.1 Roos PV Project

ROOS SOLAR FACILITY																				
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 (+ OR -)**	**S**		**E**	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**
Construction Phase																				
Loss of Landscape Resources	Drainage lines and wetland features are located on the site that are a key factor that define the local landscape resources. As these areas are excluded, the rural agrarian landscape integrity is retained.	1	3	2	2	3	3	33	-	Medium	Some steeper areas (less than 1 in 10m) are used for PV development and soil erosion management on these areas is important.	1	3	2	2	3	2	22	-	Low
Wind blown dust	Windblown dust and dust from moving vehicles have the potential to become a significant nuisance factor to local farms around the site and along the access road.	1	4	1	2	1	2	18	-	Low	Should excessive dust be generated from the movement of vehicles on the roads such that the dust becomes visible to the immediate surrounds, dust-retardant measures should be implemented under authorisation of the EPC.	1	2	1	1	1	1	6	-	Low

Dust from moving vehicles	Windblown dust and dust from moving vehicles have the potential to become a significant nuisance factor to local farms around the site.	2	4	2	2	1	3	33	-	Medium	Should excessive dust be generated from the movement of vehicles on the roads such that the dust becomes visible to the immediate surrounds, dust-retardant measures should be implemented under authorisation of the EPC.	2	2	1	2	1	1	8	-	Low
Buildings, structures and finishings	Buildings painted bright colours can increase the visual presence of the structures in a rural landscape, creating higher levels of visual contrast and attracting the attention of the causal observer.	1	3	1	2	1	2	16	-	Low	The buildings should be painted a grey-brown colour (or other colour in keeping with the surrounding landscape) to assist in reducing colour contrast. Sheet metal structures should make use of mid-grey colour, and preferable have a rough texture material.	1	2	1	1	1	1	6	-	Low
Litter	Litter has the potential to degrade landscape character and can be contained by fencing around the construction camp/ laydown.	1	2	1	2	1	1	7	-	Low	Littering should be a finable offence. Fencing around the laydown should be diamond shaped to catch wind blown litter. The fences should be routinely checked for the collection of litter caught on the fence.	1	1	1	1	1	1	5	-	Low
Fencing	Long fencing lines has the potential to be visually dominating, degrading the rural landscape sense of place.	1	3	2	2	3	2	22	-	Low	Fencing should be simple and appear transparent from a distance and located around the construction camp, not encircle the total project area.	1	1	1	1	1	1	5	-	Low

Security Light Spillage at night (See Annexure)	Light spillage from security lighting of structures can significantly increase the visual impact of a project in a rural landscape in a dark-sky context.	2	3	1	2	1	2	18	-	Low	Light spillage mitigation from security lighting should be implemented and monitored by the ECO during construction to ensure that light spillage does not create a glowing effect. No overhead/ flood lighting of structures or areas. No up lighting to be used.	1	2	1	1	1	1	6	-	Low
Un-necessary roads	Un-necessary roads have the potential to create a visual disturbance long after the usage as past.	1	2	2	2	2	2	18	-	Low	Limit road access to an efficient minimum by coordinated planning between the project management and the environmental control officer. Temporary roads should be well marked and should only cross drainage lines on areas identified as permanent road features where erosion and soil loss management can be contained. Noncompliance with road signage and utilisation of no authorised roads should become a finable offence.	1	1	1	1	1	1	5	-	Low
Operational Phase																				
Soil sterilisation by compaction	Compaction of larger areas can result in soil sterilisation and landscape degradation.	1	3	3	2	3	2	24	-	Low	Laydown areas and other construction areas no longer needed post construction for operational management, should be ripped (0.5m depth) to restore compacted topsoil, and then rehabilitated to natural vegetation under the supervision of the rehabilitation specialist.	1	2	2	2	2	1	9	-	Low

Security Light Spillage at night	Light spillage from security lighting of structures can significantly increase the visual impact of a project in a rural landscape in a dark-sky context.	3	3	1	2	1	2	20	-	Low	Light spillage mitigation from security lighting should be implemented and monitored by the ECO during operational phase to ensure that light spillage does not create a glowing effect. No overhead/ flood lighting of structures or areas. No up lighting to be used.	1	2	1	1	1	1	6	-	Low
Decommissioning Phase																				
Windblown dust and dust from moving vehicles	Windblown dust and dust from moving vehicles have the potential to become a significant nuisance factor to local farms around the site and along the access road.	2	3	2	2	1	3	30	-	Medium	Should excessive dust be generated from the movement of vehicles on the roads such that the dust becomes visible to the immediate surrounds, dust-retardant measures should be implemented under authorisation of the EPC.	2	2	1	2	1	1	8	-	Low
Abandoning of old structures	Old, unused structures have the potential to significantly degrade the landscape character.	2	2	2	3	3	3	36	-	Medium	All structures not required for agricultural purposes post-closure should be removed and where possible, recycled or reused. Building structures should be broken down (including building foundations).	1	2	2	2	1	1	8	-	Low
Cumulative																				

Intervisibility of other RE Projects	Intervisibility of the proposed project with surrounding PV projects could result in massing effects degrading landscape resources. No other RE projects are located in the ZVI with limited residential receptors in mainly Medium to Low Visual Exposure distances.	2	4	2	3	3	2	28	-	Low	Effective management of security lighting to ensure that a pool/ glow of light is not emitted from the collective projects (See Annexure). Exclusion of PV from steep slopes and from the ridgeline.	2	3	2	3	3	1	13	-	Low

8.2.2 Alternative LILO, Substation, BESS and Laydown.

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 (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Construction Phase																				
Loss of Landscape Resources	Moderate loss of landscape character due to existing rural farmlands in close proximity to the existing Eskom powerline and corridor where future powerline are most likely to be routed.	1	2	2	1	3	1	9	-	Low	Careful management of cut and fills to ensure that erosion does not take place and effective rehabilitation takes place post construction.	1	1	2	1	3	1	8	-	Low
Wind blown dust	Windblown dust and dust from moving vehicles have the potential to become a significant nuisance factor to local farms around the site and along the access road.	1	2	1	2	1	2	14	-	Low	Should excessive dust be generated from the movement of vehicles on the roads such that the dust becomes visible to the immediate surrounds, dust-retardant measures should be implemented under authorisation of the EPC.	1	2	1	1	1	1	6	-	Low
Dust from moving vehicles	Windblown dust and dust from moving vehicles have the potential to become a significant nuisance factor to local farms around the site.	2	2	2	2	1	3	27	-	Medium	Should excessive dust be generated from the movement of vehicles on the roads such that the dust becomes visible to the immediate surrounds, dust-retardant measures	2	2	1	2	1	1	8	-	Low

											should be implemented under authorisation of the EPC.									
Buildings, structures and finishings	Buildings painted bright colours can increase the visual presence of the structures in a rural landscape, creating higher levels of visual contrast and attracting the attention of the causal observer.	1	3	1	2	1	2	16	-	Low	The buildings should be painted a grey-brown colour (or other colour in keeping with the surrounding landscape) to assist in reducing colour contrast. Sheet metal structures should make use of mid-grey colour, and preferable have a rough texture material.	1	2	1	1	1	1	6	-	Low
Litter	Litter has the potential to degrade landscape character and can be contained by fencing around the construction camp/ laydown.	1	2	1	2	1	1	7	-	Low	Littering should be a finable offence. Fencing around the laydown should be diamond shaped to catch wind blown litter. The fences should be routinely checked for the collection of litter caught on the fence.	1	1	1	1	1	1	5	-	Low
Fencing	Long fencing lines has the potential to be visually dominating, degrading the rural landscape sense of place.	1	3	2	2	3	2	22	-	Low	Fencing should be simple and appear transparent from a distance and located around the construction camp, not encircle the total project area.	1	1	1	1	1	1	5	-	Low
Security Light Spillage at night (See Annexure)	Light spillage from security lighting of structures can significantly increase the visual impact of a project in a rural landscape in a dark-sky context.	2	3	1	2	1	2	18	-	Low	Light spillage mitigation from security lighting should be implemented and monitored by the ECO during construction to ensure that light spillage does not create a glowing effect. No overhead/ flood lighting of structures or areas. No up lighting to be used.	1	2	1	1	1	1	6	-	Low

Operational Phase																				
Soil sterilisation by compaction	Compaction of larger areas can result in soil sterilisation and landscape degradation.	1	3	3	2	3	2	24	-	Low	Laydown areas and other construction areas no longer needed post construction for operational management, should be ripped (0.5m depth) to restore compacted topsoil, and then rehabilitated to natural vegetation under the supervision of the rehabilitation specialist.	1	2	2	2	2	1	9	-	Low
Security Light Spillage at night	Light spillage from security lighting of structures can significantly increase the visual impact of a project in a rural landscape in a dark-sky context.	3	3	1	2	1	2	20	-	Low	Light spillage mitigation from security lighting should be implemented and monitored by the ECO during operational phase to ensure that light spillage does not create a glowing effect. No overhead/ flood lighting of structures or areas. No up lighting to be used.	1	2	1	1	1	1	6	-	Low
Decommissioning Phase																				
Windblown dust and dust from moving vehicles	Windblown dust and dust from moving vehicles have the potential to become a significant nuisance factor to local farms around the site and along the access road.	2	3	2	2	1	3	30	-	Medium	Should excessive dust be generated from the movement of vehicles on the roads such that the dust becomes visible to the immediate surrounds, dust-retardant measures should be implemented under authorisation of the EPC.	2	2	1	2	1	1	8	-	Low
Abandoning of old structures	Old, unused structures have the potential to significantly degrade the landscape character.	2	2	2	3	3	3	36	-	Medium	All structures not required for agricultural purposes post-closure should be removed and where possible, recycled or reused. Building structures should be broken down (including building foundations).	1	2	2	2	1	1	8	-	Low

Cumulative																				
Intervisibility of other RE Projects	Intervisibility of the proposed project with surrounding PV projects could result in massing effects degrading landscape resources. No other RE projects are located in the ZVI with limited residential receptors in mainly Medium to Low Visual Exposure distances.	2	3	2	3	3	2	26	-	Low	Effective management of security lighting to ensure that a pool/ glow of light is not emitted from the collective projects (See Annexure). Exclusion of PV from steep slopes and from the ridgeline.	2	3	2	3	3	1	13	-	Low

8.2.3 Preferred LILO, Substation, BESS and Laydown.

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 (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Construction Phase																				
Loss of Landscape Resources	Moderate loss of landscape character due to existing rural farmlands in close proximity to the existing Eskom powerline and corridor where future powerline are most likely to be routed. Increased probability of cut and fills due to proximity to steep slope areas.	1	3	2	1	3	2	20	-	Low	Exclusion of areas of steep slope (1 in 6m) subject to detailed site survey. Careful management of cut and fills to ensure that erosion does not take place and effective rehabilitation takes place post construction.	1	1	2	1	3	1	8	-	Low
Wind blown dust	Windblown dust and dust from moving vehicles have the potential to become a significant nuisance factor to local farms around the site and along the access road.	1	2	1	2	1	2	14	-	Low	Should excessive dust be generated from the movement of vehicles on the roads such that the dust becomes visible to the immediate surrounds, dust-retardant measures should be implemented under authorisation of the EPC.	1	2	1	1	1	1	6	-	Low

Dust from moving vehicles	Windblown dust and dust from moving vehicles have the potential to become a significant nuisance factor to local farms around the site.	2	2	2	2	1	3	27	-	Medium	Should excessive dust be generated from the movement of vehicles on the roads such that the dust becomes visible to the immediate surrounds, dust-retardant measures should be implemented under authorisation of the EPC.	2	2	1	2	1	1	8	-	Low
Buildings, structures and finishings	Buildings painted bright colours can increase the visual presence of the structures in a rural landscape, creating higher levels of visual contrast and attracting the attention of the causal observer.	1	3	1	2	1	2	16	-	Low	The buildings should be painted a grey-brown colour (or other colour in keeping with the surrounding landscape) to assist in reducing colour contrast. Sheet metal structures should make use of mid-grey colour, and preferable have a rough texture material.	1	2	1	1	1	1	6	-	Low
Litter	Litter has the potential to degrade landscape character and can be contained by fencing around the construction camp/ laydown.	1	2	1	2	1	1	7	-	Low	Littering should be a finable offence. Fencing around the laydown should be diamond shaped to catch wind blown litter. The fences should be routinely checked for the collection of litter caught on the fence.	1	1	1	1	1	1	5	-	Low
Fencing	Long fencing lines has the potential to be visually dominating, degrading the rural landscape sense of place.	1	3	2	2	3	2	22	-	Low	Fencing should be simple and appear transparent from a distance and located around the construction camp, not encircle the total project area.	1	1	1	1	1	1	5	-	Low
Security Light Spillage at night (See Annexure)	Light spillage from security lighting of structures can significantly increase the visual impact of a project in a rural landscape in a dark-sky context.	2	3	1	2	1	2	18	-	Low	Light spillage mitigation from security lighting should be implemented and monitored by the ECO during construction to ensure that light spillage does not create a glowing effect. No overhead/ flood lighting of structures or areas. No up lighting to be used.	1	2	1	1	1	1	6	-	Low

Operational Phase																				
Soil sterilisation by compaction	Compaction of larger areas can result in soil sterilisation and landscape degradation.	1	3	3	2	3	2	24	-	Low	Laydown areas and other construction areas no longer needed post construction for operational management, should be ripped (0.5m depth) to restore compacted topsoil, and then rehabilitated to natural vegetation under the supervision of the rehabilitation specialist.	1	2	2	2	2	1	9	-	Low
Security Light Spillage at night	Light spillage from security lighting of structures can significantly increase the visual impact of a project in a rural landscape in a dark-sky context.	3	3	1	2	1	2	20	-	Low	Light spillage mitigation from security lighting should be implemented and monitored by the ECO during operational phase to ensure that light spillage does not create a glowing effect. No overhead/ flood lighting of structures or areas. No up lighting to be used.	1	2	1	1	1	1	6	-	Low
Decommissioning Phase																				
Windblown dust and dust from moving vehicles	Windblown dust and dust from moving vehicles have the potential to become a significant nuisance factor to local farms around the site and along the access road.	2	3	2	2	1	3	30	-	Medium	Should excessive dust be generated from the movement of vehicles on the roads such that the dust becomes visible to the immediate surrounds, dust-retardant measures should be implemented under authorisation of the EPC.	2	2	1	2	1	1	8	-	Low
Abandoning of old structures	Old, unused structures have the potential to significantly degrade the landscape character.	2	2	2	3	3	3	36	-	Medium	All structures not required for agricultural purposes post-closure should be removed and where possible, recycled or reused. Building structures should be broken down (including building foundations).	1	2	2	2	1	1	8	-	Low

Cumulative																				
Intervisibility of other RE Projects	Intervisibility of the proposed project with surrounding PV projects could result in massing effects degrading landscape resources. No other RE projects are located in the ZVI with limited residential receptors in mainly Medium to Low Visual Exposure distances.	2	3	2	3	3	2	26	-	Low	Effective management of security lighting to ensure that a pool/ glow of light is not emitted from the collective projects (See Annexure). Exclusion of PV from steep slopes and from the ridgeline.	2	3	2	3	3	1	13	-	Low

9 ENVIRONMENTAL MANAGEMENT PLANNING – COMBINED PROJECTS

Table 18. Pre-Construction Phase EMP Table (Not applicable)

Table 19. Construction Phase EMP Table

Impact/ Aspect	**Mitigation/Management Actions**	***Responsibility***	***Methodology***	**Mitigation/Management Objectives and Outcomes**	***Frequency***
Topsoil loss can reduce the viability of rehabilitation measures and needs to be carefully managed if available.	• Topsoil excavated from the site should be stockpiled and utilised for rehabilitation of the site after construction.	Project management and EPC	As defined by the rehabilitation specialist.	Topsoil is utilized and no sterilization of topsoil takes place.	As required.
Un-necessary roads have the potential to create a	• Limit road access to an efficient minimum by coordinated planning	Project management and EPC	Temporary roads should be well marked and should only cross	The surrounding landscape remains rural	As required.

Impact/ Aspect	Mitigation/Management Actions	*Responsibility*	*Methodology*	Mitigation/Management Objectives and Outcomes	*Frequency*
visual disturbance long after the usage as past.	between the project management and the environmental control officer.		drainage lines on areas identified as permanent road features where erosion and soil loss management can be contained. Non-compliance with road signage and utilisation of no authorised roads should become a finable offence.	and agricultural in landscape and land use.	
Windblown dust and dust from moving vehicles have the potential to become a significant nuisance factor to local farms around the site and along the access road.	• Set up a clear management plan with clear accountability structures with set thresholds for triggering of mitigations. • Set up a liaison committee to engage with local farmsteads located within 500m of an access road, with monthly communication with the farm owners on the effectiveness of the dust management procedures.	Project management and EPC (as the issue arises).	Should excessive dust be generated from the movement of vehicles on the roads such that the dust becomes visible to the immediate surrounds, dust-retardant measures should be implemented under authorisation of the EPC.	Dust generated on site as well as on the access road to the site, is well managed and does not become a nuisance factor for the workers or the surrounding farmsteads.	On-going

Impact/ Aspect	Mitigation/Management Actions	*Responsibility*	*Methodology*	Mitigation/Management Objectives and Outcomes	*Frequency*
Buildings painted bright colours can increase the visual presence of the structures in a rural landscape, creating higher levels of visual contrast and attracting the attention of the casual observer. (BESS excluded)	• The buildings should be painted a grey-brown colour (or other colour in keeping with the surrounding landscape) to assist in reducing colour contrast. • Sheet metal structures should make use of mid-grey colour, and preferable have a rough texture material. • As BESS structure often require a white paint of containers to reduce heat risk to the batteries, the BESS is excluded from the colour mitigation. Risk to landscape is low due to limited visibility and low receptors exposure.	Project management and EPC	At the commencement of construction, purchase order criteria for ordering paints and sheet metals need to be clearly defined.	Colour contrast generated from the buildings as seen from the roads is low and does not attract the attention of the casual observer.	Commencement of construction.
Light spillage from security lighting of structures can significantly increase the visual impact of a project in a rural landscape in a dark-sky context.	• Light spillage mitigation from security lighting should be implemented and monitored by the ECO during construction to ensure that light spillage does not create a glowing effect.	Project management and EPC	At the commencement of construction, purchase order criteria for ordering of security lighting need to be clearly defined.	Lights contrast generated from the buildings as seen from the roads is low and does not attract the attention of the casual observer.	Commencement of construction.

Impact/ Aspect	Mitigation/Management Actions	*Responsibility*	*Methodology*	Mitigation/Management Objectives and Outcomes	*Frequency*
	• No overhead/ flood lighting of structures or areas. • No up lighting to be used.				
Litter has the potential to degrade landscape character and can be contained by fencing around the construction camp/ laydown.	• Littering should be a finable offence. • Fencing around the laydown should be diamond shaped to catch wind blown litter. The fences should be routinely checked for the collection of litter caught on the fence.	Project management and EPC	Littering rules need to be clearly defined and workers effectively informed of the consequences of littering.	Solid waste litter is effectively controlled and does not become a landscape degradation risk.	Checked bi-monthly
Soil erosion can result in visual scarring on prominent areas.	• In areas where construction has taken place on steeper slopes, soil erosion measures need to be implemented.	Project management and EPC (checked monthly)	Clear methodology for rehabilitation and restoration is provided by the rehabilitation specialist. As soon as construction has concluded on the area at hand, rehabilitation processes need to commence.	Soil erosion is limited and effectively managed such that visual scarring does not take place.	Commencement of construction. On-going
Cut and Fill areas can generate visual scarring in the landscape beyond the locality.	• Cut & Fill areas should be limited as much as possible, with specific detail placed on prevention of soil erosion.	Project management and EPC with inputs from rehabilitation specialist.	Clear methodology for rehabilitation and restoration is provided by the rehabilitation specialist. As soon as construction has	Cut/ fill scaring is limited and effectively managed and does not dominate the attention of the casual observer.	Commencement of construction. On-going

Impact/ Aspect	Mitigation/Management Actions	*Responsibility*	*Methodology*	Mitigation/Management Objectives and Outcomes	*Frequency*
	• Slopes should not exceed 1 in 6m gradients and need to be rehabilitated to natural vegetation directly post construction.		concluded on the area at hand, rehabilitation processes need to commence.		

Table 20. Operational Phase EMP Table

Impact/ Aspect	**Mitigation/Management Actions**	***Responsibility***	***Methodology***	**Mitigation/Management Objectives and Outcomes**	***Frequency***
Compaction of larger areas can result in soil sterilisation and landscape degradation.	• Post construction, the laydown areas and other construction areas no longer needed for operational management, should be ripped (0.5m depth) to restore compacted topsoil, and then rehabilitated to natural vegetation under the supervision of the rehabilitation specialist.	Project management and EPC with inputs from rehabilitation specialist.	As defined by the rehabilitation specialist.	Soil sterilization does not take place and large degraded areas do not occur, with overall landscape integrity maintained.	On completion of construction phase. On-going
Soil erosion can result in visual scarring on prominent areas.	• In areas where construction has taken place on steeper slopes, soil erosion measures need to be implemented.	Project management and EPC	Clear methodology for rehabilitation and restoration is provided by the rehabilitation specialist. As soon as construction has concluded on the area at hand, rehabilitation processes need to commence.	Soil erosion is limited and effectively managed such that visual scarring does not take place.	Bi-annual
Light spillage from security lighting of structures can significantly increase the visual impact of a project in a rural landscape in a dark-sky context.	• Light spillage measures designed during pre-construction phase should be implemented and monitored by the ECO during construction to	Project management and EPC.	A review of the security lights at night is undertaken by the EPC to check that undue light spillage is not taking	Lights contrast generated from the buildings as seen from the roads is low and does not attract the	At commencement of Operation Phase.

Impact/ Aspect	Mitigation/Management Actions	*Responsibility*	*Methodology*	Mitigation/Management Objectives and Outcomes	*Frequency*
	ensure that light spillage does not create a glowing effect.		place without loss of security.	attention of the casual observer.	
Windblown dust and dust from moving vehicles have the potential to become a significant nuisance factor to local farms around the site and along the access road.	• Should excessive dust be generated from the movement of vehicles on the roads such that the dust becomes visible to the immediate surrounds, dust-retardant measures should be implemented under authorization of the ECO.	Project management and EPC (as the need arises).	Set up a clear management plan with clear accountability structures with set thresholds for triggering of mitigations.	Dust generated on site as well as on the access road to the site, is well managed and does not become a nuisance factor for the workers or the surrounding farmsteads.	On-going.

Table 21. Decommissioning Phase EMP Table

Impact/ Aspect	Mitigation/Management Actions	*Responsibility*	*Methodology*	Mitigation/Management Objectives and Outcomes	*Frequency*
Compaction of larger areas can result in soil sterilisation and landscape degradation.	• Post construction, the laydown areas and other construction areas no longer needed for operational management, should be ripped (0.5m depth) to restore compacted topsoil, and then rehabilitated to natural vegetation under the	Project management and EPC with inputs from rehabilitation specialist.	As defined by the rehabilitation specialist.	Soil sterilization does not take place and large degraded areas do not occur, with overall landscape integrity maintained.	Within 1 year of closure.

Impact/ Aspect	Mitigation/Management Actions	*Responsibility*	*Methodology*	Mitigation/Management Objectives and Outcomes	*Frequency*
	supervision of the rehabilitation specialist.				
Old, unused structures have the potential to significantly degrade the landscape character.	• All structures not required for agricultural purposes post-closure should be removed and where possible, recycled or reused. • Building structures should be broken down (including building foundations) • The rubble should be managed according to the National Environmental Management: Waste Act (Act 59 of 2008) (NEMWA) and deposited at a registered landfill if it cannot be recycled or reused.	Project management and EPC	As defined by the rehabilitation specialist.	The post operation landscape reverts to rural agricultural without landscape degradation created by un-used/ old structures.	Within 1 year of closure.

Impact/ Aspect	**Mitigation/Management Actions**	***Responsibility***	***Methodology***	**Mitigation/Management Objectives and Outcomes**	***Frequency***
Windblown dust and dust from moving vehicles have the potential to become a significant nuisance factor to local farms around the site and along the access road.	• Set up a clear management plan with clear accountability structures with set thresholds for triggering of mitigations. • Set up a liaison committee to engage with local farmsteads located within 500m of an access road, with monthly communication with the farm owners on the effectiveness of the dust management procedures.	Project management and EPC (as the issue arises).	Should excessive dust be generated from the movement of vehicles on the roads such that the dust becomes visible to the immediate surrounds, dust-retardant measures should be implemented under authorization of the EPC.	Dust generated on site as well as on the access road to the site, is well managed and does not become a nuisance factor for the workers or the surrounding farmsteads.	On-going

10 OPPORTUNITIES AND CONSTRAINTS

10.1 PV Site

10.1.1 Opportunities

- The ZVI is contained to the local area with Foreground/ Mid Ground distancing due to undulating terrain that results in a moderate zone of visual influence.
- No tourist activities or tourist view-corridors were located within the project ZVI.
- National energy objectives for renewable energy and job creation will be met.
- Minimal receptors with Medium to Low Visual Exposure.
- The area is within the REDZ area.

10.1.2 Constraints

- Receptors are predominantly rural agricultural related and could be sensitive to landscape change.

10.2 PV Site No-Go Option

10.2.1 Opportunities

- The current rural agricultural land uses of the property do add to the rural agricultural landscape character. The network of small farm dams add value to local landscape resources.
- Agricultural productivity creates some employment opportunities.

10.2.2 Constraints

- National energy objectives for renewable energy and job creation will not be met.
- Limited potential for landscape-based tourism due to close proximity to the Wonderfontein Silo.

Findings

The preference is for the PV area as National energy objectives for renewable energy and job creation will not be met and there is limited potential for landscape-based tourism due to close proximity to the Wonderfontein Silo. Landscape resources will not be significantly altered and cultural landscape associated with the rural agrarian land uses will continue, as most of the PV areas are located in low prominence areas, or small in scale where a massing effect from views of large PV coverage will not take place.

10.3 Alternative LILO, Substation, BESS and Laydown

10.3.1 Opportunities

- The ZVI is contained to the local area with Foreground/ Mid Ground distancing due to undulating terrain that results in a moderate zone of visual influence.
- No tourist activities or tourist view-corridors were located within the project ZVI.
- National energy objectives for renewable energy and job creation will be met.

10.3.2 Constraints

- Some gradient that will require cut and fills that will require careful design and rehabilitation post construction.

- Receptors are rural agricultural and could be sensitive to landscape change.

10.4 Alternative LILO, Substation, BESS and Laydown No-Go Option

10.4.1 Opportunities

- The current rural agricultural land uses of the property do add to the rural agricultural landscape character.
- Agricultural productivity creates some employment opportunities.

10.4.2 Constraints

- National energy objectives for renewable energy and job creation will not be met.
- Limited potential for landscape-based tourism due to close proximity to the Wonderfontein Silo.

Findings

With and without mitigation, the preference is for the Alternative LILO, Substation, BESS and Laydown as National energy objectives for renewable energy and job creation will not be met and there is limited potential for landscape-based tourism due to close proximity to the Wonderfontein Silo. The landscape and visual impacts are low due to the smaller footprint, low prominence, limited receptors and close proximity to the existing Eskom Powerline.

10.5 Preferred LILO, Substation, BESS and Laydown

10.5.1 Opportunities

- The ZVI is contained to the local area with Foreground/ Mid Ground distancing due to undulating terrain that results in a moderate zone of visual influence.
- No tourist activities or tourist view-corridors were located within the project ZVI.
- National energy objectives for renewable energy and job creation will be met.
- Minimal receptors with Low Visual Exposure.

10.5.2 Constraints

- Some steep slopes that could result in large cut and fills and thus local landscape degradation.
- Some gradient that will require moderate cut and fills that will require careful design and rehabilitation post construction.
- Receptors are rural agricultural and could be sensitive to landscape change.

10.6 Preferred LILO, Substation, BESS and Laydown No-Go Option

10.6.1 Opportunities

- The current rural agricultural land uses of the property do add to the rural agricultural landscape character.
- Agricultural productivity creates some employment opportunities.

10.6.2 Constraints

- National energy objectives for renewable energy and job creation will not be met.
- Limited potential for landscape-based tourism due to close proximity to the Wonderfontein Silo.

Findings

With and without mitigation, the preference is for the Preferred LILO, Substation, BESS and Laydown as National energy objectives for renewable energy and job creation will not be met and there is limited potential for landscape-based tourism due to close proximity to the Wonderfontein Silo. The landscape and visual impacts are low due to the smaller footprint, low prominence, limited receptors and close proximity to the existing Eskom Powerline.

11 CONCLUSION

It is the recommendation that the proposed PV project should be authorised WITH Mitigation. With mitigation, the benefits of the PV related landscape change are likely to outweigh the landscape status quo, where scenic resources are limited. In terms of Landscape and Visual Impact Significance, the PV project is rated Medium without mitigation, and Medium to Low with mitigation or wind-blown dust, lights at night as well as soil erosion on the PV panels areas located on slope areas (less than 1 in 10m). In terms of negative cumulative effects, without mitigation the risk is rated High due to light spillage in the rural landscape from security lights at night. With mitigation and the careful management of security lighting and no overhead flood lights for the PV, BESS or substation areas, the risk can be reduced to Low. While both the Preferred and Alternative LILO/ BESS areas are suitable, there is a preference for the Preferred LILO area as the locality is less exposed to rural receptors. The following key reasons provide the motivation for the overall PV development:

5. The site visual resources are limited with a Medium rating for Scenic Quality and Low rating for Receptor Sensitivity to landscape change.
6. Regionally, the viewshed is contained to some degree from topographic screening and has no High or Medium Exposure Receptors. The nearest significant receptor area is the KNP located 12km to the north where massing effects of the combined views of the PV areas will not generate a dominating visual effect.
7. National energy objectives for renewable energy and job creation will be met and there is a good alignment with regional and local planning.
8. Medium rating for Visual Impact Significance with mitigation.

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13 ANNEXURE A: SITE VISIT PHOTOGRAPHS AND COMMENTS

The following photographs were taken during the field survey as mapped below. The text below the photograph describes the landscape and visual issues of the locality, if applicable.

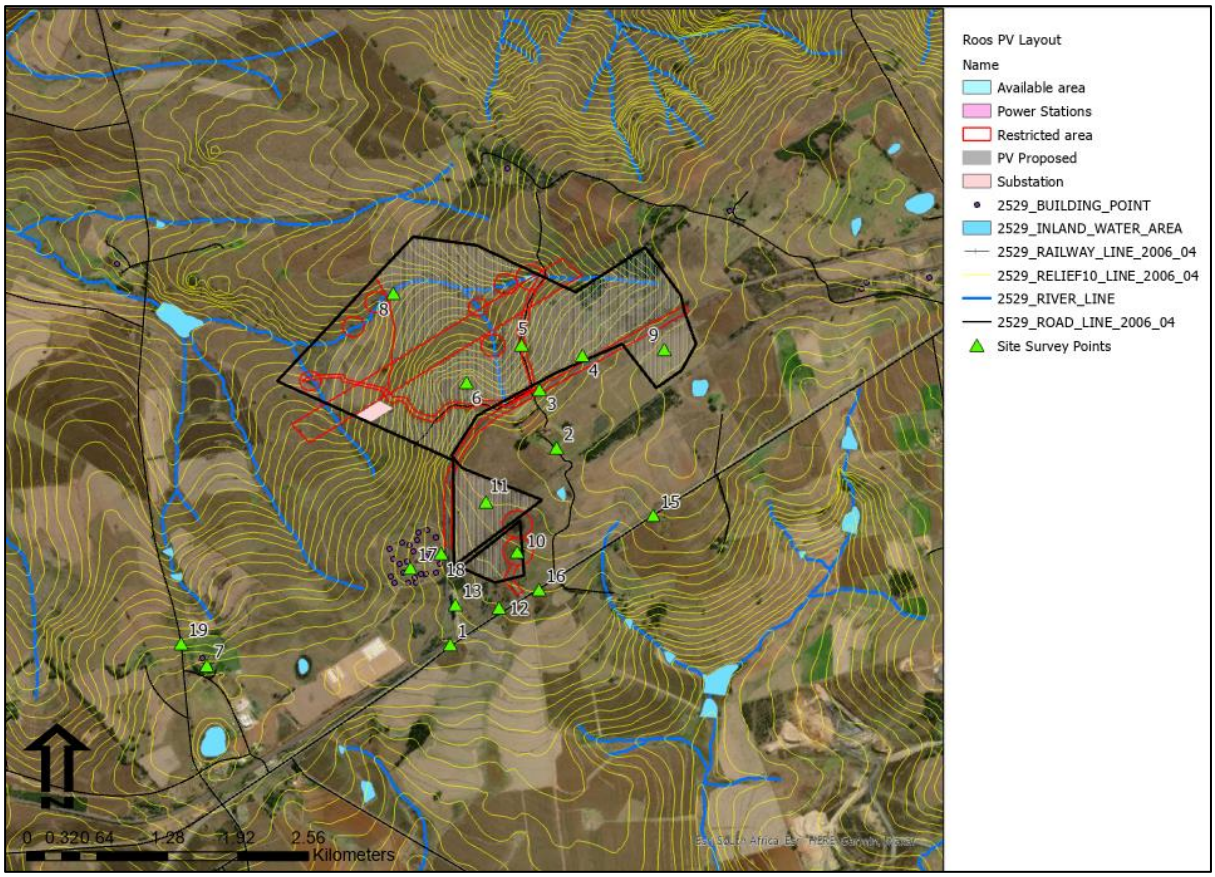

Figure 17: Site Survey Point Map

ID	1
PHOTO	N4 Highway eastbound
DIRECTION	NE
COMMENT	High visual absorption capacity from road, rail and silo infrastructure with no views of the proposed PV structures.

ID	2
PHOTO	Farm Sense of Place
DIRECTION	W
COMMENT	Rural agricultural dryland with higher visual absorption capacity levels. Trees and undulating terrain.

ID	3
PHOTO	Railway line infrastructure
DIRECTION	N
COMMENT	Low risk due to higher visual absorption capacity levels and undulating terrain.

ID	4
PHOTO	Veld grasslands and powerlines
DIRECTION	NE
COMMENT	Close proximity to railway line. No close proximity receptors.

ID	5
PHOTO	Drainage line and dams
DIRECTION	SW
COMMENT	Remote, undulating with no high exposure receptors. Some steep slope areas adding value to the Scenic Quality where the prominent ridgeline and surrounding steeper slopes would need to be excluded from the development.

ID	6
PHOTO	Undulating grasslands
DIRECTION	N
COMMENT	Prominent ridgeline within background view of rural residents with rural agrarian landscape adding value to the Scenic Quality.

ID	7
PHOTO	Rural residents as seen from property
DIRECTION	S
COMMENT	Rural landscape but with some industrial context from silo and factories as well as alien vegetation detracting from the local Scenic Quality.

ID	8
PHOTO	Farm Dams
DIRECTION	NW
COMMENT	Agricultural lands with small series of dams adding value to the local landscape. The existing powerline routing through the property is also visible.

ID	9
PHOTO	Undulating grasslands
DIRECTION	E
COMMENT	Flat terrain that is visually well contained offering very little visual exposure to the N4 receptors, or southwestern rural agrarian receptors.

ID	10
PHOTO	Informal structures
DIRECTION	N
COMMENT	Informal structures located on the southern portion of the proposed PV development area. SIA comments need to inform the VIA in terms of receptor status.

ID	11
PHOTO	Undulating grasslands
DIRECTION	SW
COMMENT	Lower visual absorption capacity or the southern area due to closer proximity to agri-village receptors with clear views of upper PV development areas.

ID	12
PHOTO	N4 receptor eastbound
DIRECTION	SE
COMMENT	Higher visual absorption capacity from silo in the background but with little clear visibility of the PV structures (partial views or upper structures) due to road cutting into the landscape and alien trees adjacent to the road.

ID	13
PHOTO	Silo sense of place
DIRECTION	S
COMMENT	Dominant feature of commercial maize farming. Mining landscape context clearly visible in the project zone of visual influence.

ID	14
PHOTO	Mining sense of place
DIRECTION	SE
COMMENT	Degraded mining landscape in the background also negatively informs the regional landscape character.

ID	15
PHOTO	N4 Westbound
DIRECTION	SW
COMMENT	The view from the N4 southbound with the local context defined by dryland maize farming with silo the key feature. Possible skyline intrusion (low intensity) of PV panels in the background from the southwestern PV areas. No views of the northern (north of railway line) or the eastern PV areas due to road topography and alien vegetation.

ID	16
PHOTO	N4 Highway Westbound 2
DIRECTION	W
COMMENT	View form the N4 Highway eastbound from the location in close proximity to silo with limited views of the proposed PV structures likely (preference for max. 4m height)

ID	17
PHOTO	Agri-village
DIRECTION	E
COMMENT	Residential receptors in close proximity to silo development context.

ID	18
PHOTO	Agri-village KOP
DIRECTION	N
COMMENT	Open views of undulating grasslands *away* from site views, with partial screening from alien trees along railway line reducing risk for higher levels of visual intrusion.

ID	19
PHOTO	Eastern rural agriculture KOP
DIRECTION	E
COMMENT	Open views of proposed PV structures located in the background on undulating grasslands in rural agricultural landscape. As seen from location there is some minor visual disturbance from powerlines, as well as clustered development around the silo the create a nodal/ development sense of place (i.e. not pure rural agricultural landscape context).

14 ANNEXURE B: SiVEST IMPACT ASSESSMENT CRITERIA

1 ENVIRONMENTAL IMPACT ASSESSMENT (EIA) METHODOLOGY

The Environmental Impact Assessment (EIA) Methodology assists in evaluating the overall effect of a proposed activity on the environment. Determining of the significance of an environmental impact on an environmental parameter is determined through a systematic analysis.

1.1 Determination of Significance of Impacts

Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale (i.e. site, local, national or global), whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is calculated as shown in Table 1.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

1.2 Impact Rating System

The impact assessment must take account of the nature, scale and duration of effects on the environment and whether such effects are positive (beneficial) or negative (detrimental). Each issue / impact is also assessed according to the various project stages, as follows:

- Planning;
- Construction;
- Operation; and
- Decommissioning.

Where necessary, the proposal for mitigation or optimisation of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance has also been included.

The significance of Cumulative Impacts should also be rated (As per the Excel Spreadsheet Template).

1.2.1 Rating System Used to Classify Impacts

The rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the possible mitigation of the impact. Impacts have been consolidated into one (1) rating. In assessing the significance of each issue the following criteria (including an allocated point system) is used:

Table 1: Rating of impacts criteria

ENVIRONMENTAL PARAMETER		
A brief description of the environmental aspect likely to be affected by the proposed activity (e.g. Surface Water).		
ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity (e.g. oil spill in surface water).		
EXTENT (E)		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect the site
2	Local/district	Will affect the local area or district
3	Province/region	Will affect the entire province or region
4	International and National	Will affect the entire country
PROBABILITY (P)		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
REVERSIBILITY (R)		
This describes the degree to which an impact on an environmental parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES (L)		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
DURATION (D)		
This describes the duration of the impacts on the environmental parameter. Duration indicates the lifetime of the impact as a result of the proposed activity.		

1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
INTENSITY / MAGNITUDE (I / M)		
Describes the severity of an impact (i.e. whether the impact has the ability to alter the functionality or quality of a system permanently or temporarily).		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
SIGNIFICANCE (S)		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the environmental parameter. The calculation of the significance of an impact uses the following formula: **Significance = (Extent + probability + reversibility + irreplaceability + duration) x magnitude/intensity.**		

The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.

Points	Impact Significance Rating	Description
5 to 23	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
5 to 23	Positive Low impact	The anticipated impact will have minor positive effects.
24 to 42	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
24 to 42	Positive Medium impact	The anticipated impact will have moderate positive effects.
43 to 61	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
43 to 61	Positive High impact	The anticipated impact will have significant positive effects.
62 to 80	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
62 to 80	Positive Very high impact	The anticipated impact will have highly significant positive effects.

The table below is to be represented in the Impact Assessment section of the report. The excel spreadsheet template can be used to complete the Impact Assessment.

Operational Phase																				
Fauna	Fauna will be negatively affected by the operation of the wind farm due to the human disturbance, the presence of vehicles on the site and possibly by noise generated by the wind turbines as well.	2	3	2	1	4	3	36	-	Medium	**Outline/explain the mitigation measures to be undertaken to ameliorate the impacts that are likely to arise from the proposed activity. These measures will be detailed in the EMPr.**	2	2	2	1	4	2	22	-	Low
Decommissioning Phase																				
Fauna	Fauna will be negatively affected by the decommissioning of the wind farm due to the human disturbance, the presence and operation of vehicles and heavy machinery on the site and the noise generated.	2	3	2	1	2	3	30	-	Medium	**Outline/explain the mitigation measures to be undertaken to ameliorate the impacts that are likely to arise from the proposed activity. These measures will be detailed in the EMPr.**	2	2	2	1	2	2	18	-	Low

Table 2: Rating of impacts template and example

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 (+ OR -)	S		E	P	R	L	D	I – M	TOTAL	STATUS (+ OR -)	S
Construction Phase																				
Vegetation and protected plant species	Vegetation clearing for access roads, turbines and their service areas and other infrastructure will impact on vegetation and protected plant species.	2	4	2	2	3	3	39	-	Medium	**Outline/explain the mitigation measures to be undertaken to ameliorate the impacts that are likely to arise from the proposed activity. These measures will be detailed in the EMPr.**	2	4	2	1	3	2	24	-	Low

Cumulative																				
Broad-scale ecological processes	Transformation and presence of the facility will contribute to cumulative habitat loss and impacts on broad-scale ecological processes such as fragmentation.	2	4	2	2	3	2	26	-	Medium	**Outline/explain the mitigation measures to be undertaken to ameliorate the impacts that are likely to arise from the proposed activity. These measures will be detailed in the EMPr.**	2	3	2	1	3	2	22	-	Low

15 ANNEXURE C: SPECIALIST INFORMATION

15.1 Professional Registration Certificate

APHP

Association of Professional Heritage Practitioners

MEMBERSHIP CERTIFICATE

THIS CERTIFIES THAT

Stephen Stead

MEMBERSHIP NUMBER: PHP0063

has been awarded membership as a

PROFESSIONAL MEMBER (PHP)

This membership is subject to the *Standards for Membership* and *Code of Conduct*, referred to in Sections 2 and 3 of the APHP Constitution respectively. The definition of a Professional may be found at: www.aphp.org.za/membership

Please contact us via info@aphp.org.za should further information be required.

THIS CERTIFICATE IS VALID FROM 1 JUNE 2023 – 1 JULY 2024

VICE-CHAIRPERSON

[Issued by the Association of Professional Heritage Practitioners Executive Committee]

Watermark Image: Plate XXIII drawn by Mr J F Schofield, A.R.I.B.A.
Watermark Reference: Fouche, L. (1937) *Mapungubwe Ancient Bantu Civilization on the Limpopo* Cambridge University Press: London

Association of Professional Heritage Practitioners
info@aphp.org.za
www.aphp.org.za

15.2 Curriculum Vitae (CV)

1. **Position**: Owner / Director
2. **Name of Firm**: Visual Resource Management Africa cc *(www.vrma.co.za)*
3. **Name of Staff**: Stephen Stead
4. **Date of Birth**: 9 June 1967
5. **Nationality:** South African
6. **Contact Details:** **Tel: +27 (0) 44 876 0020**
   Cell: +27 (0) 83 560 9911
   Email: steve@vrma.co.za
7. **Educational qualifications**:
   - University of Natal (Pietermaritzburg):
   - Bachelor of Arts: Psychology and Geography
   - Bachelor of Arts (Hons): Human Geography and Geographic Information Management Systems
8. **Professional Accreditation**
   - Association of Professional Heritage Practitioners (APHP) Western Cape
     - Accredited VIA practitioner member of the Association (2011)
9. **Association involvement:**
   - International Association of Impact Assessment (IAIA) South African Affiliate
     - Past President (2012 - 2013)
     - President (2012)
     - President-Elect (2011)
     - Conference Co-ordinator (2010)
     - National Executive Committee member (2009)
     - Southern Cape Chairperson (2008)
10. **Conferences Attended:**
    - IAIAsa 2012
    - IAIAsa 2011
    - IAIA International 2011 (Mexico)
    - IAIAsa 2010
    - IAIAsa 2009
    - IAIAsa 2007
11. **Continued Professional Development:**
    - Integrating Sustainability with Environment Assessment in South Africa (IAIAsa Conference, 1 day)
    - Achieving the full potential of SIA (Mexico, IAIA Conference, 2 days 2011)
    - Researching and Assessing Heritage Resources Course (University of Cape Town, 5 days, 2009)

12. Countries of Work Experience:

- South Africa, Mozambique, Malawi, Lesotho, Kenya and Namibia

13. Relevant Experience:

Stephen gained six years of experience in the field of Geographic Information Systems mapping and spatial analysis working as a consultant for the KwaZulu-Natal Department of Health and then with an Environmental Impact Assessment company based in the Western Cape. In 2004 he set up the company Visual Resource Management Africa that specializes in visual resource management and visual impact assessments in Africa. The company makes use of the well-documented Visual Resource Management methodology developed by the Bureau of Land Management (USA) for assessing the suitability of landscape modifications. Stephen has assessed of over 150 major landscape modifications throughout southern and eastern Africa. The business has been operating for eighteen years and has successfully established and retained a large client base throughout Southern Africa which include amongst other, Rio Tinto (Pty) Ltd, Bannerman (Pty) Ltd, Anglo Coal (Pty) Ltd, Eskom (Pty) Ltd, NamSolar and Vale (Pty) Ltd, Ariva (Pty) Ltd, Harmony Gold (Pty) Ltd, Millennium Challenge Account (USA), Pretoria Portland Cement (Pty) Ltd

14. Languages:

- English – First Language
- Afrikaans – fair in speaking, reading and writing

15. Projects:

A list of ***some*** of the large-scale projects that VRMA has assessed has been attached below with the client list indicated per project (Refer to www.vrma.co.za for a full list of projects undertaken).

Table 22: VRM Africa Projects Assessments Summary Table as July 2023.

DESCRIPTION	COUNT
Battery Storage	15
Dam	1
GIS Mapping	7
Golf/Residential	5
Hydroelectric	4
Industrial	12
Mari-culture	1
Mine	20
OHPL	11
Port	1
Power Station	3
Railway	1
Residential	45
Resort	4
Road Infrastructure	5

Solar Energy	61
Structure	9
Substation	5
UISP	8
Wind Energy	14
Total	**232**

16 ANNEXURE D: METHODOLOGY DETAIL

16.1 Baseline Analysis Stage

In terms of VRM methodology, landscape character is derived from a combination of ***scenic quality***, ***receptor sensitivity*** to landscape change and ***distance*** from the proposed landscape change. The objective of the analysis is to compile a mapped inventory of the visual resources found in the receiving landscape, and to derive a mapped Visual Resource sensitivity layer from which to evaluate the suitability of the landscape change.

16.1.1 Scenic Quality

The scenic quality is determined making use of the VRM Scenic Quality Checklist that identifies seven scenic quality criteria which are rated with 1 (low) to 5 (high) scale. The scores are totalled and assigned an A (High), B (Moderate) or C (low) based on the following split:
A= scenic quality rating of ≥19;
B = rating of 12 – 18,
C= rating of ≤11

The seven scenic quality criteria are defined below:

- **Land Form**: Topography becomes more of a factor as it becomes steeper, or more severely sculptured.
- **Vegetation**: Primary consideration given to the variety of patterns, forms, and textures created by plant life.
- **Water**: That ingredient which adds movement or serenity to a scene. The degree to which water dominates the scene is the primary consideration.
- **Colour**: The overall colour(s) of the basic components of the landscape (e.g., soil, rock, vegetation, etc.) are considered as they appear during seasons or periods of high use.
- **Scarcity**: This factor provides an opportunity to give added importance to one, or all, of the scenic features that appear to be relatively unique or rare within one physiographic region.
- **Adjacent Land Use**: Degree to which scenery and distance enhance, or start to influence, the overall impression of the scenery within the rating unit.
- **Cultural Modifications**: Cultural modifications should be considered and may detract from the scenery or complement or improve the scenic quality of an area.

16.1.2 Receptor Sensitivity

Receptor sensitivity to landscape change is determined by rating the following factors in terms of Low to High:

- **Type of Users**: Visual sensitivity will vary with the type of users, e.g. recreational sightseers may be highly sensitive to any changes in visual quality, whereas workers who pass through the area on a regular basis may not be as sensitive to change.
- **Amount of Use**: Areas seen or used by large numbers of people are potentially more sensitive.
- **Public Interest**: The visual quality of an area may be of concern to local, or regional, groups. Indicators of this concern are usually expressed via public controversy created in response to proposed activities.
- **Adjacent Land Uses**: The interrelationship with land uses in adjacent lands. For example, an area within the viewshed of a residential area may be very sensitive, whereas an area surrounded by commercially developed lands may not be as visually sensitive.
- **Special Areas**: Management objectives for special areas such as Natural Areas, Wilderness Areas or Wilderness Study Areas, Wild and Scenic Rivers, Scenic Areas, Scenic Roads or Trails, and Critical Biodiversity Areas frequently require special consideration for the protection of their visual values.
- **Other Factors**: Consider any other information such as research or studies that include indicators of visual sensitivity.

16.1.3 Exposure

The area where a landscape modification starts to influence the landscape character is termed the Zone of Visual Influence (ZVI) and is defined by the U.K. Institute of Environmental Management and Assessment's (IEMA) *'Guidelines for Landscape and Visual Impact Assessment'* as 'the area within which a proposed development may have an influence or effect on visual amenity (of the surrounding areas).'

The inverse relationship of distance and visual impact is well recognised in visual analysis literature *(Hull, R.B. and Bishop, I.E., 1988)*. According to Hull and Bishop, exposure, or visual impact, tends to diminish exponentially with distance. The areas where most landscape modifications would be visible are located within 2 km from the site of the landscape modification. Thus, the potential visual impact of an object diminishes at an exponential rate as the distance between the observer and the object increases due to atmospheric conditions prevalent at a location, which causes the air to appear greyer, thereby diminishing detail. For example, viewed from 1000 m from a landscape modification, the impact would be 25% of the impact as viewed from 500 m from a landscape modification. At 2000m it would be 10% of the impact at 500 m.

Distance from a landscape modification influences the size and clarity of the landscape modification viewing. The Bureau of Land Management defines three distance categories:

i. ***Foreground / Middle ground***, up to approximately 6km, which is where there is potential for the sense of place to change;
ii. ***Background areas***, from 6km to 24km, where there is some potential for change in the sense of place, but where change would only occur in the case of very large landscape modifications; and
iii. ***Seldom seen areas***, which fall within the Foreground / Middle ground area but, as a result of no receptors, are not viewed or are seldom viewed.

16.1.4 Key Observation Points

During the Baseline Inventory Stage, Key Observation Points (KOPs) are identified. KOPs are defined by the Bureau of Land Management as the people (receptors) located in strategic locations surrounding the property that make consistent use of the views associated with the site where the landscape modifications are proposed. These locations are important in terms of the VRM methodology, which requires that the Degree of Contrast (DoC) that the proposed landscape modifications will make to the existing landscape be measured from these most critical locations, or receptors, surrounding the property. To define the KOPs, potential receptor locations were identified in the viewshed analysis, and screened, based on the following criteria:

- Angle of observation.
- Number of viewers.
- Length of time the project is in view.
- Relative project size.
- Season of use.
- Critical viewpoints, e.g., views from communities, road crossings; and
- Distance from property.

16.2 Assessment and Impact Stage

The analysis stage involves determining whether the potential visual impacts from proposed surface-disturbing activities or developments will meet the management objectives established for the area, or whether design adjustments will be required. This requires a contrast rating to assess the expected DoC the proposed landscape modifications would generate within the receiving landscape in order to define the Magnitude of the impact.

16.2.1 Contrast Rating

The contrast rating is undertaken to determine if the VRM Class Objectives are met. The suitability of landscape modification is assessed by comparing and contrasting existing receiving landscape to the expected contrast that the proposed landscape change will generate. This is done by evaluating the level of change to the existing landscape by assessing the line, colour, texture and form, in relation to the visual objectives defined for the area. The following criteria are utilised in defining the DoC:

- **None**: The element contrast is not visible or perceived.
- **Weak**: The element contrast can be seen but does not attract attention.
- **Moderate**: The element contrast begins to attract attention and begins to dominate the characteristic landscape.
- **Strong**: The element contrast demands attention, will not be overlooked, and is dominant in the landscape.

As an example, in a Class I area, the visual objective is to preserve the existing character of the landscape, and the resultant contrast to the existing landscape should not be notable to the casual observer and cannot attract attention. In a Class IV area example, the objective is to provide for proposed landscape activities that allow for major modifications of the existing character of the landscape. Based on whether the VRM objectives are met, mitigations, if required, are defined to avoid, reduce or mitigate the proposed landscape modifications so that the visual impact does not detract from the surrounding landscape sense of place.

Based on the findings of the contrast rating, the Magnitude of the Landscape and Visual Impact Assessment is determined.

16.2.2 Photomontages

As a component in this contrast rating process, visual representation, such as photo montages are vital in large-scale modifications, as this serves to inform Interested & Affected Parties and decision-making authorities of the nature and extent of the impact associated with the proposed project/development. There is an ethical obligation in this process, as visualisation can be misleading if not undertaken ethically. In terms of adhering to standards for ethical representation of landscape modifications, VRMA subscribes to the Proposed Interim Code of Ethics for Landscape Visualisation developed by the Collaborative for Advanced Landscape Planning (CALP) (Sheppard, 2000). This code states that professional presenters of realistic landscape visualisations are responsible for promoting full understanding of proposed landscape changes, providing an honest and neutral visual representation of the expected landscape, by seeking to avoid bias in responses and demonstrating the legitimacy of the visualisation process. Presenters of landscape visualisations should adhere to the principles of:

- Access to Information
- Accuracy
- Legitimacy
- Representativeness
- Visual Clarity and Interest

The Code of Ethical Conduct states that the presenter should:

- Demonstrate an appropriate level of qualification and experience.
- Use visualisation tools and media that are appropriate to the purpose.
- Choose the appropriate level of realism.
- Identify, collect and document supporting visual data available for, or used in, the visualisation process.
- Conduct an on-site visual analysis to determine important issues and views.
- Seek community input on viewpoints and landscape issues to address in the visualisations.
- Provide the viewer with a reasonable choice of viewpoints, view directions, view angles, viewing conditions and timeframes appropriate to the area being visualised.
- Estimate and disclose the expected degree of uncertainty, indicating areas and possible visual consequences of the uncertainties.
- Use more than one appropriate presentation mode and means of access for the affected public.
- Present important non-visual information at the same time as the visual presentation, using a neutral delivery.
- Avoid the use, or the appearance of, ‘sales’ techniques or special effects.
- Avoid seeking a particular response from the audience.
- Provide information describing how the visualisation process was conducted and how key decisions were taken (Sheppard, 2000).

17 ANNEXURE E: DFFE DECLARATION OF INDEPENDENCE