

THE PROPOSED VANDERKLOOF SOLAR PV AND BESS FACILITY, FREE STATE PROVINCE, SOUTH AFRICA

Visual Impact Assessment: Site Sensitivity Verification Report

Draft v_1

DATE: 29 April 2024

Document prepared for Cape EAPrac
On behalf of Vanderkloof Solar (Pty) Ltd



Visual Resource Management Africa cc
P O Box 7233, George, 6531
Cell: +27 (83) 560 9911
E-Mail: steve@vrma.co.za
Web: www.vrma.co.za



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LIST OF ACRONYMS

<i>APHP</i>	Association of Professional Heritage Practitioners
<i>BLM</i>	Bureau of Land Management (United States)
<i>BPEO</i>	Best Practicable Environmental Option
<i>CALP</i>	Collaborative for Advanced Landscape Planning
<i>DEM</i>	Digital Elevation Model
<i>DoC</i>	Degree of Contrast
<i>EIA</i>	Environmental Impact Assessment
<i>EMPr</i>	Environmental Management Plan
<i>GIS</i>	Geographic Information System
<i>GPS</i>	Global Positioning System
<i>IDP</i>	Integrated Development Plan
<i>IEMA</i>	Institute of Environmental Management and Assessment (United Kingdom)
<i>KOP</i>	Key Observation Point
<i>LVIA</i>	Landscape and Visual Impact Assessment
<i>MAMSL</i>	Metres above mean sea level
<i>NELPAG</i>	New England Light Pollution Advisory Group
<i>PNR</i>	Private Nature Reserve
<i>SDF</i>	Spatial Development Framework
<i>SEA</i>	Strategic Environmental Assessment
<i>VAC</i>	Visual Absorption Capacity
<i>VIA</i>	Visual Impact Assessment
<i>VRM</i>	Visual Resource Management
<i>VRMA</i>	Visual Resource Management Africa
<i>ZVI</i>	Zone of Visual Influence

GLOSSARY OF TECHNICAL TERMS

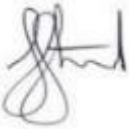
Technical Terms	Definition (Oberholzer, 2005)
Degree of Contrast	The measure in terms of the form, line, colour and texture of the existing landscape in relation to the proposed landscape modification in relation to the defined visual resource management objectives.
Visual intrusion	Issues are concerns 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

1.1 Specialist declaration of independence

The DFFE specialist declaration of independence has been signed and provided to Cape EAPrac.

Table 1. Specialist declaration of independence.

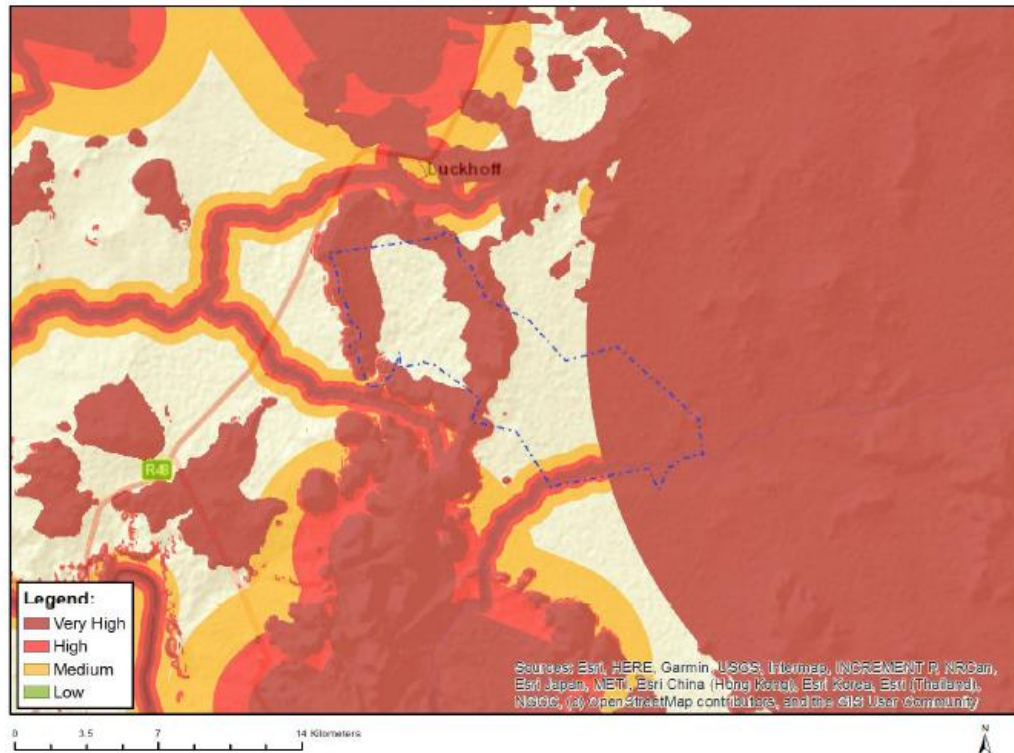
<p>All intellectual property rights and copyright associated with VRM Africa's services are reserved, and project deliverables, including electronic copies of reports, maps, data, shape files and photographs, may not be modified or incorporated into subsequent reports in any form, or by any means, without 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.</p> <p>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.</p>  <p>Stephen Stead <i>APHP accredited VIA Specialist</i></p>

1.2 Site Sensitivity Verification

In order to assess the site sensitivity pertaining to landscape and visual resources, a **site visit that was undertaken on 11 February 2024**. 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 maps and tables outline the risks as informed by DFFE Screening Tool as well as the site visit.

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).

MAP OF RELATIVE LANDSCAPE (SOLAR) THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
High	Slope between 1:4 and 1:10
High	Within 500 m of a river
Low	Slope less than 1:10
Medium	Between a and 2 km of a town or village
Medium	Within 1000 m of a wetland
Very High	South African Large Telescope
Very High	Mountain tops and high ridges
Very High	Slope more than 1:4
Very High	Within 250 m of a river

Figure 1. DFFE Screening Tool for Landscape.

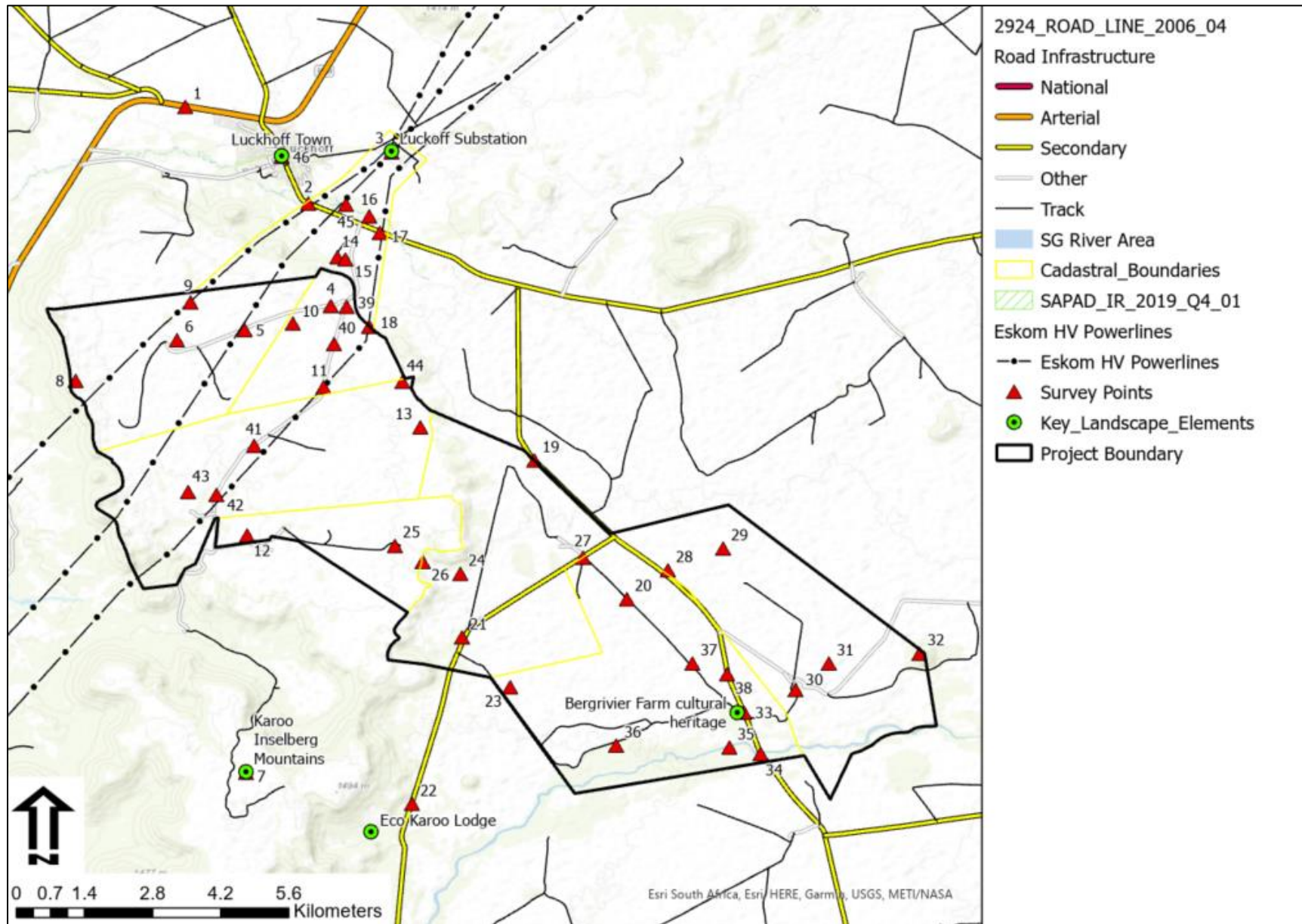


Figure 2: Site survey point and preliminary development sensitivity map.

Table 2. Site Survey Issue and Risk Table.

_ID	_REMARKS	_REC_TIME	LATITUDE	LONGITUDE	Risk	Motivation
1	R48 road view	04/09/2024 08:13:50.999 GMT+02:00	-29.7387	24.7689	Low	No views of the proposed PV due to the wide plateau topography where the surrounding high ground effectively screens the plateau areas.
2	Eskom powerline corridor	04/09/2024 08:19:13.999 GMT+02:00	-29.7566	24.79162	Low	Existing , strong presence of OHPL corridors in the local landscape context.
3	Eskom Luckoff substation	04/09/2024 08:20:41.614 GMT+02:00	-29.7471	24.80698	Low	Degraded local landscape
4	Shallow basin plateau grasslands	04/09/2024 08:42:25.000 GMT+02:00	-29.7755	24.79575	Medium	Unique in some sense in that the elevated area is enclosed topographically, but locally regarded by multiple Eskom TX. Topographically contained so no receptors other than land owners.
5	Eskom powerline corridor	04/09/2024 08:52:30.000 GMT+02:00	-29.7799	24.77984	Medium	Local landscape degradation.
6	Drainage line	04/09/2024 08:57:50.000 GMT+02:00	-29.7818	24.76737	High	Exclusion as per specialists' recommendation.
7	Karoo inselberg type mountain features	04/09/2024 08:59:44.252 GMT+02:00	-29.8617	24.78012	Medium	Well set back from development area and no receptors.
8	Western high ground ridgeline	04/09/2024 09:02:57.906 GMT+02:00	-29.7893	24.74864	High	Steep slopes for exclusion and also provides topographic screening.
9	Eskom powerline corridor	04/09/2024 09:04:48.221 GMT+02:00	-29.7748	24.76985	Medium	Local landscape degradation.

_ID	_REMARKS	_REC_TIME	LATITUDE	LONGITUDE	Risk	Motivation
10	Farmstead	04/09/2024 09:17:33.613 GMT+02:00	-29.7787	24.78876	Medium	Buffer 200m for medium. Limited cultural landscape value.
11	Eskom powerline corridor	04/09/2024 09:27:51.999 GMT+02:00	-29.7905	24.79443	Low	Local landscape degradation.
12	Mountainous terrain.	04/09/2024 09:36:11.366 GMT+02:00	-29.8179	24.78031	High	Mountainous terrain and foothills of high scenic quality.
13	Western high ground ridgeline	04/09/2024 09:38:26.833 GMT+02:00	-29.7979	24.8123	High	Prominent ridgeline. Buffer eastern high ground to reduce skyline intrusion.
14	Subsistence farmer	04/09/2024 09:51:36.078 GMT+02:00	-29.7665	24.79698	High	Buffer 200m for OHPL for medium following existing OHPL context.
15	Subsistence farmer	04/09/2024 09:53:25.449 GMT+02:00	-29.7669	24.79844	High	As previous
16	Drainage line	04/09/2024 09:56:10.798 GMT+02:00	-29.7589	24.80286	High	Exclusion
17	Eskom powerline corridor	04/09/2024 09:57:57.999 GMT+02:00	-29.762	24.80482	Low	As previous
18	Prominent ridgeline	04/09/2024 10:00:03.951 GMT+02:00	-29.7793	24.80285	High	Possible skyline intrusion for exclusion.

_ID	_REMARKS	_REC_TIME	LATITUDE	LONGITUDE	Risk	Motivation
19	S132 gravel road receptor	04/09/2024 10:08:57.999 GMT+02:00	-29.804	24.83336	High	Deep rural but possible tourist receptor to nature reserves north of the Vanderkloof Dam with extremely high visual exposure, buffer for medium intrusion.
20	Flat Nama-karoo grassland	04/09/2024 10:15:44.210 GMT+02:00	-29.8297	24.85045	Medium	
21	Mountainous terrain foothills of high scenic quality	04/09/2024 10:21:24.000 GMT+02:00	-29.8339	24.8235	High	Mountainous terrain and foothills of high scenic quality.
22	KOP Eco- karoo access road northbound	04/09/2024 10:31:01.999 GMT+02:00	-29.8675	24.81076	Medium	Well set back but guests would pass through the PV areas. Buffer road 100m for medium impact or restrict 'walling' in.
23	Skyline intrusion as seen from lower lying road	04/09/2024 10:36:23.155 GMT+02:00	-29.8459	24.82888	High	Possible skyline intrusion as seen from eco karoo access road. Buffer prominent areas for medium impact.
24	Mountainous terrain foothills of high scenic quality	04/09/2024 10:46:32.000 GMT+02:00	-29.825	24.81969	High	Exclusion
25	Mountainous terrain foothills of high scenic quality	04/09/2024 10:59:31.999 GMT+02:00	-29.8198	24.80761	High	Exclusion
26	Dry stone wall heritage	04/09/2024 11:11:20.999 GMT+02:00	-29.8227	24.81273	High	Exclusion as specialist recommended
27	33kv powerline	04/09/2024 11:23:32.999 GMT+02:00	-29.822	24.84233	Low	Rural agricultural sense of place and not degrading

_ID	_REMARKS	_REC_TIME	LATITUDE	LONGITUDE	Risk	Motivation
28	Low Ridgeline	04/09/2024 11:26:48.931 GMT+02:00	-29.8243	24.85801	High	For exclusion
29	Shallow gradient grasslands	04/09/2024 11:29:03.388 GMT+02:00	-29.8203	24.8682	Medium	Remote but higher scenic quality rating. Not used as a landscape resource and other than the road, not used as a visual resource.
30	Farmstead	04/09/2024 11:40:19.000 GMT+02:00	-29.846	24.88306	High	Buffer for maintenance of agrarian cultural landscape.
31	Low lying drainage	04/09/2024 11:42:46.290 GMT+02:00	-29.8415	24.88773	High	Exclusion
32	Spitzkop hill feature	04/09/2024 11:44:48.353 GMT+02:00	-29.8397	24.90446	High	Free standing Spitzkop type mountain feature adding value to local landscape. Buffer for exclusion.
33	Bergrivier Farm cultural heritage	04/09/2024 11:54:13.999 GMT+02:00	-29.8506	24.87208	High	Buffer for maintenance of agrarian cultural landscape.
34	Berg River	04/09/2024 11:56:47.999 GMT+02:00	-29.8582	24.87511	High	Exclusion
35	Berg River low lying flood plains	04/09/2024 11:58:29.678 GMT+02:00	-29.8571	24.86937	High	Exclusion
36	Shallow gradient grasslands	04/09/2024 12:11:18.634 GMT+02:00	-29.8567	24.84844	Medium	Some scenic value from adjacent mountains but not significant

_ID	_REMARKS	_REC_TIME	LATITUDE	LONGITUDE	Risk	Motivation
37	Centre pivots irrigation	04/09/2024 12:17:48.000 GMT+02:00	-29.8416	24.86254	High	Agrarian landscape exclusion to maintain agrarian cultural landscape.
38	KOP Farm road northbound	04/09/2024 12:26:58.999 GMT+02:00	-29.8435	24.86894	Medium	Mainly farm access but could be used for accessing the southern conservation area around Vanderkloof Dam. Buffer from medium impacts.
39	Prominent ridgeline	04/09/2024 12:47:46.000 GMT+02:00	-29.7756	24.79868	High	Exclusion
40	Rocky outcrops	04/09/2024 12:50:20.000 GMT+02:00	-29.7825	24.79636	High	Exclusion
41	Shallow gradient karoo scrub	04/09/2024 13:01:51.999 GMT+02:00	-29.8013	24.7816	Medium	Some scenic value from enclosed plateau topography but interior is fairly uniform and degraded by the three Eskom powerlines routed through the plateau.
42	Mountain context setback	04/09/2024 13:05:54.999 GMT+02:00	-29.8104	24.77465	High	Exclusion
43	Rocky outcrop	04/09/2024 13:06:57.730 GMT+02:00	-29.8099	24.76941	High	Exclusion
44	Ridgeline prominence	04/09/2024 13:24:05.999 GMT+02:00	-29.7895	24.809	High	Exclusion
45	Dam in drainage line	04/09/2024 14:37:37.559 GMT+02:00	-29.7568	24.79856	High	Exclusion

_ID	_REMARKS	_REC_TIME	LATITUDE	LONGITUDE	Risk	Motivation
46	Luckhoff town	04/09/2024 14:42:02.000 GMT+02:00	-29.7479	24.78669	Low Positive	Degraded and no visual impact. The large scale of the SEF project would significantly add economic benefit to the to town.

Table 3. Landscape Type Constraints Table

OBJECTID	Name	Shape_Length	Shape_Area	VRM	DevSens
213	Agricultural	0.169911	0.001017	Class III	Suitable with mitigation
253	Agricultural Fragment	0.081408	6.44E-05	Class II	Not suitable
86	Boundary Massing Buffer 250m	0.055425	5.41E-05	Class II	Not suitable
222	Drainage_Approx	0.306785	0.000762	Class II	Not suitable
176	EskomHV_Buffer 50m	0.008002	2.67E-06	Class IV	Not suitable
1	Farmstead Buffer 200m	0.011337	1.02E-05	Class II	Not suitable
33	Irrigation	0.009687	7.42E-06	Class II	Not suitable
9	Labour Dwellings Buffer 100m	0.005668	2.56E-06	Class I	Not suitable
200	Mountain_Scenic	0.014324	1.18E-05	Class I	Not suitable
292	Road Scenic Buffer 100m	0.096922	2.37E-05	Class II	Not recommended
287	Road Scenic Buffer 50m	0.006762	1.99E-06	Class I	Not suitable
195	Skyline_Buffer 50m	0.023233	9.85E-06	Class I	Not suitable

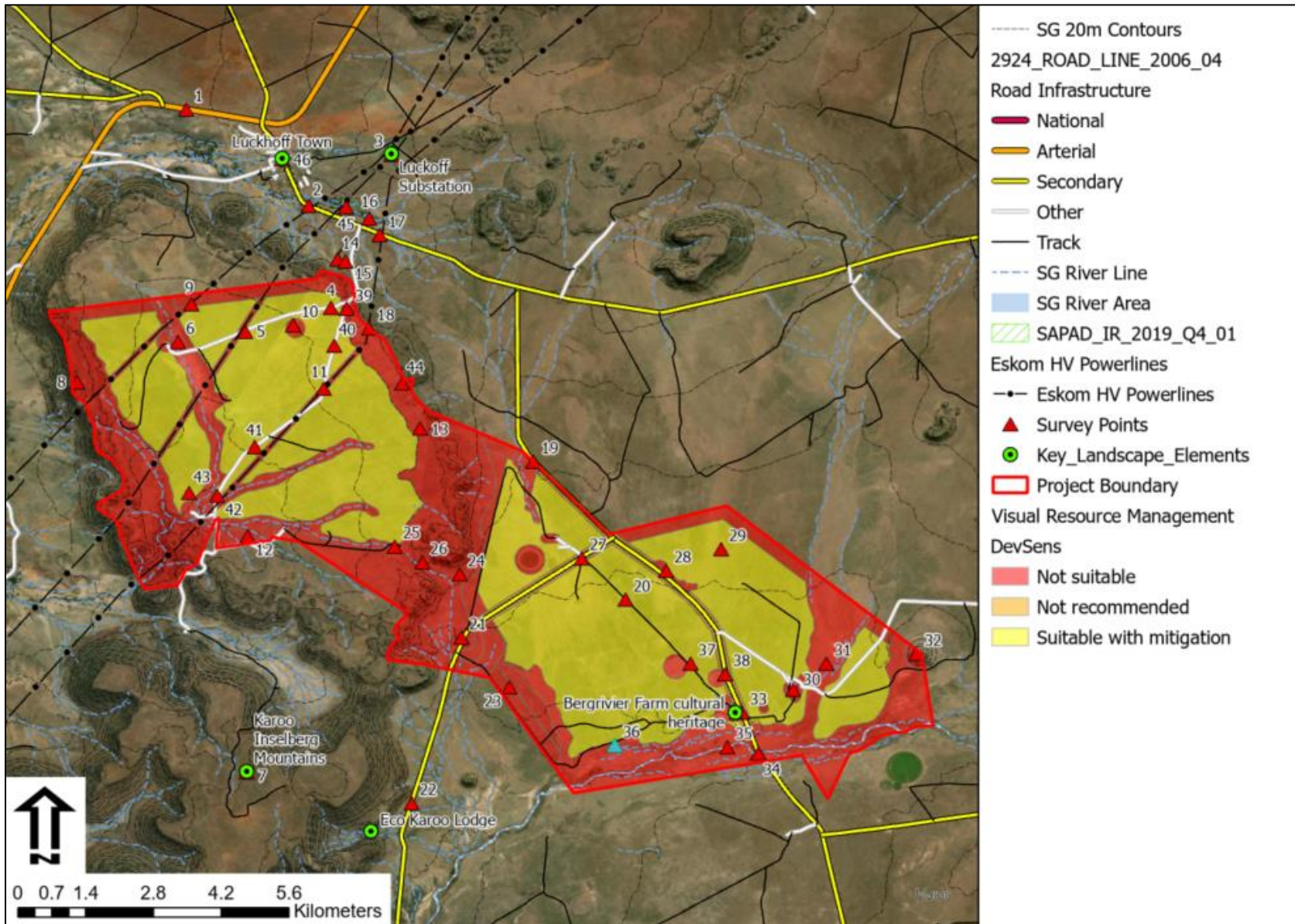


Figure 3: Preliminary Landscape and Visual Development Constraints Map.

Based on the site visit and a review of the landscape related planning for the region, the following table outlines the relevance of the risks raised in the SSV with motivation.

Table 4. Landscape Risk Table.

DFFE Feature	DFFE Sensitivity	Risk Verification	Motivation
Slope between 1:4 and 1: 10	High	High	There are numerous slopes between 1:10 and 1:4 that for the most part would not be suitable for development where they are in close proximity to the mountainous terrain and associated landforms.
Within 500m of a river	High	High	The study area is located within 500m of the Berg River.
Slope less than 1:10	Low	Low	There are slopes less than 1:10 that would be suitable for development.
Between 1 and 2 km of a town or village	Medium	Low	The town of Luckhoff is located 2.4km to the north of the study area but is unlikely to have views of the proposed PV development.
Within 1000m of a wetland	Medium	High	It is highly likely that the study area will be within 1000m of a wetland. These areas would need to be excluded by the Aquatic Biodiversity Specialist.
Mountain tops and high ridges	Very High	Very High	The wide plateau areas located within the northwestern portions of the study area, and the Spitzkop Mountain in the southeast, depict prominent mountain tops and high ridges and steep slopes greater than 1:4m. These areas would need to be excluded from the development area.
Slope of more than 1:4	Very High	Very High	
Within 250 m of a river	Very High	Very High	The study area is located within 250m of the Berg River.

2 PRELIMINARY FINDINGS

Visual Resource Management Africa CC (VRMA) was appointed by Cape EAPrac to undertake a **Visual Impact Assessment** for the proposed Vanderkloof Energy PV on behalf of Vanderkloof Energy PV (Pty) Ltd. A **site visit that was undertaken on the 9 April 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 DFFE Screening tool indicated Very High Landscape Sensitivity for the following landscapes:

- High Ridgelines and Mountains.
- Steep slopes.
- Within 250m of a river.

The finding of the site survey is that these landscape are applicable to the study area and do add value to the local and regional scenic quality. For this reason, they are deemed unsuitable for development and excluded as No-Go areas. The remaining areas do have some scenic value but are either visually compromised by the numerous Eskom powerlines that cross the shallow plateau area or are broadly undulating and offer medium levels of scenic quality. The area is remote, and while there are eco-tourism activities within the area, these activities are mainly outside of the zone of visual influence of the proposed PV landscape change. The access routes would pass through the PV development area, and as such 'walling' of PV structures and electric fences would need to be carefully considered to not 'box' in views or vistas of the adjacent mountains.

As there is sufficient space for PV related development after exclusion of the Very - High Landscape areas, the proposed development should not be viewed as a Fatal Flaw. The Luckhoff town is in poor management and the proposed Renewable Energy development is likely to significantly add socio-economic value to the town's residents. In order to ensure that the above-mentioned landscape and visual resources are not compromised, a Level 3 LVIA is required.

POLICY FIT

Medium Positive

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 Positive. While there is clear emphasis of the need for Renewable Energy projects, there is also a strong emphasis for tourism around the Vanderkloof Dam. While the dam and the surrounding mountainous terrain does create the opportunities for tourism, the project is area is located 18km to the north and outside of the Grasberg / Vanderkloof Zone of Visual Influence. However, it is likely that the Eco-Karoo Lodge will fall within the project ZVI and care would need to be taken to ensure that degradation of the visual resources used by this resort are not compromised. The town of Luckhoff reflects a state of planning decay and the development of a renewable energy facility in the region will add significant socio-economic value to this region.

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. To ensure the landscape and visual resources related to the area are not compromised, a Level 3 LVIA is required (Impacts without photomontages).

3 INTRODUCTION

The proposed development site is located in Free State Province, within the western extents of the Xhariep District Municipality. The Proponent proposes to construct a cluster of solar PV and BESS facilities on a site located 2.4 km (approx.) south of the small town of Luckhoff. This assessment is for the PV and BESS components only and does not include the grid connection.

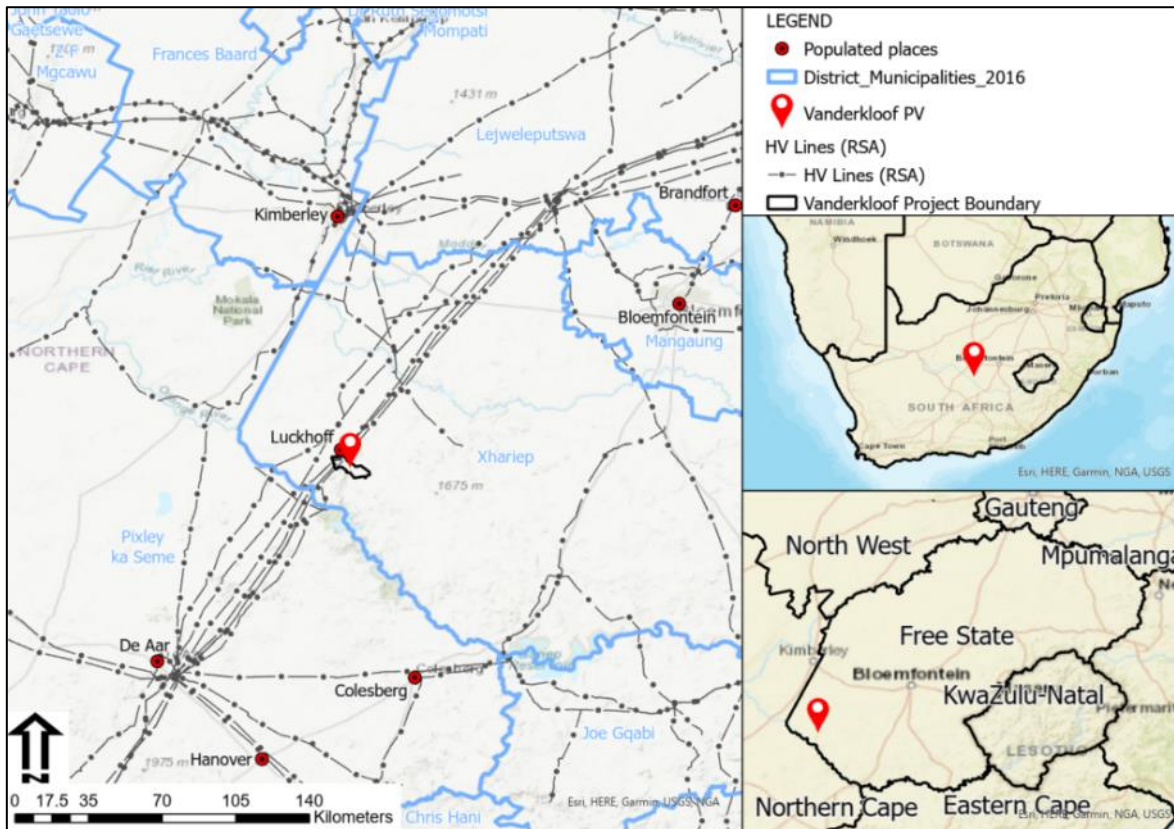


Figure 4: National and regional locality map.

3.1 Study Team

Contributors to this study are summarised in the table below.

Table 5: 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	<ul style="list-style-type: none"> 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.

3.2 Visual Assessment Approach

The full methodology used in the assessment can be found in Annexure B, 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 6: 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
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* 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.

3.3 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 7: 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 that these would be included in the project design, the Environmental Management Programme report (EMPr) and the authorisation conditions.

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

Criteria	Definition
<u>Extent</u>	The spatial or geographic area of influence of the visual impact, i.e.: <ul style="list-style-type: none"> • <i>site-related</i>: extending only as far as the activity. • <i>local</i>: limited to the immediate surroundings. • <i>regional</i>: affecting a larger metropolitan or regional area. • <i>national</i>: affecting large parts of the country. • <i>international</i>: affecting areas across international boundaries.

<u>Duration</u>	<p>The predicted life-span of the visual impact:</p> <ul style="list-style-type: none"> • <i>short term</i>, (e.g., duration of the construction phase). • <i>medium term</i>, (e.g., duration for screening vegetation to mature). • <i>long term</i>, (e.g., lifespan of the project). • <i>permanent</i>, where time will not mitigate the visual impact.
<u>Intensity</u>	<p>The magnitude of the impact on views, scenic or cultural resources.</p> <ul style="list-style-type: none"> • <i>low</i>, where visual and scenic resources are not affected. • <i>medium</i>, where visual and scenic resources are affected to a limited extent. • <i>high</i>, where scenic and cultural resources are significantly affected.
<u>Probability</u>	<p>The degree of possibility of the visual impact occurring:</p> <ul style="list-style-type: none"> • <i>improbable</i>, where the possibility of the impact occurring is very low. • <i>probable</i>, where there is a distinct possibility that the impact will occur. • <i>highly probable</i>, where it is most likely that the impact will occur. • <i>definite</i>, where the impact will occur regardless of any prevention measures.
<u>Significance</u>	<p>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:</p> <ul style="list-style-type: none"> • <i>low</i>, where it will not have an influence on the decision. • <i>medium</i>, where it should have an influence on the decision unless it is mitigated. • <i>high</i>, where it would influence the decision regardless of any possible mitigation.

3.5 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)

4 PROJECT DESCRIPTION

The following 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.

Table 9: Project Information Table

PROPONENT SPECIFICATIONS	
Applicant Details	Description
Applicant Name:	Vanderkloof Energy (Pty) Ltd
Project Name:	Vanderkloof Solar Energy PV and BESS Facility

The proposed project is expected include the following infrastructure:

Table 10: Project Description Table

Project components	Description
PV Array	<ul style="list-style-type: none"> • PV array related structures. • Substations. • Powerlines. • Road and infrastructure. • BESS • Laydown Areas • Auxiliary Buildings

The following photographs of existing solar PV developments depict landscape changes that could take place in relation to the proposed land use change.



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



(Junior Mining Network, n.d.)

Figure 5: Photographic example of what the proposed PV Array could look like as fixed and single portrait model on a tracker.



Figure 6. Example of a Photomontage of #Tesla BESS in landscape.



Cr: Relay and Power Systems (Green Building Africa, n.d.)

Figure 7. Example of what a small onsite substation could look like.

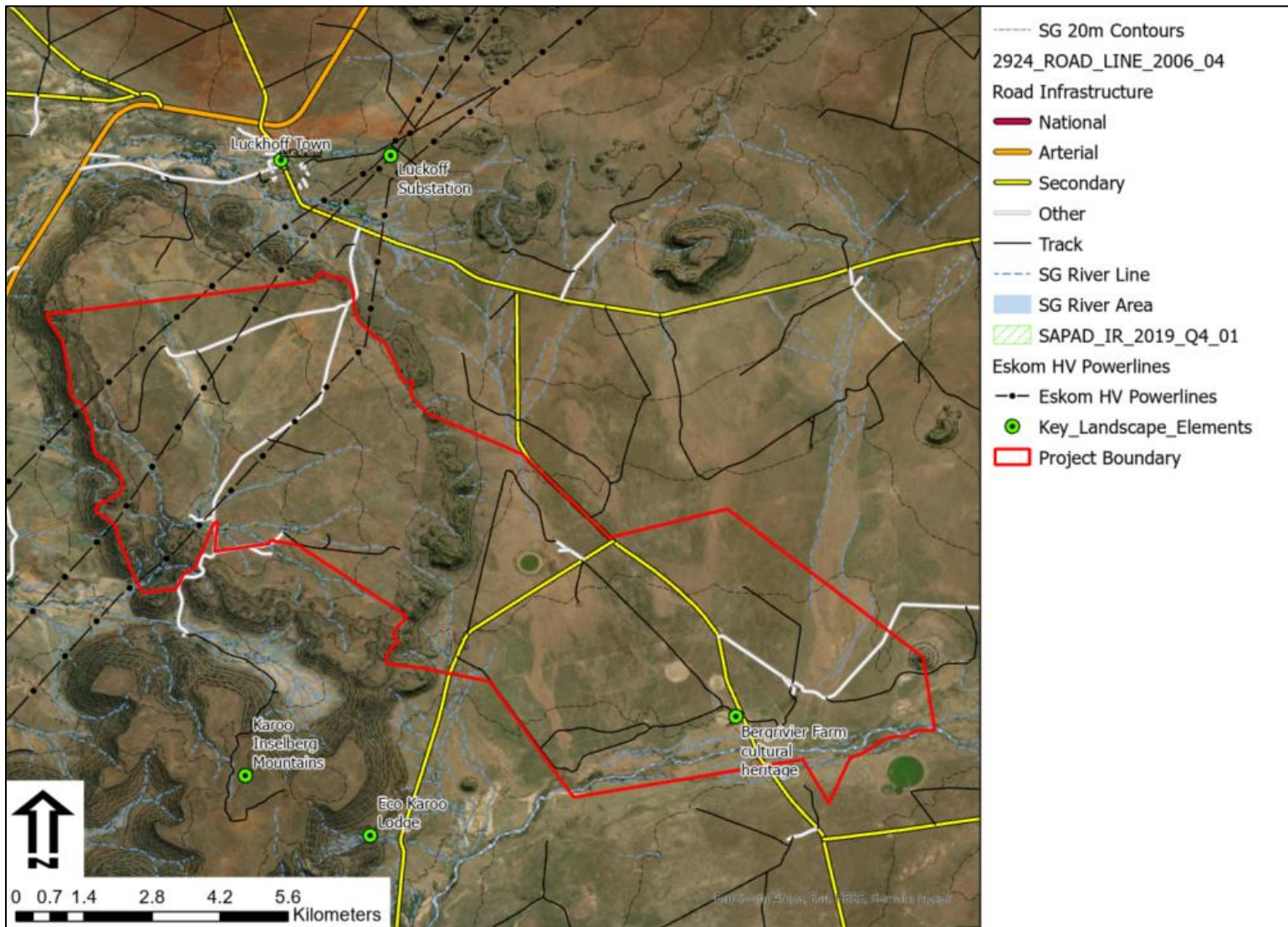


Figure 8: Proposed project area map.

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).

The Grasberg Nature Reserve is located 7km to the south of the project area where the proposed PV landscape change is unlikely to fall within the project Zone of Visual Influence due to the distance, and the undulating terrain.

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 International Landscape Value Summary

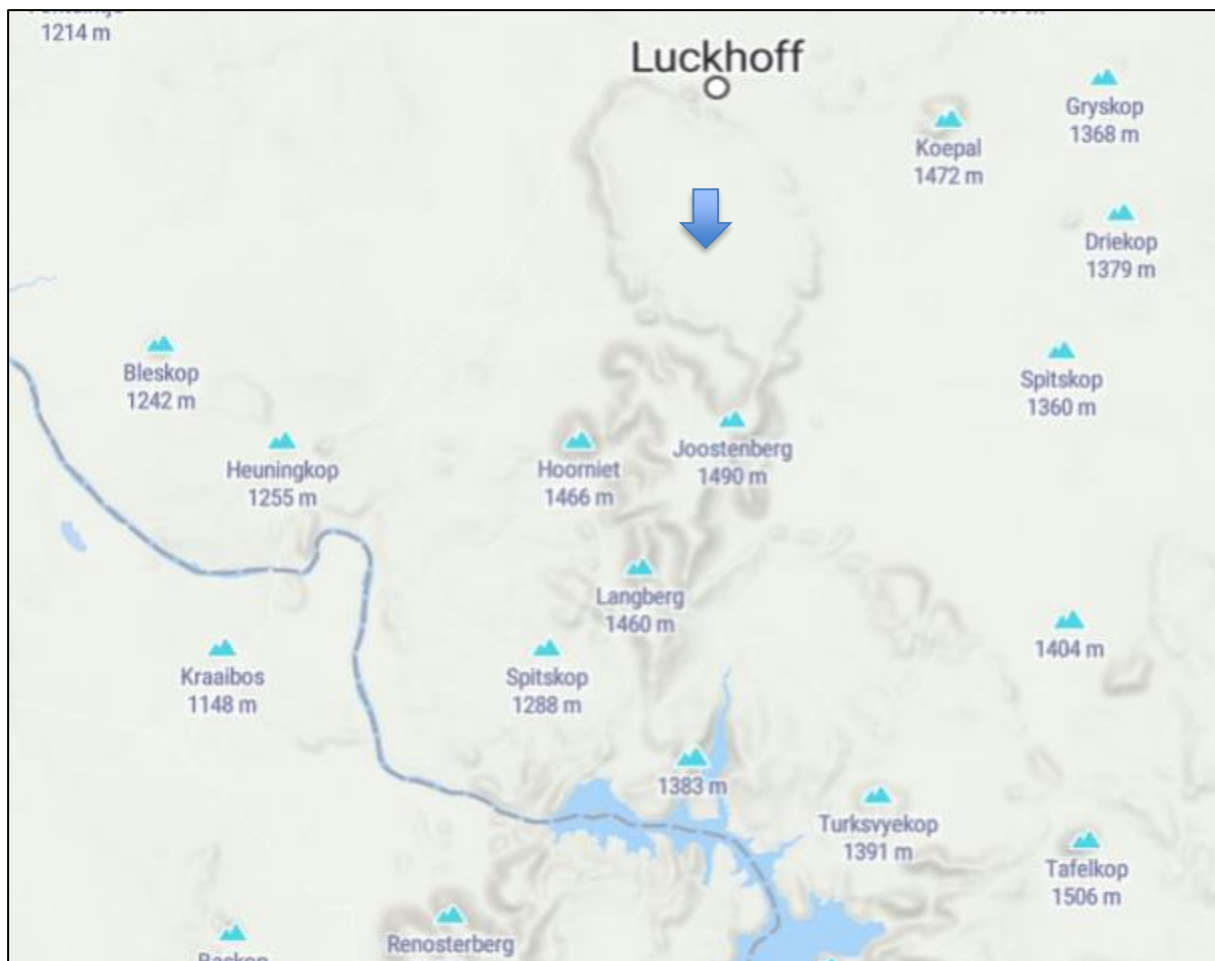


Figure 9: Extract from the Peakvisor website (www.peakvisor.com) with the shallow plateau indicated by the arrow.

The map in Figure 9 above is taken from the Peakvisor website. It is a website that identifies peak features in the world. The proposed development is located to the north of the Joostenberg and Hoorriet Peaks that forms part of the mountainous terrain around the Vanderkloof Dam. The topography of the northern section of the site is plateau related, raised above the surrounding terrain and inward draining. This does create a more unique landform in that the views from this area of contained by the surrounding high ground, and as such only reflect the extent of the plateau. In this sense, they could be deemed a natural resource base. In relation to the locality of the Vanderkloof Dam, this plateau feature could be deems a recreation resources. While these two aspects do hold true for the plateau area, they have degraded by man made modifications in the form of three 400kV powerlines that are routed through the plateau. **As the plateau area is relatively small, there is no portion of the plateau where the multiple powerlines would not be visible. As such, while the unique plateau landform could be a natural resource base, it is highly unlikely to become a valuable recreation resource due to the local landscape degradation. The actual plateau is also not a dominating landform in its own right with moderate scale and elevation.**

5.3 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 10 below.

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

Table 11: List of key planning informants to the project.

Theme	Requirements
Province	Free State
District Municipality	Xhariep
Local Municipality	Letsemeng
REDZ	Not applicable
Strategic Corridor	Central Powerline Corridor

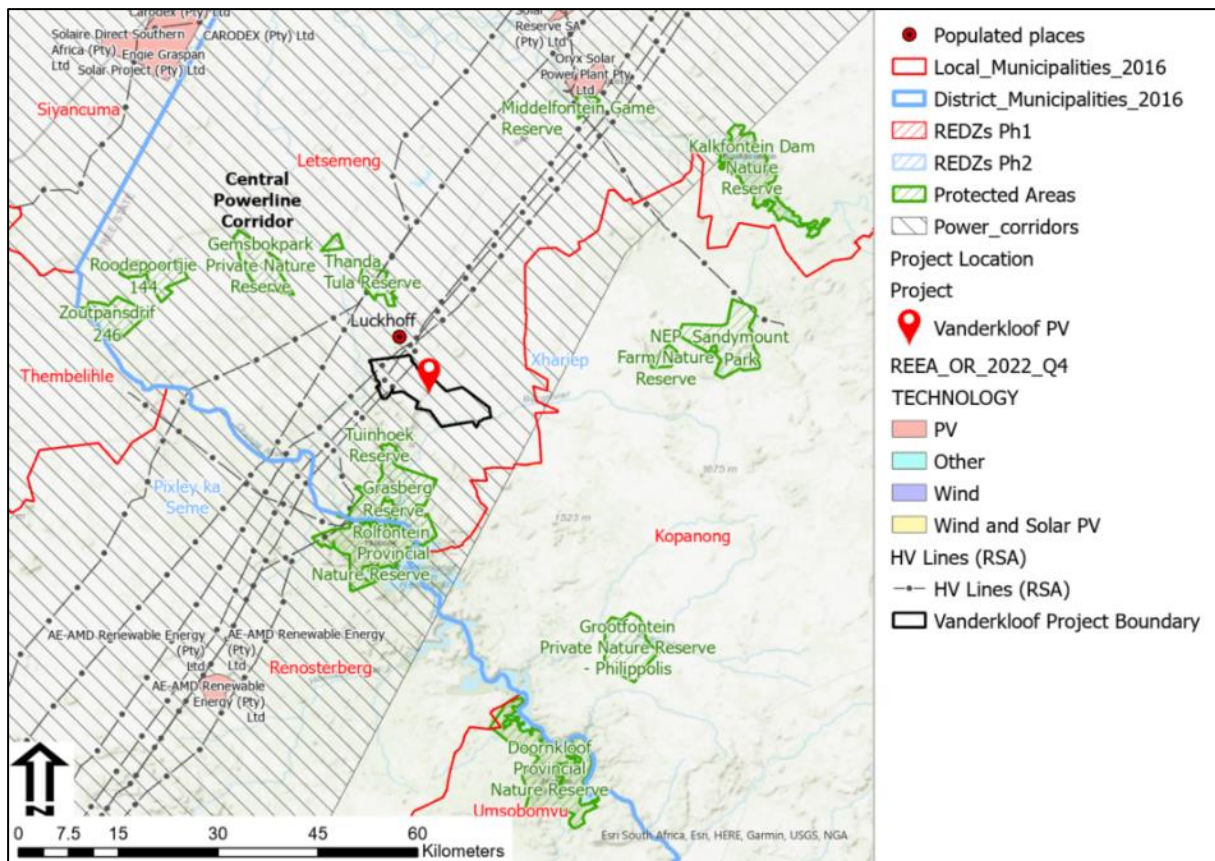


Figure 10: Planning locality map depicting the local, district and national planning zones.

5.3.1 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)

5.3.2 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 not within a proclaimed REDZ.**

5.3.3 Other Renewable Energy Projects

There are no other Renewable Energy projects within a 30km radius of the proposed project. Due to the undulation of the terrain, the proposed PV landscape change is unlikely to result in intervisibility such that a larger massing effect takes place that significantly degrades local landscape resources. **Risk to massing effects from intervisibility is thus rated Low.**

5.3.4 Conservation and Tourism Planning

As can be seen in Figure 10 above, numerous conservation areas and proclaimed reserves surround the site, with the closest Nature Reserve (NR) being the Grasberg which is located approx. 7km to the south. Given the regional proximity to the Vanderkloof Dam, with interesting undulating, mountainous terrain, the area does have potential for conservation. **However, due to the local degradation from the multiple powerlines, and the 19km distance from the Vanderkloof Dam, the ecotourism potential of the proposed study is limited. There are existing ecotourism activities in the area, namely the Eco Karoo lodge that is located 4km to the south of the project. While the PV landscape is unlikely to be visible as a dominating visual effect from the lodge, access to the lodge is through the study area where tourist receptors would be exposed to PV landscapes.**

5.3.5 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 12: Pixley ka Seme District Municipality IDP 2022
(Pixley ka Seme District Municipality, 2022)

Theme	Requirements	Page
Opportunities	<ul style="list-style-type: none"> Eco Tourism Solar and Wind Farms Position of being strategically situated (National Roads) SKA 	12
Biophysical Context	<ul style="list-style-type: none"> Possible demand for development that will influence the transformation of land uses SKA Renewable Energy 	34
Renewable Energy	Potential and impact of renewable energy resource generation	45
	South Africa has embarked in a process of diversifying its energy-mix to enhance energy security while also lowering green-house gas emissions. The country is blessed with a climate that allows Renewable Energy (RE) technologies like solar photovoltaic (PV) and wind generation to be installed almost anywhere in the country. By successfully attracting a share of the IPPPP portfolio investment, Emthanjeni, Siyathemba, Ubuntu and Renosterberg and Umsobomvu are all benefitting from substantial socio-economic development (SED) and Enterprise development (ED) contributions leveraged by the IPPPP commitments.	75

Table 13: Local Planning reference table relevant to the project.
(Letsemeng Integrated Development Plan, 2021)

Theme	Requirements	Page
Industry	<ul style="list-style-type: none"> It also identified Koffiefontein the main business and administrative hub of the Municipality and Luckhoff as an Agricultural Industry 	65
Energy Consumption	<ul style="list-style-type: none"> Transition to a low-carbon economy Speed Expand the public works programme up and expand renewable energy, waste recycling, ensure buildings meet energy efficient standards 	300
Renewable Energy	<ul style="list-style-type: none"> Goal 13 – Take urgent action to combat climate change and its impact by regulating emissions and promoting developments in renewable energy. 	307
Conservation	<ul style="list-style-type: none"> A number of game farms have been identified in Petrusburg, Luckhoff, Phillipolis and Bethulie. 	72
Tourism	<ul style="list-style-type: none"> Whilst the solar corridor concept is an important one and must play an important role in Letsemeng local economic development, some potential assets were not identified by the provincial SDF: <ul style="list-style-type: none"> Vanderkloof dam and the Rolfontein nature reserve as tourism node. 	65
	<ul style="list-style-type: none"> The Xhariep district is represented in a fitting global, national and provincial context which recognises the district as a key component due to its comparative and competitive advantages that include its scenery, agriculture and tourism opportunities and its international border with Lesotho 	68
	<ul style="list-style-type: none"> various areas adjacent to the rivers are well suited for tourism and agricultural development alike. These areas are however sensitive to over utilization and pollution and will have to be protected and conserved to ensure long term benefits thereof 	79
	<ul style="list-style-type: none"> The Municipal area has a significant weekend related tourism potential that could, in future, contribute to the GDP of the district and should be further explored. 	193

5.4 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 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 Positive. While there is clear emphasis of the need for Renewable Energy projects, there is also a strong emphasis for tourism around the Vanderkloof Dam. While the dam and the**

surrounding mountainous terrain does create the opportunities for tourism, the project area is located 18km to the north and outside of the Grasberg / Vanderkloof Zone of Visual Influence. However, it is likely that the Eco-Karoo Lodge will fall within the project ZVI and care would need to be taken to ensure that degradation of the visual resources used by this resort are not compromised. The town of Luckhoff reflects a state of planning decay and the development of a renewable energy facility in the region will add significant socio-economic value to this region.

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7 ANNEXURE A: SITE VISIT PHOTOGRAPHS AND COMMENTS

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

_ID	1
_REMARKS	R48 road view with no views of the proposed PV landscape
_REC_TIME	04/09/2024 08:13:50.999 GMT+02:00
_LATITUDE	-29.73870004
_LONGITUDE	24.76889715
_ELEVATION	1285.363
Risk	Low
PhotoDir	SE
Photo	\Photos\Vanderkloof PV_20240409_081414028.jpg



_ID	2
_REMARKS	Eskom powerline corridor
_REC_TIME	04/09/2024 08:19:13.999 GMT+02:00
_LATITUDE	-29.75656154
_LONGITUDE	24.79161591
_ELEVATION	1299.232
Risk	Low
PhotoDir	S
Photo	\Photos\Vanderkloof PV_20240409_081928268.jpg



_ID	3
_REMARKS	Eskom Luckoff substation
_REC_TIME	04/09/2024 08:20:41.614 GMT+02:00
_LATITUDE	-29.74708143
_LONGITUDE	24.80698172
_ELEVATION	0
Risk	Low
PhotoDir	N
Photo	\Photos\Vanderkloof PV_20240409_082108357.jpg



_ID	4
_REMARKS	Shallow basin plateau grasslands
_REC_TIME	04/09/2024 08:42:25.000 GMT+02:00
_LATITUDE	-29.77549198
_LONGITUDE	24.79575081
_ELEVATION	1351.181
Risk	Medium
PhotoDir	E
Photo	\Photos\Vanderkloof PV_20240409_084327802.jpg



_ID	5
_REMARKS	One of three 400kVEskom powerline corridor on the plateau.
_REC_TIME	04/09/2024 08:52:30.000 GMT+02:00
_LATITUDE	-29.77993155
_LONGITUDE	24.77984419
_ELEVATION	1335.81
Risk	Medium
PhotoDir	E
Photo	\Photos\Vanderkloof PV_20240409_085257769.jpg



_ID	6
_REMARKS	Drainage line
_REC_TIME	04/09/2024 08:57:50.000 GMT+02:00
_LATITUDE	-29.78181613
_LONGITUDE	24.76736718
_ELEVATION	1328.294
Risk	High
PhotoDir	S
Photo	\Photos\Vanderkloof PV_20240409_085824089.jpg



_ID	7
_REMARKS	Karoo inselberg type mountain features in background distance from site.
_REC_TIME	04/09/2024 08:59:44.252 GMT+02:00
_LATITUDE	-29.86173359
_LONGITUDE	24.78011772
_ELEVATION	0
Risk	Medium
PhotoDir	N
Photo	\Photos\Vanderkloof PV_20240409_090039877.jpg



_ID	8
_REMARKS	Western high ground ridgeline with powerlines in the foreground.
_REC_TIME	04/09/2024 09:02:57.906 GMT+02:00
_LATITUDE	-29.78931795
_LONGITUDE	24.74864233
_ELEVATION	0
Risk	High
PhotoDir	E
Photo	\Photos\Vanderkloof PV_20240409_090401444.jpg



_ID	9
_REMARKS	Eskom powerline corridor
_REC_TIME	04/09/2024 09:04:48.221 GMT+02:00
_LATITUDE	-29.77484046
_LONGITUDE	24.76985022
_ELEVATION	0
Risk	Medium
PhotoDir	NE
Photo	\Photos\Vanderkloof PV_20240409_090513388.jpg



_ID	10
_REMARKS	Farmstead (Proponent)
_REC_TIME	04/09/2024 09:17:33.613 GMT+02:00
_LATITUDE	-29.77873096
_LONGITUDE	24.78876013
_ELEVATION	0
Risk	Medium
PhotoDir	SE
Photo	\Photos\Vanderkloof PV_20240409_091800358.jpg



_ID	11
_REMARKS	Eskom powerline corridor
_REC_TIME	04/09/2024 09:27:51.999 GMT+02:00
_LATITUDE	-29.79049213
_LONGITUDE	24.79442701
_ELEVATION	1339.848
Risk	Low
PhotoDir	S
Photo	\Photos\Vanderkloof PV_20240409_092807883.jpg



_ID	12
_REMARKS	Mountainous terrain foothills of high scenic quality
_REC_TIME	04/09/2024 09:36:11.366 GMT+02:00
_LATITUDE	-29.81787221
_LONGITUDE	24.78031084
_ELEVATION	0
Risk	High
PhotoDir	N
Photo	\Photos\Vanderkloof PV_20240409_093749411.jpg



_ID	13
_REMARKS	Western high ground ridgeline
_REC_TIME	04/09/2024 09:38:26.833 GMT+02:00
_LATITUDE	-29.79790097
_LONGITUDE	24.81230222
_ELEVATION	0
Risk	High
PhotoDir	E
Photo	\Photos\Vanderkloof PV_20240409_093938325.jpg



_ID	14
_REMARKS	Subsistence farmer within proposed powerline survey area.
_REC_TIME	04/09/2024 09:51:36.078 GMT+02:00
_LATITUDE	-29.76649528
_LONGITUDE	24.79697809
_ELEVATION	0
Risk	High
PhotoDir	W
Photo	\Photos\Vanderkloof PV_20240409_095224853.jpg



_ID	15
_REMARKS	Subsistence farmer
_REC_TIME	04/09/2024 09:53:25.449 GMT+02:00
_LATITUDE	-29.76688033
_LONGITUDE	24.79844123
_ELEVATION	0
Risk	High
PhotoDir	W
Photo	\Photos\Vanderkloof PV_20240409_095350810.jpg



_ID	16
_REMARKS	Drainage line
_REC_TIME	04/09/2024 09:56:10.798 GMT+02:00
_LATITUDE	-29.75893004
_LONGITUDE	24.80286218
_ELEVATION	0
Risk	High
PhotoDir	N
Photo	\Photos\Vanderkloof PV_20240409_095633229.jpg



_ID	17
_REMARKS	Eskom powerline corridor
_REC_TIME	04/09/2024 09:57:57.999 GMT+02:00
_LATITUDE	-29.76197438
_LONGITUDE	24.80482055
_ELEVATION	1324.825
Risk	Low
PhotoDir	S
Photo	\Photos\Vanderkloof PV_20240409_095816351.jpg



_ID	18
_REMARKS	Ridgeline / Skyline intrusion
_REC_TIME	04/09/2024 10:00:03.951 GMT+02:00
_LATITUDE	-29.7793214
_LONGITUDE	24.80285179
_ELEVATION	0
Risk	High
PhotoDir	N
Photo	\Photos\Vanderkloof PV_20240409_100059922.jpg



_ID	19
_REMARKS	S132 gravel road receptor
_REC_TIME	04/09/2024 10:08:57.999 GMT+02:00
_LATITUDE	-29.80403893
_LONGITUDE	24.83335796
_ELEVATION	1322.568
Risk	High
PhotoDir	SW
Photo	\Photos\Vanderkloof PV_20240409_100935350.jpg



_ID	20
_REMARKS	Flat Nama-karoo grassland
_REC_TIME	04/09/2024 10:15:44.210 GMT+02:00
_LATITUDE	-29.82965572
_LONGITUDE	24.85044859
_ELEVATION	0
Risk	Medium
PhotoDir	N
Photo	\Photos\Vanderkloof PV_20240409_101722439.jpg



_ID	21
_REMARKS	Mountainous terrain foothills of high scenic quality
_REC_TIME	04/09/2024 10:21:24.000 GMT+02:00
_LATITUDE	-29.8339325
_LONGITUDE	24.82349573
_ELEVATION	1304.577
Risk	High
PhotoDir	SW
Photo	\Photos\Vanderkloof PV_20240409_102214094.jpg



_ID	22
_REMARKS	KOP Eco- karoo access road northbound
_REC_TIME	04/09/2024 10:31:01.999 GMT+02:00
_LATITUDE	-29.86747932
_LONGITUDE	24.81076122
_ELEVATION	1269.896
Risk	Medium
PhotoDir	N
Photo	\Photos\Vanderkloof PV_20240409_103142455.jpg



_ID	23
_REMARKS	Skyline intrusion as seen from lower lying road
_REC_TIME	04/09/2024 10:36:23.155 GMT+02:00
_LATITUDE	-29.84592394
_LONGITUDE	24.82888162
_ELEVATION	0
Risk	High
PhotoDir	NE
Photo	\Photos\Vanderkloof PV_20240409_103741119.jpg



_ID	24
_REMARKS	Mountainous terrain foothills of high scenic quality
_REC_TIME	04/09/2024 10:46:32.000 GMT+02:00
_LATITUDE	-29.8249868
_LONGITUDE	24.81968883
_ELEVATION	1322.872
Risk	High
PhotoDir	S
Photo	\Photos\Vanderkloof PV_20240409_104647630.jpg



_ID	25
_REMARKS	Mountainous terrain foothills of high scenic quality
_REC_TIME	04/09/2024 10:59:31.999 GMT+02:00
_LATITUDE	-29.81981255
_LONGITUDE	24.80760593
_ELEVATION	1351.261
Risk	High
PhotoDir	SW
Photo	\Photos\Vanderkloof PV_20240409_105957323.jpg



_ID	26
_REMARKS	Dry stone wall heritage
_REC_TIME	04/09/2024 11:11:20.999 GMT+02:00
_LATITUDE	-29.82274692
_LONGITUDE	24.81272942
_ELEVATION	1341.214
Risk	High
PhotoDir	S
Photo	\Photos\Vanderkloof PV_20240409_111153001.jpg



_ID	27
_REMARKS	33kv powerline
_REC_TIME	04/09/2024 11:23:32.999 GMT+02:00
_LATITUDE	-29.8220009
_LONGITUDE	24.8423286
_ELEVATION	1304.155
Risk	Low
PhotoDir	SE
Photo	\Photos\Vanderkloof PV_20240409_112413092.jpg



_ID	28
_REMARKS	Low Ridgeline/ skyline intrusion
_REC_TIME	04/09/2024 11:26:48.931 GMT+02:00
_LATITUDE	-29.82433061
_LONGITUDE	24.85800806
_ELEVATION	0
Risk	High
PhotoDir	SE
Photo	\\Photos\Vanderkloof PV_20240409_112707618.jpg



_ID	29
_REMARKS	Shallow gradient grasslands
_REC_TIME	04/09/2024 11:29:03.388 GMT+02:00
_LATITUDE	-29.82031099
_LONGITUDE	24.86819845
_ELEVATION	0
Risk	Medium
PhotoDir	NE
Photo	\\Photos\Vanderkloof PV_20240409_113039380.jpg



_ID	30
_REMARKS	Farmstead
_REC_TIME	04/09/2024 11:40:19.000 GMT+02:00
_LATITUDE	-29.8459832
_LONGITUDE	24.8830602
_ELEVATION	1287.651
Risk	High
PhotoDir	N
Photo	\Photos\Vanderkloof PV_20240409_114044128.jpg



_ID	31
_REMARKS	Low lying drainage
_REC_TIME	04/09/2024 11:42:46.290 GMT+02:00
_LATITUDE	-29.84154079
_LONGITUDE	24.88772728
_ELEVATION	0
Risk	High
PhotoDir	NW
Photo	\Photos\Vanderkloof PV_20240409_114305684.jpg



_ID	32
_REMARKS	Spitzkop hill feature
_REC_TIME	04/09/2024 11:44:48.353 GMT+02:00
_LATITUDE	-29.83973391
_LONGITUDE	24.90446191
_ELEVATION	0
Risk	High
PhotoDir	E
Photo	\Photos\Vanderkloof PV_20240409_114515552.jpg




_ID	33
_REMARKS	Bergrivier Farm cultural heritage
_REC_TIME	04/09/2024 11:54:13.999 GMT+02:00
_LATITUDE	-29.85062659
_LONGITUDE	24.87207658
_ELEVATION	1280.337
Risk	High
PhotoDir	W




_ID	34
_REMARKS	Berg River
_REC_TIME	04/09/2024 11:56:47.999 GMT+02:00
_LATITUDE	-29.85824686
_LONGITUDE	24.87511228
_ELEVATION	1273.99
Risk	High
PhotoDir	N
Photo	\\Photos\Vanderkloof PV_20240409_115703044.jpg



_ID	35
_REMARKS	Low lying flood plains
_REC_TIME	04/09/2024 11:58:29.678 GMT+02:00
_LATITUDE	-29.85705659
_LONGITUDE	24.86937024
_ELEVATION	0
Risk	High

PhotoDir	W
Photo	\Photos\Vanderkloof PV_20240409_115852448.jpg
	

_ID	36
_REMARKS	Shallow gradient grasslands along the Berg River with mountain in the background.
_REC_TIME	04/09/2024 12:11:18.634 GMT+02:00
_LATITUDE	-29.85669457
_LONGITUDE	24.84844331
_ELEVATION	0
Risk	Medium
PhotoDir	SW
Photo	\Photos\Vanderkloof PV_20240409_121225145.jpg
	

_ID	37
_REMARKS	Centre pivots irrigation
_REC_TIME	04/09/2024 12:17:48.000 GMT+02:00
_LATITUDE	-29.84155291
_LONGITUDE	24.86253637

_ELEVATION	1283.021
Risk	High
PhotoDir	W
Photo	\Photos\Vanderkloof PV_20240409_121813049.jpg



_ID	38
_REMARKS	KOP Farm road northbound
_REC_TIME	04/09/2024 12:26:58.999 GMT+02:00
_LATITUDE	-29.84352659
_LONGITUDE	24.86894139
_ELEVATION	1288.531
Risk	Medium
PhotoDir	N
Photo	\Photos\Vanderkloof PV_20240409_122736323.jpg



_ID	39
_REMARKS	Prominent ridgeline on plateau area.
_REC_TIME	04/09/2024 12:47:46.000 GMT+02:00
_LATITUDE	-29.77563251
_LONGITUDE	24.7986802
_ELEVATION	1359.461
Risk	High
PhotoDir	E
Photo	\Photos\Vanderkloof PV_20240409_124758516.jpg



_ID	40
_REMARKS	Rocky outcrops for exclusion.
_REC_TIME	04/09/2024 12:50:20.000 GMT+02:00
_LATITUDE	-29.78252351
_LONGITUDE	24.79636293
_ELEVATION	1353.909
Risk	High
PhotoDir	W
Photo	\Photos\Vanderkloof PV_20240409_125030078.jpg



_ID	41
_REMARKS	Shallow gradient karoo scrub
_REC_TIME	04/09/2024 13:01:51.999 GMT+02:00
_LATITUDE	-29.80131201
_LONGITUDE	24.78159954
_ELEVATION	1322.167
Risk	Medium
PhotoDir	S
Photo	\Photos\Vanderkloof PV_20240409_130234628.jpg



_ID	42
_REMARKS	Mountain context setback
_REC_TIME	04/09/2024 13:05:54.999 GMT+02:00
_LATITUDE	-29.81037436
_LONGITUDE	24.77464541
_ELEVATION	1302.002
Risk	High
PhotoDir	S
Photo	\Photos\Vanderkloof PV_20240409_130607812.jpg



_ID	43
_REMARKS	Rocky outcrop
_REC_TIME	04/09/2024 13:06:57.730 GMT+02:00
_LATITUDE	-29.80985964
_LONGITUDE	24.76941403
_ELEVATION	0
Risk	High
PhotoDir	W
Photo	\Photos\Vanderkloof PV_20240409_130719473.jpg



_ID	44
_REMARKS	Ridgeline prominence and regional elevation not suitable for development.
_REC_TIME	04/09/2024 13:24:05.999 GMT+02:00
_LATITUDE	-29.78950133
_LONGITUDE	24.80899778
_ELEVATION	1373.247
Risk	High
PhotoDir	S
Photo	\Photos\Vanderkloof PV_20240409_132418942.jpg



_ID	45
_REMARKS	Dam in drainage line in OHPL survey area for exclusion
_REC_TIME	04/09/2024 14:37:37.559 GMT+02:00
_LATITUDE	-29.75678781
_LONGITUDE	24.7985626
_ELEVATION	0
Risk	High
PhotoDir	N
Photo	\Photos\Vanderkloof PV_20240409_143753445.jpg



_ID	46
_REMARKS	Luckhoff town
_REC_TIME	04/09/2024 14:42:02.000 GMT+02:00
_LATITUDE	-29.74792865
_LONGITUDE	24.78669413
_ELEVATION	1305.916
Risk	Low
PhotoDir	E
Photo	\Photos\Vanderkloof PV_20240409_144228507.jpg



8 ANNEXURE B: SPECIALIST INFORMATION

8.1 Professional Registration Certificate



8.2 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:** 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
 - MSc Geography, University of KwaZulu, Natal (2023)
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:**
 - International Geographical Congress, Lisbon (2017)
 - IAIAAsa 2012
 - IAIAAsa 2011
 - IAIA International 2011 (Mexico)
 - IAIAAsa 2010
 - IAIAAsa 2009
 - IAIAAsa 2007
11. **Continued Professional Development:**
 - Integrating Sustainability with Environment Assessment in South Africa (IAIAAsa 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:

Table 14: VRM Africa Projects Assessments Table

DESCRIPTION	COUNT	DESCRIPTION	COUNT
Dam	1	UISP	8
Mari-culture	1	Structure	8
Port	1	OHPL	12
Railway	1	Industrial	12
Power Station	3	Wind Energy	22
Hydroelectric	4	Battery Storage	14
Resort	4	Mine	20
Golf/Residential	1	Residential	45
Road Infrastructure	5	Solar Energy	62
Substation	5	TOTAL	237

9 ANNEXURE C: METHODOLOGY DETAIL

9.1 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.

9.1.1 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.

9.1.2 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.

9.1.3 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:

- Foreground / Middle ground**, up to approximately 6km, which is where there is potential for the sense of place to change.
- 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
- 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.

9.1.4 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.

9.2 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.

9.2.1 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.

9.2.2 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).