MULILO DE AAR PV

Mulilo De Aar PV : Application for Amendment of the Environmental Authorisation issued on 9 July 2012 for the 100MW PV Solar Energy Facility on the Remainder of Portion 1 of the Farm De Aar No 180 within the Emthanjeni Local Municipality near De Aar in the Northern Cape Province.

Visual Statement

Draft v_2

DATE: 25 July 2022

Document prepared for Landscape Dynamics (Pty) Ltd
On behalf of Mulilo (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

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

1.1 Specialist declaration of independence

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

1.2 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.

The topography of the area is relatively flat; although there are a few ridge-shaped hills and larger flatter plateaus receiving landscape that are likely to extend the visibility of the proposed development. The current land use is grassland agriculture. Other than the Eskom powerline adjacent to the site, no further man-made modifications were identified on the site. The current grasslands landscape reduces the visual absorption capacity, but the site is surroundedby an authorised/ unbuilt PV project, which will increase the ability of the receiving landscape to visually absorb the proposed PV landscape change.

As can be seen in the map below, the DFFE SSV rating is Medium. Due to the flat terrain, the lack of unique landscape resources and the built nature of De Aar, the expected sensitivity to landscape change is rated Medium to Low.

MAP OF RELATIVE LANDSCAPE (SOLAR) THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Between a and 2 km of a town or village

Figure 1. DFFE SSV mapping for solar PV.

2 EXECUTIVE SUMMARY

Visual Resource Management Africa CC (VRMA) was appointed by Landscape Dynamics (Pty) Ltd (LD) to undertake a **Visual Statement** for the Mulilo De Aar PV : Application for Amendment of the Environmental Authorisation issued on 9 July 2012 for the 100MW PV Solar Energy Facility on the Remainder of Portion 1 of the Farm De Aar No 180 within the Emthanjeni Local Municipality near De Aar in the Northern Cape Province.

The following parameters inform the visual statement Terms of Reference. **The Solar PV projects are authorised, and impacts defined in the original VIA have been assessed as per the following impact assessment report undertaken by Karen Hansen (KH) in the following Visual Impact Assessment:**

- PROPOSED PHOTO-VOLTAIC FACILITIES NEAR DE AAR, N CAPE: PAARDE VALLEY, BADENHORST DAM, ANNEX DU PLESSIS (Level 3 Visual Impact Assessment)

DEA REF NR: 12/12/20/2500
DEA REF NR: 12/12/20/2499

The finding from the Karen Hansen VIA is that:

- "the overall visual impact of the proposed developments would be moderate, due to the scale of the development, the numbers and types of receptors directly affected, and the shielding by built form. It was noted that the semi-industrial nature of a PVF was not incompatible with the industrial uses locally and the transmission lines. A number of mitigation measures was proposed which could moderate that visual impact" (KH).
- "The solar arrays will be close to De Aar, but the scale of the landscape is sufficient to provide a setting for these developments as they are widely spaced, and the area is already partly industrialised" (KH).

Further to the KH assessment, the author undertook the Basic VIA for the Badenhorst Dam PV BESS located directly adjacent to the Mulilo De Aar PV site, with a site visit undertaken on the 27 June 2020. This visual statement draws from the combined reports.

The findings of this visual statement, based on the review of the KH VIA report, as well as a site visit to undertake a basic visual assessment of the Badenhorst Dam PV BESS located adjacent to this site, is that the KH findings are still valid, and that Visual Impacts are likely to be Moderate. **The environment has not changed significantly since 2012; therefore, there is no objection to the extension of the validity of the Environmental Authorisation**

POLICY FIT **Positive High**

In terms of the spatial planning defined for the area, the proposed project has a good policy fit. The project will contribute to economic growth and diversification, social development projects, economic development in the region, sustainable development and affordable energy without detracting from significant natural or cultural landscapes. The project has a good policy fit in terms of landscape planning as the area has been identified as a renewable energy development area.

ZONE OF VISUAL INFLUENCE **No change**

The visible extent, or viewshed, is “the outer boundary defining a view catchment area, usually along crests and ridgelines” (Oberholzer, 2005). No change to the PV panel heights have been made and as such, the viewshed would remain the same.

RECEPTORS AND KEY OBSERVATION POINTS **No change**

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. As the ZVI remains the same, no change to the receptors and Key Observation Points (identified in the original assessment) is expected. No new receptors were identified.

SCENIC QUALITY **No change**

The Terms of Reference for the Visual Statement do not include an impact assessment of the Scenic Quality. However, as the degree of change to the PV panels placement is approximately the same, no change in impact to the Scenic Quality is expected. No changes to the Scenic Quality were identified in the more recent BESS survey (adjacent to the site), or from the desktop mapping.

RECEPTOR SENSITIVITY TO LANDSCAPE CHANGE **Low**

As indicated in the KH report, receptors are limited but could include the N10 (Medium Exposure) as well as the outer dwellings of Happy Valley and Nonzwakazi (Low Exposure). While no impact rating was defined in the KH report, the receptor sensitivity is likely to be Low as landscape resources are minimal, there are not tourism activities making use of the site landscape resources, and the VAC levels of higher due to the powerline corridors and close proximity to the Eskom Substation.

EXPECTED IMPACT SIGNIFICANCE

Medium	**No change to the KH impact statement** “the study concluded that the overall visual impact of the proposed developments would be moderate, due to the scale of the development, the numbers and types of receptors directly affected, and the shielding by built form. A number of mitigation measures was proposed which could moderate that visual impact” (KH)

CUMULATIVE EFFECTS

Medium	**No change to the KH impact statement** "the local landscape character is changed; the cumulative impact is assessed as medium for both magnitude and significance" (KH).

3 INTRODUCTION

The proposed project is located in the Western Cape Province near the town of De Aar in the Northern Cape Province, South Africa. The following table identifies the property reference.

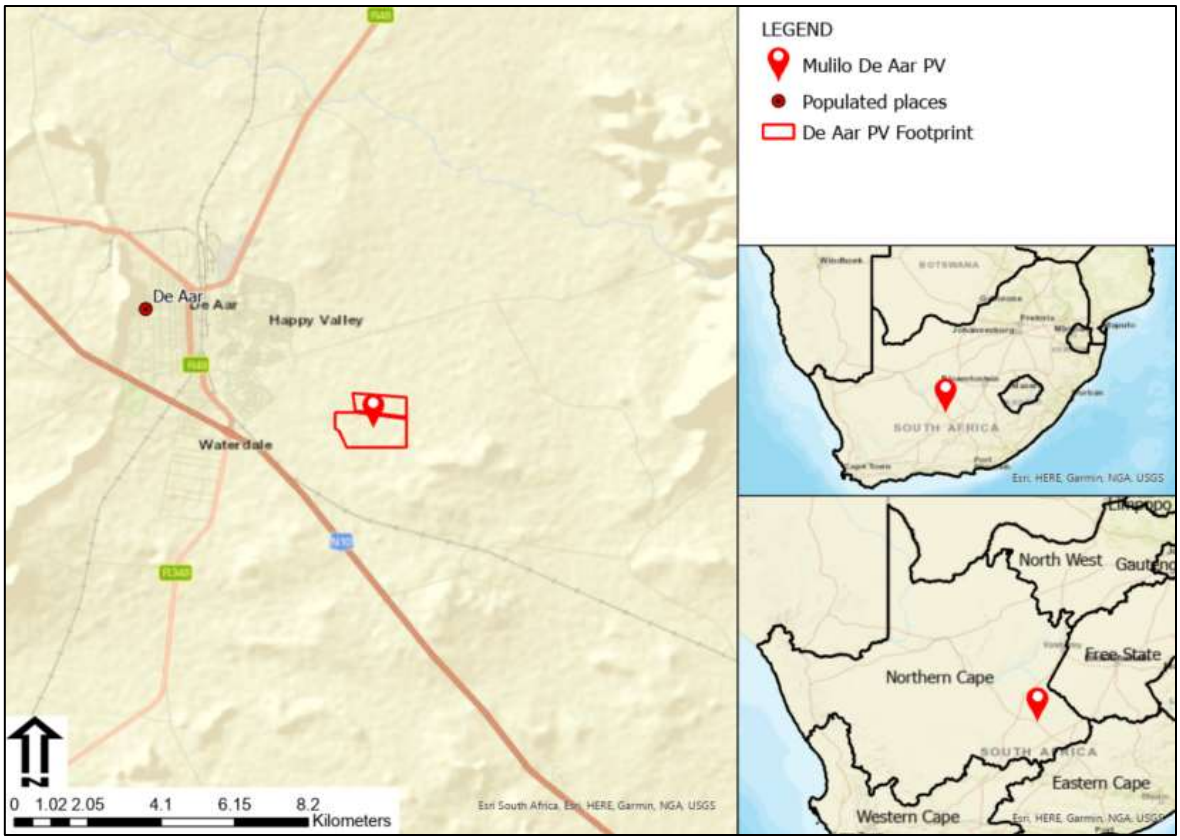

Figure 2: National and regional locality map.

3.1 Terms of Reference

VRMA was awarded the contract to undertake a Visual Statement for the above-mentioned project assessment with the following requirements:

- Review broad landscape and visual criteria that could influence any changes in the impact ratings originally undertaken for the De Aar PV project assessment.
- Make recommendations on further mitigations if deemed relevant.

3.2 Study Team

Contributors to this study are summarised in the table below.

Table 2: 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 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).

3.3.1 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 3: 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, as well as alignment with strategic planning documents such as Policy Guidelines, Strategic Environmental Assessments, Spatial Development Frameworks.
Identifying Visual Issues	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.

3.3.2 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.

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 4: Project Information Table

PROPONENT SPECIFICATIONS	
Applicant Details	**Description**
Applicant Name:	Mulilo
Project Name:	De Aar PV
Property Details:	Badenhorst Dam farm (Farm No. 180 Portion 1)

Mulilo De Aar PV appointed Landscape Dynamics to undertake an application for amendment of the Environmental Authorisation issued on 9 July 2012 for the 100MW PV Solar Energy Facility on the Remainder of Portion 1 of the Farm De Aar No 180 within the Emthanjeni Local Municipality near De Aar in the Northern Cape Province.

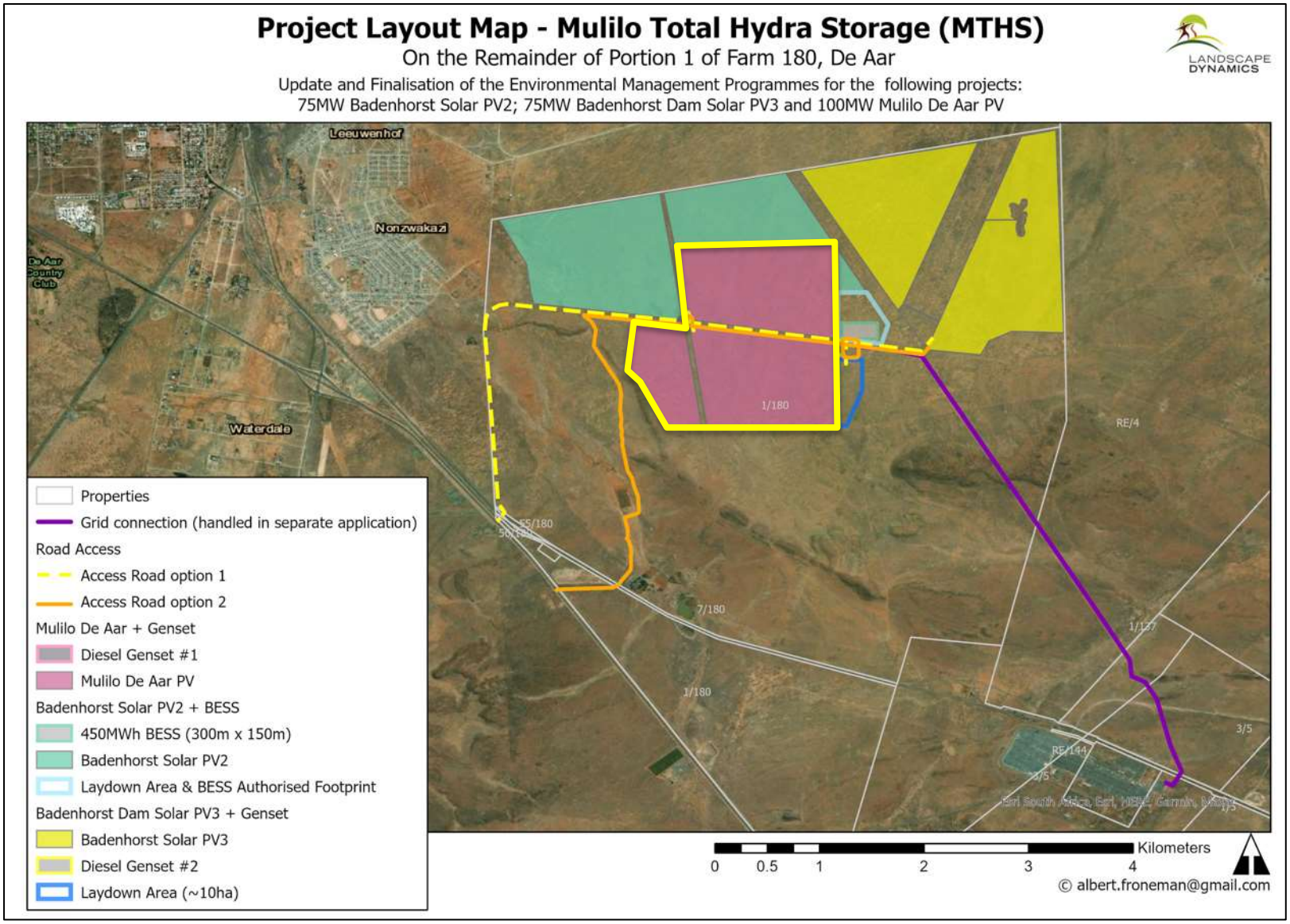

Figure 3: Proposed layout plan map for Mulilo Total Hydra Storage (MTHS) and the Mulilo De Aar PV pertaining to this visual statement (yellow).

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 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.

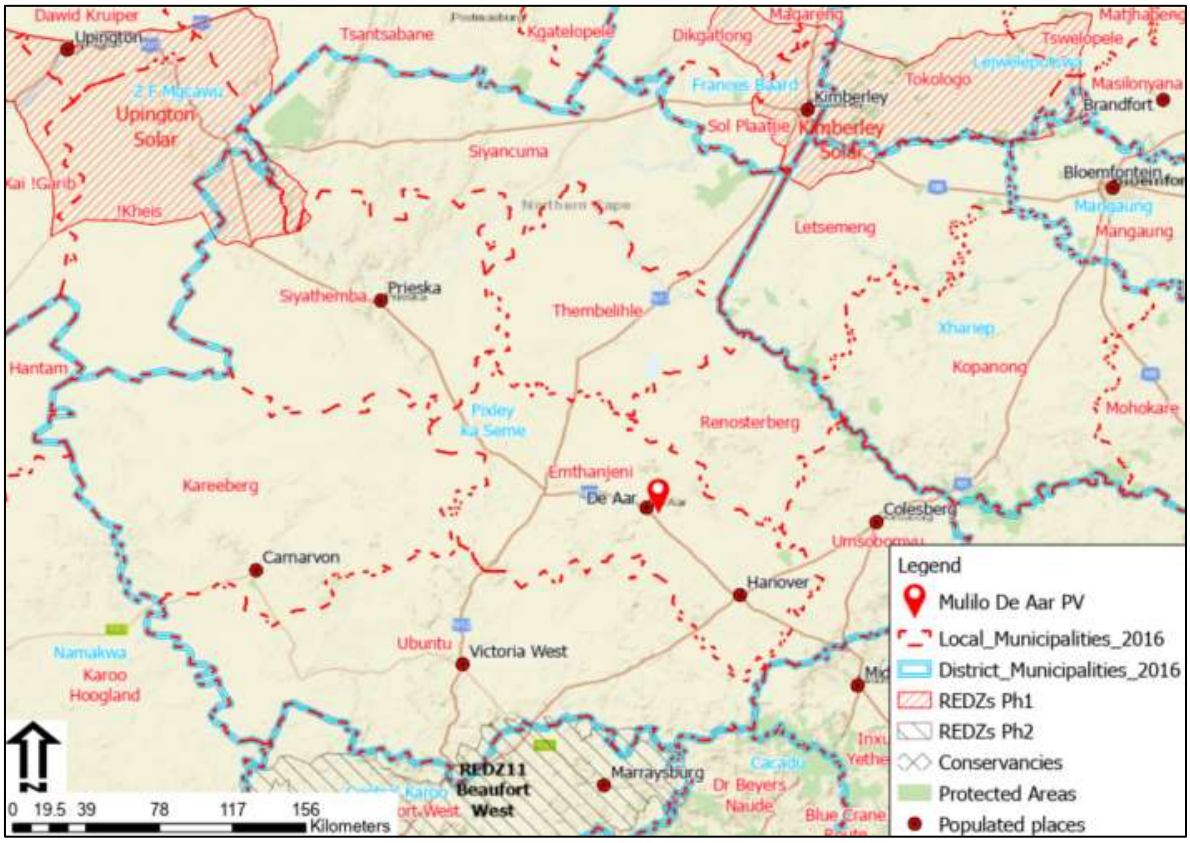

Figure 4. Planning authority locality map.

5.1 National Legislation and Policies

In order to comply with the Visual Resource Management requirements, it is necessary to clarify which National and Regional planning guidelines 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. The following policies pertaining to planning, landscapes and tourisms are listed below:

Table 5: Planning and Governance Landscape and Tourism Issues Table.

Legislation	Reference	Page Reference
Emthanjeni Municipality IDP 2007 (Emthanjeni,	Mission: To create a viable economic development plan that is relevant to the characteristics of the Emthanjeni Municipal area, designed to create and maintain a sound and healthy local economy, drawing	Pg 33/34

Legislation	Reference	Page Reference
Enthanjeni Municipality IDP, 2007)	upon local strengths and resources. Vision: “Leading sustainable development for inclusive economic growth”.	
	Emthanjeni has in recent time seen the influx of investment in Renewable energy projects and is a potential industrial growth point with ample industrial sites, reasonable prices and tariffs, affordable labour and the necessary infrastructure. De Aar is therefore the ideal place to establish industries, a fact which can be borne out by various major industries which have already established themselves here. The central location and excellent rail and road links have resulted in several chain stores opening branches.	Pg 46
	Other future planning and projects which Emthanjeni also concentrates on to increase Economic Development are: Development of N10 Corridor, linked to the National Solar Corridor (Northern Cape) These thrusts are aimed at exploring the potential of Emthanjeni Local Municipality to become a leading tourism destination	Pg 56
Emthanjeni Municipality Spatial Development Framework (SDF)	It is the intention of the SDF to arrange development activities and the built environment in such a way and manner that it can accommodate and implement ideas and desires of people without compromising the natural environment. (Emthanjeni, Emthanjeni Municipality Spatial Development Framework (SDF), 2007)	Pg 1
	It is proposed that the industrial development must continue in a northerly direction, alongside the railway lines.	Pg 31
	It is proposed that the area north of the N10 route be used for residential development, but that the area south of the N10 route still keeps its agricultural character	Pg 47
Northern Cape Province (NCP) Provincial Growth and Development Strategy (2004-2014)	The vision of the NCPGDS is to build a prosperous, sustainable, growing provincial economy to eradicate poverty and improve social development for a caring society and it rests on six pillars • Ensure availability of affordable energy. • Trade development and promotion. • Enterprise development and broad-based economic empowerment. • Regional and local economic development. • Environmental and sustainable development (Northern Cape, Northern Cape Province (NCP) Provincial Growth and Development Strategy (2004-2014), 2012)	
Northern Cape Provincial SDF (2012)	Aesthetically prominent natural features or areas should be declared Protected Natural Environments if such declaration would promote natural scenic beauty or biodiversity. No development must be allowed in proclaimed Protected Natural Environments. Promote the development of renewable energy supply schemes. Large-scale renewable energy supply schemes are strategically important for increasing the diversity of domestic energy supplies and avoiding energy imports, while minimizing detrimental	

Legislation	Reference	Page Reference
	environmental impacts. The construction of energy infrastructure must be strictly regulated in terms of the spatial plans and guidelines put forward in the Provincial SDF (PSDF). They must be carefully placed to avoid visual impacts on landscapes of significant symbolic, aesthetic, cultural or historic value and should blend in with the surrounding environment to the extent possible. *(C8.3.3 Energy Policy, Pg 141).* (Northern Cape, Northern Cape Province SDF, 2012)	

5.2 Policy Fit Statement

In terms of the spatial planning defined for the area, the proposed project has a positive policy fit from the visual and landscape perspective. Although not located within a REDZ, the project will contribute to economic growth and diversification, social development projects, economic development in the region, sustainable development and affordable energy in an area that has been identified as a renewable energy locality. The site ZVI does not include any significant landscape resources, and the main receptors are moderately set back from the PV development such that visual intrusion is likely to be experienced as Low.

6 LANDSCAPE CONTEXT

The proposed site for the construction is Badenhorst Dam Farm (Farm No. 180 Portion 1). Badenhorst Dam farm is approximately 1 310ha in extent and is zoned as agricultural land. “De Aar is a declared industrial growth node in the Northern Cape as it is centrally located with excellent rail and road links**.** De Aar is the second most important railway junction in the country as it is central to Gauteng, Cape Town, Port Elizabeth and Namibia. The industrial area of De Aar is located to the eastern side of the railway lines, north-east of the CBD of the town. This area was developed in this specific location, due to the development potential the railway intersections in De Aar provided”. (Emthanjeni, Emthanjeni Municipality Spatial Development Framework (SDF), 2007). The existing landscape character has been shaped historically by the uniform nature of the flat Nama Karoo plains with typical semi-desert and desert climatic conditions. The dominant landscape feature is the open plains of the Karoo scrub and the Nama Karoo. Historically, land uses within the project vicinity are agricultural, predominantly sheep farming.

“De Aar was established in 1903 and has a population of approximately 46 000 people. It was a main junction for the first railway line from Cape Town to Kimberley in 1881. De Aar has excellent transport infrastructure and is renowned for its central location on the main railway line and highway between Johannesburg, Cape Town, Port Elizabeth and Namibia. There are also two airfields used by civil aviation in De Aar. De Aar has the largest Central Business District (CBD) in the Emthanjeni Municipality due to the rich history of the railroad network that was once the economic drive of the area. (Emthanjeni, Emthanjeni Municipality Spatial Development Framework (SDF), 2007) De Aar is also a primary commercial distribution centre for a large area of the central Great Karoo. Major

production activities of the area include wool production and livestock farming." *(http://www.deaar.co.za).*

6.1 Renewable Energy Projects

De Aar has some of the highest renewable energy resource levels in the world, with good existing road infrastructure and accessibility to the national grid. There are 10 proposed renewable energy projects in the area surrounding De Aar. Of these 4 projects are situated to the south east of De Aar and 1 large area to the north east are pending. 3 projects have been approved and 1 has a preferred bidder status. (See Figure 5 below)

Already under construction is the 50MW De Aar Solar PV Project (Siemens/Globeleq/ Mainstream consortium) which is located 6 km outside the town of De Aar on land owned by the Emthanjeni Municipality in the Northern Cape. The project will cover an estimated 100 hectares and use 167 580 PV panels that will be fed directly into the Eskom 132 KV distribution system. *(http://www.futuregrowth.co.za).* The proposed Solar Capital De Aar Solar Farm is located on a 2 300 hectare farm outside De Aar, which will have 1 000 000 solar panels erected in the initial phase.

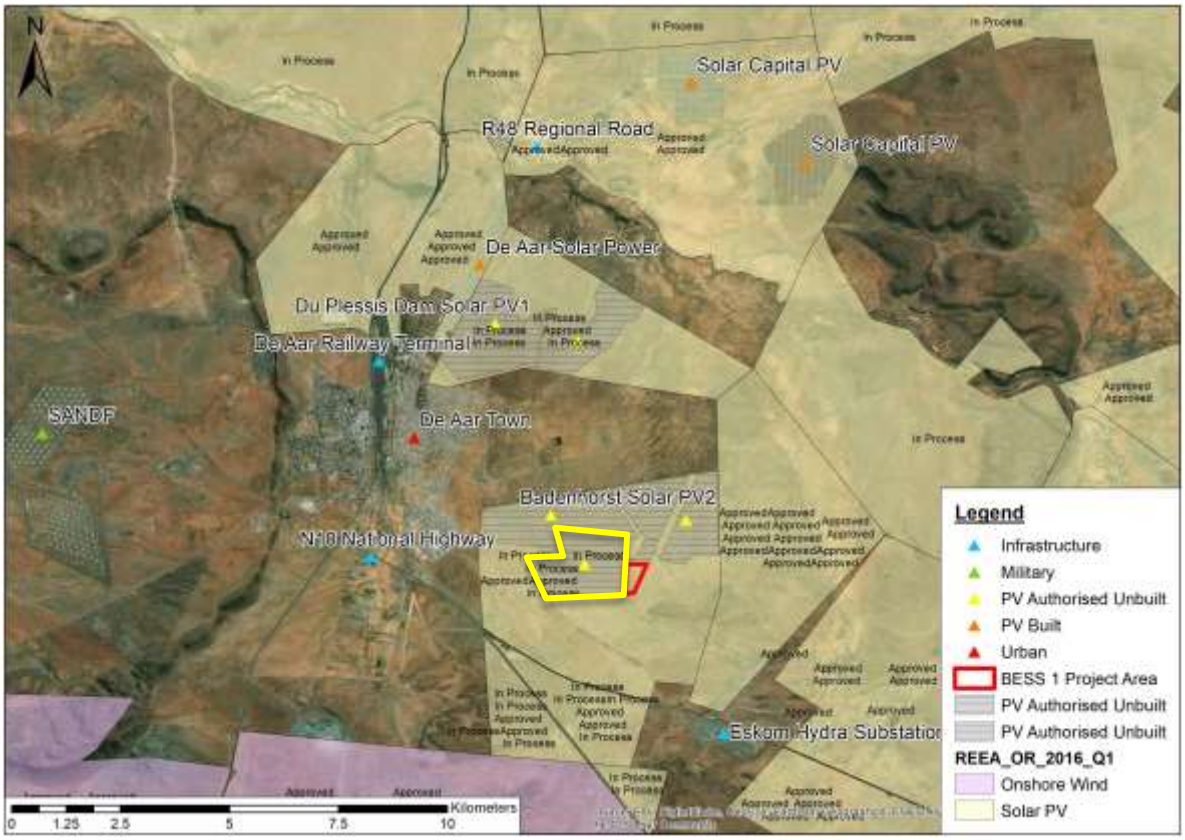

Figure 5. Landscape Context Map with the approximate location of the project outlined in yellow.

Currently, and increasingly in the future, the primary sense of the place is one strongly defined by renewable energy landscape modifications. A key cumulative effect is intervisibility of multiple PV projects, creating a massing effect. The factor influencing intervisibility is distance and terrain. The proposed PV site is well set back from the town, as well as other proposed PV areas to the north and west. The terrain is flat with no

prominent features within the development footprint. As a result of the flat terrain, and the distance between the other proposed PV project, the collective Bardenhorst PV complex is unlikely to result in dominating intervisibility effects. KH concludes that while intervisibility will take place, the resultant cumulative effect is likely to be Medium, stating “in a very populated area, with complex landscape patterns, the number of proposed developments could result in a high visual impact. In this context, the long views, exposed sites, roads with little traffic, small to medium sized towns, all combine to rate this cumulative impact as medium” (KH). The site visit confirmed these findings, with the flat terrain and the low prominence of the site, as well as the lower visual exposure to urban receptors, helping to reduce the intensity of the visual intrusion, and thus the intervisibility as well.

6.2 Vegetation

According to the 2013 Aurecon Group South Africa EIA study for the PV projects, the study area falls within the Nama-Karoo Biome and there is one vegetation type occurring within the study site, namely Northern Upper Karoo. This vegetation type occurs in the northern parts of the Upper Karoo Plateau, with its southern extent ending near De Aar. It is a shrubland dominated by dwarf karoo shrubs, grasses and some low trees. It is considered to be a Least Threatened vegetation type. Vegetation variety is limited to one or two vegetation types but is fairly iconic as a representation of the Nama Karoo landscape, which is strongly associated with South African landscape heritage.

6.3 Protected Areas

A Google Earth spatial search and viewshed analysis found no protected areas falling within the project Zone of Visual Influence.

6.4 Topography

The topography is a crucial factor in determining the landscape as the fall of the land often defines mountain and river features. To better understand the topography, a regional Digital Elevation Model (DEM) was generated using NASA ASTER 90m DEM data. (NASA, 2009)

The data is generalised, and although will not reflect smaller topographic features, it is useful in understanding the broader topographical landscape character. A regional Digital Elevation Map is also useful to determine general drainage of the site. To assist in the understanding of the elevation map, a graphical representation of the terrain was also implemented with lines running through the study area.

The Northern Cape is characterised by wide open plains, sparse settlements and open spaces. The topography of the area is relatively flat, although there are a few ridge-shaped hills and larger flatter plateaus. According to the 2013 Aurecon study for the PV projects, the study area falls within the arid region of South Africa and within the Lower Orange Water Management Area. The Lower Orange Water Management Area has very little useable surface runoff due to the low rainfall in the area. Two perennial rivers are located near De Aar, with the Elandsfontein River running west of De Aar and the Brak

River passing De Aar to the north. Badenhorst Dam falls within the catchment of the Brak River.

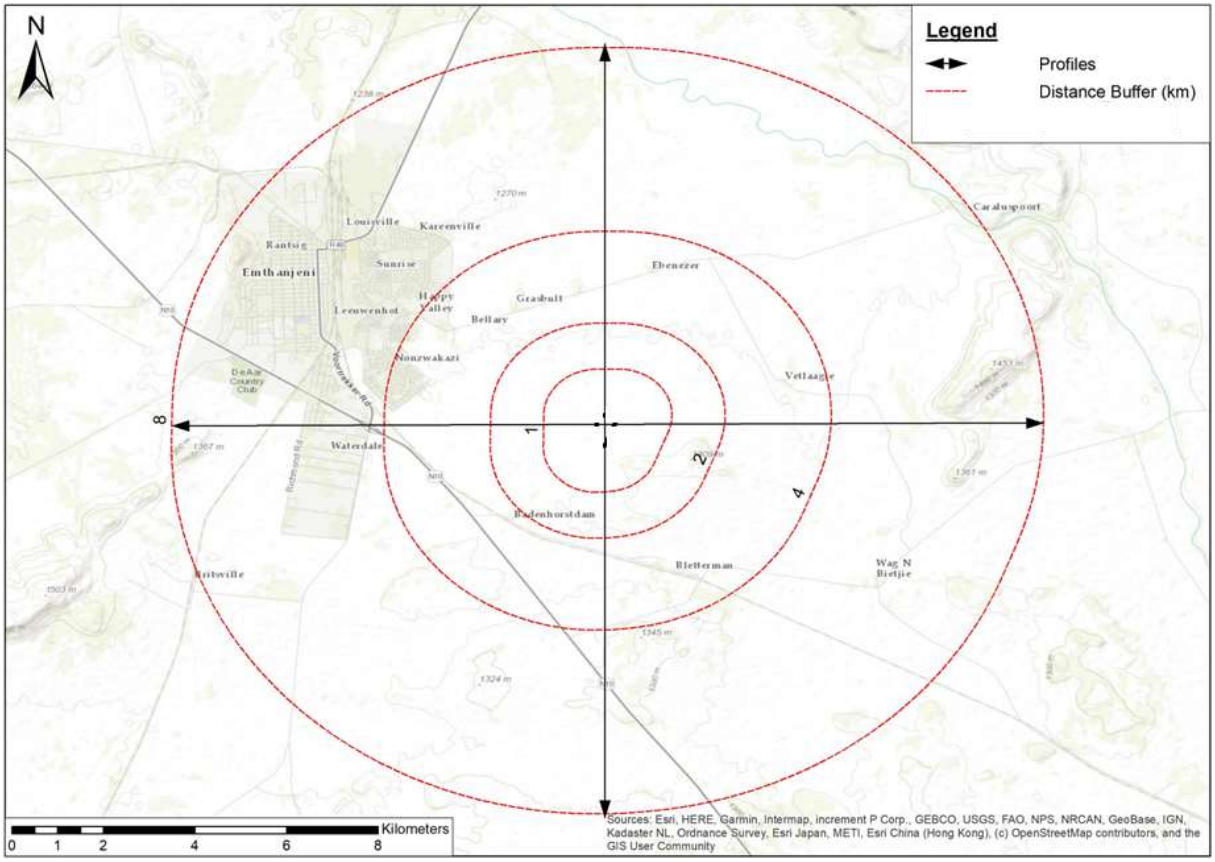

Figure 6. Digital elevation model overlay onto Site Locality Map.

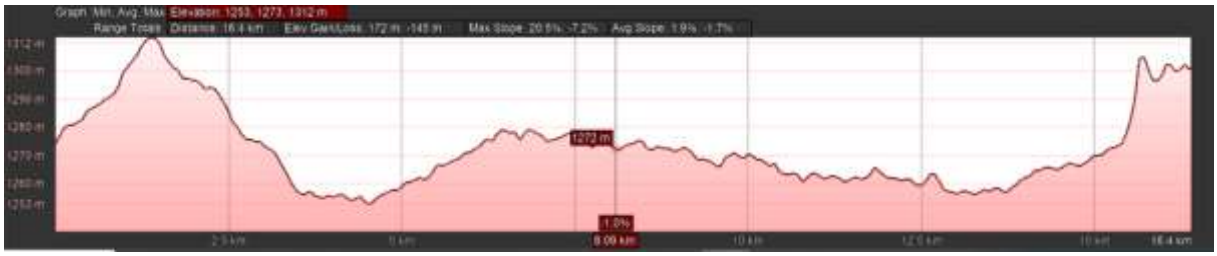
Figure 7: Proposed East West Profile (Google Earth, 2020)

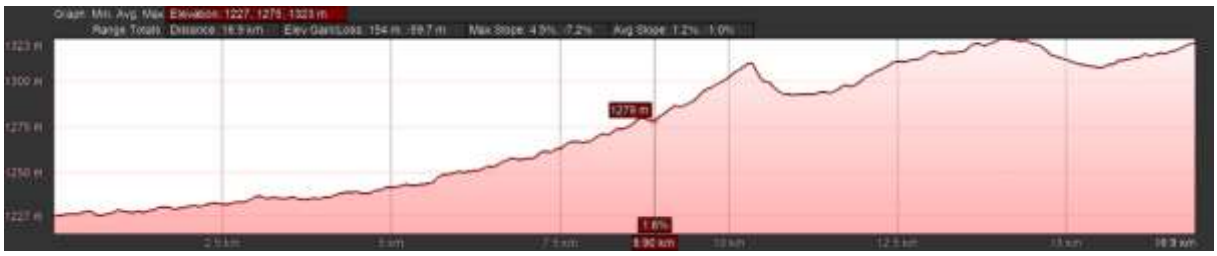
Figure 8: Proposed North South Profile (Google Earth, 2020)

The site is located in a wide valley that is predominantly flat but with some isolated low hills and ridgelines. There is a small ridgeline to the west and east; both located approximately 7km away. The north south profile shows the site has a gentle gradient to the north. The site visit found that there were no steep slope areas on site. The East to West Profile reflects the property having an easterly facing aspect, draining to lower lying ground to the

east. The Higher ground to the west would reduce the expected visibility to within the local landscape context. The North-South Profile reflects a northern aspect with the gradient draining to the north. A small ridgeline to the south restricts the visibility in this direction, but with more open views to the north. A slopes analysis for the site found that no steep slopes were found on the proposed development area, and that the development area is predominantly flat, in a wide valley that has low gradient.

6.5 Project Zone of Visual Influence

The visible extent, or viewshed, is "the outer boundary defining a view catchment area, usually along crests and ridgeline processes" (Oberholzer, 2005). The viewshed analysis is undertaken to determine the extent to which the proposed landscape change would be visible to the surrounding areas. This mapping exercise is used to determine the people located within the project zone of visual influence, as well as define the significant visual resources that could be influenced by the proposed landscape modification.

A viewshed analysis was undertaken from the proposed site at a specified height above ground level to define the extent of the possible visual influence of the proposed landscape modification (Refer to Table below). A Digital Elevation Model was created making use of open source NASA ASTER Digital Elevation Model. (NASA, 2009). The extent of the viewshed analysis is restricted to a defined distance of 8km as the project ZVI is unlikely to extend beyond this distance due to atmospheric influences. The maps are informative only as visibility tends to diminish exponentially with distance, which is well recognised in visual analysis literature (Hull & Bishop, 1988).

Table 6: Proposed Project Heights Table

Proposed Activity	**Approx. Maximum Height above ground level (m)**	**Viewshed Extent (km)**
PV	4m	8 km

It is important to note that the terrain model ***excludes vegetation and structural screening*** which could influence the extent of the visibility. The receptor height value was set at 1.5m above ground to represent best international practice for receptor height. The maximum height of the proposed PV structure is 4 m in height and the extent of the viewshed was capped at 8 kilometres as the Zone of Visual Influence is unlikely to extent beyond this distance.

The map above reflects the extent of the viewshed, divided up into categories that indicate the visual exposure to the property. Due to the flat terrain surrounding the site, the 2km - High Exposure area affords clear visibility from all portions of land surrounding the site. This area is most likely to experience some change to the landscape character, where clear views of the landscape change will take place at a size and scale that may dominate the attention of the casual observer. The land use in this area is farming and has no receptors. The Medium Exposure (4km) area also extends around the site due to the flat terrain, but with the higher ground to the southeast starting to reduce visibility. This area included the urban areas of De Aar with the areas of Happy Valley and Nonzwakazi informal settlement included in the viewshed area, as well as the N10 National Highway. The 6km area in the map depicts the viewshed with Low Exposure. This area is shaped to

the north due to higher terrain restricting views to the south. Receptors within this area would include residents of De Aar central town, but due to the built nature of the area, visibility is highly unlikely to take place.

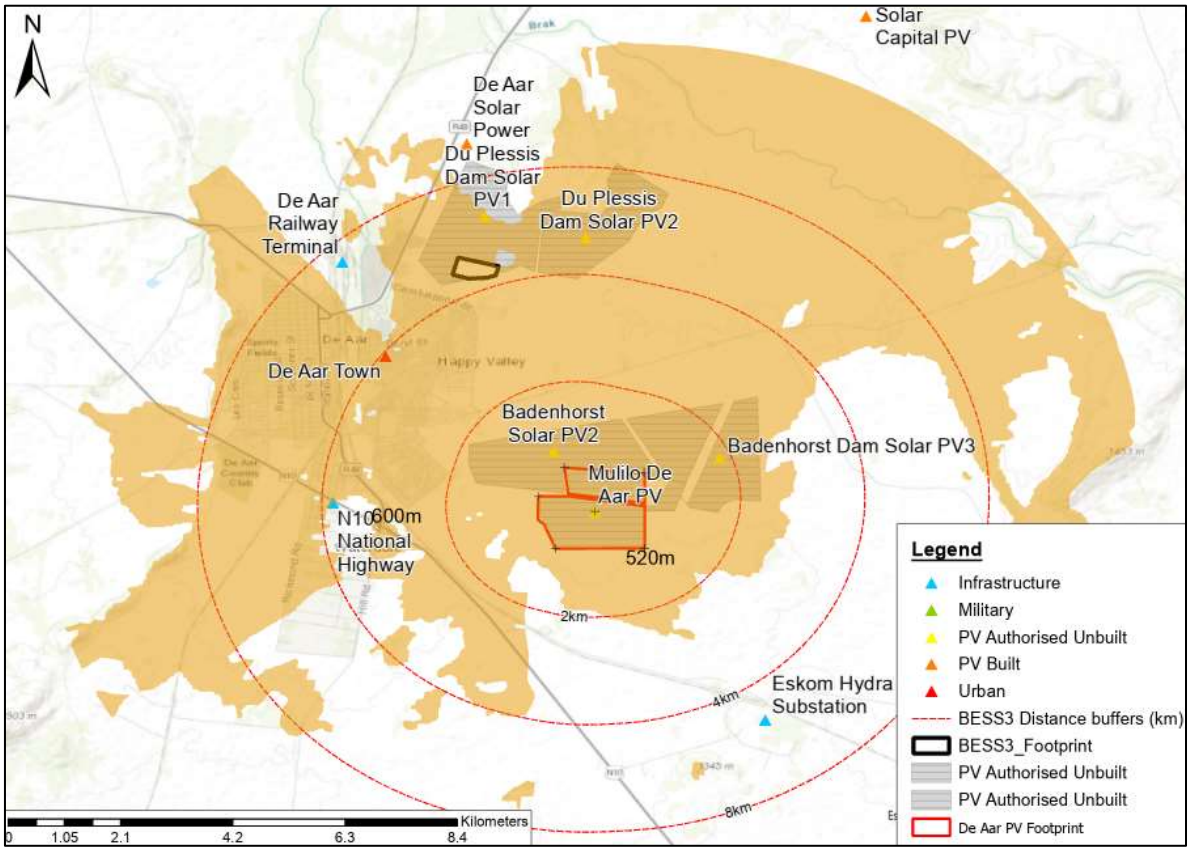

Figure 9. Project approximate viewshed map.

The Zone of Visual Influence is defined as Medium, as limited expansion of the visibility will take place due to the flat terrain in the wide valley topographic context. The visual absorption capacity (VAC) is currently low due to the lack of development of the property and the agricultural land uses. However, the surrounding landscape context also include multiple power lines, as well as the build nature of the southern eastern De Aar suburban areas, and as such the VAC is rated as Medium to High.

6.6 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 for further evaluation in the impact assessment phase. The receptors located within the ZVI and KOPs view lines are mapped and described below.

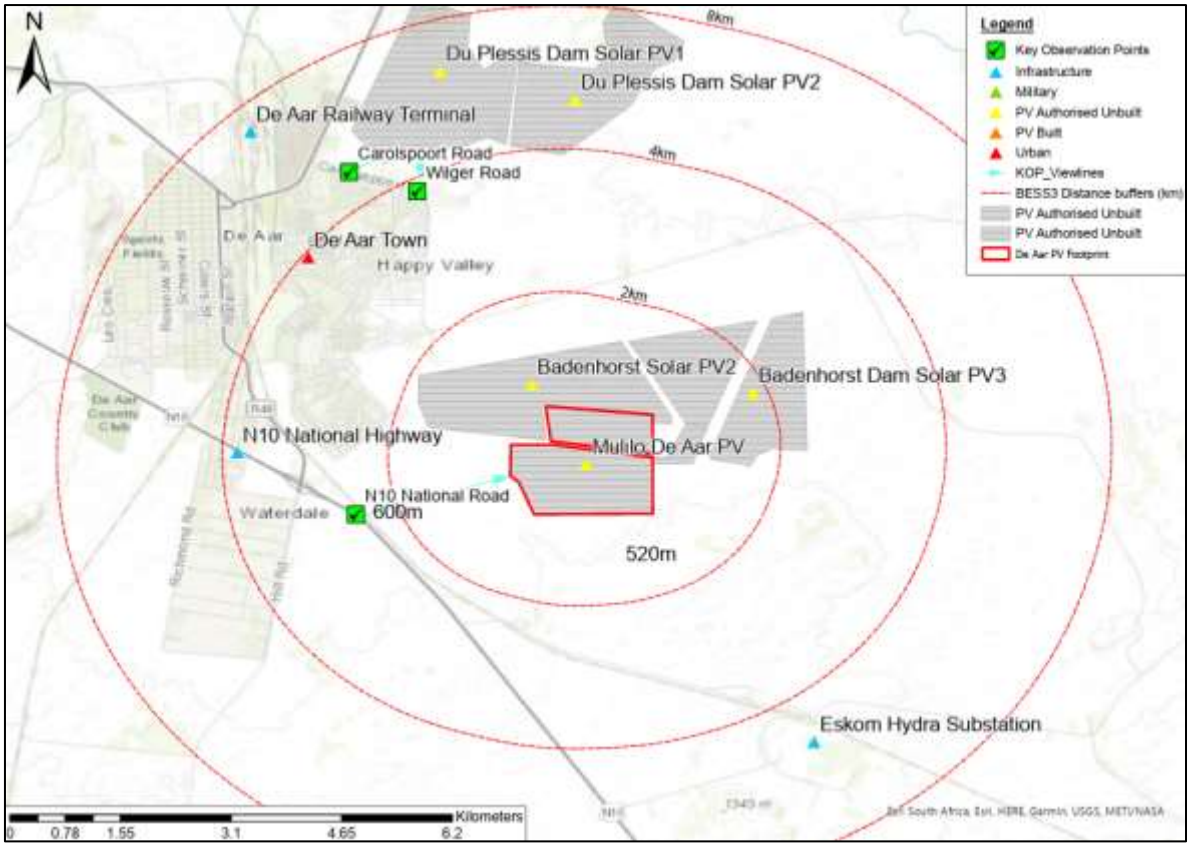

Figure 10. Receptor Key Observation Point locality map for the N10 National Road.

Table 7: Receptor and KOP Motivation Table.

Name	Km	Zone	Exposure	KOP	Motivation
N10	2km	Middle ground	Medium	Yes	Receptors making use of the N10 are approximately 3.5 km from the site and will have Medium exposure to the landscape modifications, potentially influencing the local sense of place.
Nonzwakazi informal settlement	1.5km	Middle ground	Medium	No	The project is located approximately 1.5km from the Nonzwakazi informal settlement at a similar elevation. The built nature of the local urban sense of place is likely to limit receptor sensitivity to landscape change.

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 project 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 is not rated for scenic quality and receptor sensitivity to landscape change. Due to the uniformity of the urban landscape, only a single Physiographic Rating Unit was defined as describe below.

Table 8: Physiographic Landscape Rating Units Table

Landscapes	**Motivation**
Rural agricultural Grasslands	Only a single landscape type was identified on site, that of ***rural agricultural grasslands***.

Table 9: Site Scenic Quality and Receptor Sensitivity Rating Table.

Project Site	**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**							
	Type	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
Site 1	Not Applicable	(Class I is not rated)																
Site 1	Rural Agricultural Grasslands	1	1	0	1	2	3	2	10	C	L	L	L	M	L	L	IV	IV

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.

7.2 Scenic Quality Assessment

The dominant landscape was rated for Scenic Quality and was rated Medium-Low as a visual resource.

Table 10: Scenic Quality Rating Table

Landscapes	Rating	Motivation
Landform	1	Landform is flat with no significant landforms.
Vegetation	1	The vegetation is uniform, veld grasslands.
Water	1	No water features were identified on the site.
Colour	1	The colours are mainly related to the vegetation and are browns and greens due to season variations.
Scarcity	2	The rural agricultural grassland landscapes are interesting in context but are widespread in the region.
Adjacent Landscapes	3	The adjacent landscape area is also veld grasslands with a similar sense of place. The adjacent pylons degrade the local sense of place and as such are rated Low.
Cultural Modifications	2	There are no cultural landscape modifications that detract from the site sense of place and rated as Low to Medium positive.
Scenic Quality	Medium Low	The overall Scenic Quality is rated Medium to Low. The grasslands do add to the rural agricultural sense of place, but the adjacent power line corridor detracts from the local sense of place.

7.3 Receptor Sensitivity Assessment

The dominant landscape was rated for receptor sensitivity to landscape change. The expected receptor sensitivity to landscape change is rated as ***Low***.

Table 11: Receptor Sensitivity Rating Table

Landscapes	Rating	Motivation
Type of Users	Low	The site is fairly remote and has no high exposure receptors.
Amount of use	Low	The area is not used much as the site is located on a property zoned rural agricultural, and falls within the mid ground, background views for the urban receptors located 3km to the west.
Public interest	Low	Public Interest is rated Low as the dominant sense of place is strongly (or will be) defined by renewable energy development.
Adjacent land Users	Moderate	Adjacent land users are also rural and are not related to tourist activities and have no landscape significance
Special Areas	Low	The area is not zoned as a special area
Receptor Sensitivity	Low	The site is remote with no close proximity receptors. The urban nature of the De Aar receptors located 3km to the west is likely to reduce their sensitivity to landscape change.

7.4 Visual Resources Management Classes

The BLM methodology defines 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

The Classes are not prescriptive and are utilised as a guideline to determine the carrying capacity of a visually preferred landscape that is utilised to assess the suitability of the landscape change associated with the proposed project. The Visual Inventory Classes are defined using the matrix below and with motivation, can be adjusted to Visual Resource Management Classes which take zoning and regional planning into consideration if applicable. The VRM ratings summary is provided in Annexure B.

7.4.1 VRM Class Motivation

Class I

The Class I 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. Class I is assigned when a decision is made to maintain a natural landscape.

The following physiographic landscapes were assigned a Class I Visual Objective.

No Class I areas were identified on the site

No significant visual resources were identified on or surrounding the site which would require landscape protection. No significant botanical or hydrological significant was defined for the site.

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.

The following physiographic landscapes were assigned a Class II Visual Objective.

No Class II areas were identified on the site.

Due to the rural agricultural nature of the site and immediate surrounds with no receptors and high Visual Absorption Capacity of the significant changes being made to the surrounding landscape context,

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 physiographic landscapes were assigned a Class III Visual Objective.

Not applicable

No Class III areas were identified on the site.

VRM Class IV

The following physiographic landscapes were assigned a Class IV Visual Objective.

Rural Agricultural Grassland

The Scenic Quality of the area is Medium to Low as the adjacent power line corridor detracts from the local rural agricultural sense of place. Receptor Sensitivity is rated Low as the site is remote with no close proximity receptors. The urban nature of the De Aar receptors located 3km to the west is likely to reduce their sensitivity to landscape change. Using the defined VRM Matrix, the Visual Inventory is rated Class IV. As there is no conflict with planning policy, the Visual Inventory rating is accepted as the Visual Resource Managed rating.

The Class IV objective is to provide for management activities that require no modifications of the existing character of the landscape but working within international best practice for landscape modification management and restoration. However, added value needs to be incorporated into the landscape, especially gives the current rural agricultural landscape context of the surrounding areas. Thus, ***best practice in visual design should be incorporated into the landscape change to ensure that the new landscape change does not detract from the (currently) surrounding rural agricultural landscape context.***

8 CONCLUSION

The finding from the Karen Hansen VIA is that The study concluded that:

- "the overall visual impact of the proposed developments would be moderate, due to the scale of the development, the numbers and types of receptors directly affected, and the shielding by built form. It was noted that the semi-industrial nature of a PVF was not incompatible with the industrial uses locally and the transmission lines. A number of mitigation measures was proposed which could moderate that visual impact" (KH).
- "The solar arrays will be close to De Aar, but the scale of the landscape is sufficient to provide a setting for these developments as they are widely spaced, and the area is already partly industrialised" (KH).

The findings of this visual statement, based on the review of the KH VIA report, as well as a site visit to undertake a basic visual assessment of the Badenhorst Dam PV BESS located adjacent to this site, is that the KH findings are still valid, and that Visual Impacts are likely to be Moderate. An independent review of the KH report found that the proposed development site is Class IV, suitable for PV development that could result in some visual intrusion,

without significantly degrading the medium to low visual resources of the local landscape. **The environment has not changed significantly since 2012; therefore, there is no objection to the extension of the validity of the Environmental Authorisation**

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10 ANNEXURE A: SPECIALIST INFORMATION

10.1 Professional Registration Certificate

APHP

Association of Professional Heritage Practitioners

MEMBERSHIP CERTIFICATE

THIS CERTIFIES THAT

Stephen Stead

MEMBERSHIP NUMBER: 0063

has been awarded membership as a

PROFESSIONAL HERITAGE PRACTITIONER (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 PHP 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 2022 – 1 JULY 2023

CHAIRPERSON

[Issued by the Association of Professional Heritage Practitioners Executive Committee]
Image Source: Photographer G McLachlan at central Kouga Mountains

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

10.2 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 12: VRM Africa Projects Assessments Table

YEAR	NAME	DESCRIPTION	LOCATION
2022	Sea Vista St Francis Bay	Resort	Eastern Cape (SA)
2022	Elandfontein PV Grid Connect	Powerline	North West (SA)
2022	Houthaalboomen PV Grid Connect	Powerline	North West (SA)
2022	Houthaalboomen PV x 3	Solar Energy	North West (SA)
2022	Pofadder Wind x 3	Wind Energy	Northern Cape (SA)
2022	Lunsklip Wind Amend	Wind Energy	Western Cape (SA)
2022	Lunsklip Wind Grid Connect	Power line	Western Cape (SA)
2022	Elandsfontein PV	Solar Energy	North West (SA)
2022	Erf 1713 1717 UISP	Settlement	Western Cape (SA)
2022	Roan PV x 2	Solar Energy	North West (SA)
2021	Avondale Gordonia 132kV Power Line	Infrastructure	Northern Cape (SA)
2021	Maitland Mines Wedding Venue	Resort	Eastern Cape (SA)
2020	Humansdorp BESS	Battery Storage	Northern Cape (SA)
2020	Bloemsmond PV BESS x 5	Battery Storage	Northern Cape (SA)

2020	Mulilo Prieska BESS x 5	Battery Storage	Northern Cape (SA)
2020	Mulilo De Arr BESS x 3	Battery Storage	Northern Cape (SA)
2020	Sandpiper Estate	Residential	Western Cape (SA)
2020	Obetsebi Lampley Interchange	Infrastructure	Ghana
2019	Wolvedans Megadump Facility	Mining	Mpumalanga (SA)
2019	Port Barry Residential	Settlement	Western Cape (SA)
2019	Gamsberg Smelter	Plant	Northern Cape (SA)
2019	Sandpiper Nature Reserve Lodge	Residential	Western Cape (SA)
2019	Bloemsmond PV 4 - 5	Solar Energy	Northern Cape (SA)
2019	Mphepo Wind (Scoping Phase)	Wind Energy	Zambia
2018	Mogara PV	Solar Energy	Northern Cape (SA)
2018	Gaetsewe PV	Solar Energy	Northern Cape (SA)
2017	Kalungwishi Hydroelectric (2) and power line	Hydroelectric	Zambia
2017	Mossel Bay UISP (Kwanoqaba)	Settlement	Western Cape (SA)
2017	Pavua Dam and HEP	Hydroelectric	Mozambique (SA)
2017	Penhill UISP Settlement (Cape Town)	Settlement	Western Cape (SA)
2016	Kokerboom WEF * 3	Wind Energy	Northern Cape (SA)
2016	Hotazel PV	Solar Energy	Northern Cape (SA)
2016	Eskom Sekgame Bulkop Power Line	Infrastructrue	Northern Cape (SA)
2016	Ngonye Hydroelectric	Hydroelectric	Zambia
2016	Levensdal Infill	Settlement	Western Cape (SA)
2016	Arandis CSP	Solar Energy	Namibia
2016	Bonnievale PV	Solar Energy	Western Cape (SA)
2015	Noblesfontein 2 & 3 WEF (Scoping)	Wind Energy	Eastern Cape (SA)
2015	Ephraim Sun SEF	Solar Energy	Nothern Cape (SA)
2015	Dyasonsklip and Sirius Grid TX	Solar Energy	Nothern Cape (SA)
2015	Dyasonsklip PV	Solar Energy	Nothern Cape (SA)
2015	Zeerust PV and transmission line	Solar Energy	North West (SA)
2015	Bloemsmond SEF	Solar Energy	Nothern Cape (SA)
2015	Juwi Copperton PV	Solar Energy	Nothern Cape (SA)
2015	Humansrus Capital 14 PV	Solar Energy	Nothern Cape (SA)
2015	Humansrus Capital 13 PV	Solar Energy	Nothern Cape (SA)
2015	Spitzkop East WEF (Scoping)	Solar Energy	Western Cape (SA)
2015	Lofdal Rare Earth Mine and Infrastructure	Mining	Namibia
2015	AEP Kathu PV	Solar Energy	Nothern Cape (SA)
2014	AEP Mogobe SEF	Solar Energy	Nothern Cape (SA)
2014	Bonnievale SEF	Solar Energy	Western Cape (SA)
2014	AEP Legoko SEF	Solar Energy	Northern Cape (SA)
2014	Postmasburg PV	Solar Energy	Northern Cape (SA)
2014	Joram Solar	Solar Energy	Northern Cape (SA)
2014	RERE PV Postmasberg	Solar Energy	Northern Cape (SA)

2014	RERE CPV Upington	Solar Energy	Northern Cape (SA)
2014	Rio Tinto RUL Desalinisation Plant	Industrial	Namibia
2014	NamPower PV * 3	Solar Energy	Namibia
2014	Pemba Oil and Gas Port Expansion	Industrial	Mozambique
2014	Brightsource CSP Upington	Solar Energy	Northern Cape (SA)
2014	Witsand WEF (Scoping)	Wind Energy	Western Cape (SA)
2014	Kangnas WEF	Wind Energy	Western Cape (SA)
2013	Cape Winelands DM Regional Landfill	Industrial	Western Cape (SA)
2013	Drennan PV Solar Park	Solar Energy	Eastern Cape (SA)
2013	Eastern Cape Mari-culture	Mari-culture	Eastern Cape (SA)
2013	Eskom Pantom Pass Substation	Substation /Tx lines	Western Cape (SA)
2013	Frankfort Paper Mill	Plant	Free State (SA)
2013	Gibson Bay Wind Farm Transmission lines	Tranmission lines	Eastern Cape (SA)
2013	Houhoek Eskom Substation	Substation /Tx lines	Western Cape (SA)
2013	Mulilo PV Solar Energy Sites (x4)	Solar Energy	Northern Cape (SA)
2013	Namies Wind Farm	Wind Energy	Northern Cape (SA)
2013	Rossing Z20 Pit and WRD	Mining	Namibia
2013	SAPPI Boiler Upgrade	Plant	Mpumalanga (SA)
2013	Tumela WRD	Mine	North West (SA)
2013	Weskusfleur Substation (Koeburg)	Substation /Tx lines	Western Cape (SA)
2013	Yzermyn coal mine	Mining	Mpumalanga (SA)
2012	Afrisam	Mining	Western Cape (SA)
2012	Bitterfontein	Solar Energy	Northern Cape (SA)
2012	Kangnas PV	Solar Energy	Northern Cape (SA)
2012	Kangnas Wind	Solar Energy	Northern Cape (SA)
2012	Kathu CSP Tower	Solar Energy	Northern Cape (SA)
2012	Kobong Hydro	Hydro & Powerline	Lesotho
2012	Letseng Diamond Mine Upgrade	Mining	Lesotho
2012	Lunsklip Windfarm	Wind Energy	Western Cape (SA)
2012	Mozambique Gas Engine Power Plant	Plant	Mozambique
2012	Ncondezi Thermal Power Station	Substation /Tx lines	Mozambique
2012	Sasol CSP Tower	Solar Power	Free State (SA)
2012	Sasol Upington CSP Tower	Solar Power	Northern Cape (SA)
2011	Beaufort West PV Solar Power Station	Solar Energy	Western Cape (SA)
2011	Beaufort West Wind Farm	Wind Energy	Western Cape (SA)
2011	De Bakke Cell Phone Mast	Structure	Western Cape (SA)
2011	ERF 7288 PV	Solar Energy	Western Cape (SA)
2011	Gecko Industrial park	Industrial	Namibia
2011	Green View Estates	Residential	Western Cape (SA)
2011	Hoodia Solar	Solar Energy	Western Cape (SA)
2011	Kalahari Solar Power Project	Solar Energy	Northern Cape (SA)

2011	Khanyisa Power Station	Power Station	Western Cape (SA)
2011	Olvyn Kolk PV	Solar Energy	Northern Cape (SA)
2011	Otjikoto Gold Mine	Mining	Namibia
2011	PPC Rheebieck West Upgrade	Industrial	Western Cape (SA)
2011	George Southern Arterial	Road	Western Cape (SA)
2010	Bannerman Etango Uranium Mine	Mining	Namibia
2010	Bantamsklip Transmission	Transmission	Eastern Cape (SA)
2010	Beaufort West Urban Edge	Mapping	Western Cape (SA)
2010	Bon Accord Nickel Mine	Mining	Mapumalanga (SA)
2010	Etosha National Park Infrastructure	Housing	Namibia
2010	Herolds Bay N2 Development Baseline	Residential	Western Cape (SA)
2010	MET Housing Etosha	Residential	Namibia
2010	MET Housing Etosha Amended MCDM	Residential	Namibia
2010	MTN Lattice Hub Tower	Structure	Western Cape (SA)
2010	N2 Herolds Bay Residental	Residential	Western Cape (SA)
2010	Onifin(Pty) Ltd Hartenbos Quarry Extension	Mining	Western Cape (SA)
2010	Still Bay East	GIS Mapping	Western Cape (SA)
2010	Vale Moatize Coal Mine and Railway	Mining / Rail	Mozambique
2010	Vodacom Mast	Structure	Western Cape (SA)
2010	Wadrif Dam	Dam	Western Cape (SA)
2009	Asazani Zinyoka UISP Housing	Residential Infill	Western Cape (SA)
2009	Eden Telecommunication Tower	Structure	Western Cape (SA)
2009	George SDF Landscape Characterisation	GIS Mapping	Western Cape (SA)
2009	George SDF Visual Resource Management	GIS Mapping	Western Cape (SA)
2009	George Western Bypass	Road	Western Cape (SA)
2009	Knysna Affordable Housing Heidevallei	Residential Infill	Western Cape (SA)
2009	Knysna Affordable Housing Hornlee Project	Residential Infill	Western Cape (SA)
2009	Rossing Uranium Mine Phase 2	Mining	Namibia
2009	Sun Ray Wind Farm	Wind Energy	Western Cape (SA)
2008	Bantamsklip Transmission Lines Scoping	Transmission	Western Cape (SA)
2008	Erf 251 Damage Assessment	Residential	Western Cape (SA)
2008	Erongo Uranium Rush SEA	GIS Mapping	Namibia
2008	Evander South Gold Mine Preliminary VIA	Mining	Mpumalanga (SA)
2008	George SDF Open Spaces System	GIS Mapping	Western Cape (SA)
2008	Hartenbos River Park	Residential	Western Cape (SA)
2008	Kaaimans Project	Residential	Western Cape (SA)
2008	Lagoon Garden Estate	Residential	Western Cape (SA)
2008	Moquini Beach Hotel	Resort	Western Cape (SA)
2008	NamPower Coal fired Power Station	Power Station	Namibia
2008	Oasis Development	Residential	Western Cape (SA)
2008	RUL Sulpher Handling Facility Walvis Bay	Mining	Namibia

2008	Stonehouse Development	Residential	Western Cape (SA)
2008	Walvis Bay Power Station	Structure	Namibia
2007	Calitzdorp Retirement Village	Residential	Western Cape (SA)
2007	Calitzdorp Visualisation	Visualisation	Western Cape (SA)
2007	Camdeboo Estate	Residential	Western Cape (SA)
2007	Destiny Africa	Residential	Western Cape (SA)
2007	Droogfontein Farm 245	Residential	Western Cape (SA)
2007	Floating Liquified Natural Gas Facility	Structure tanker	Western Cape (SA)
2007	George SDF Municipality Densification	GIS Mapping	Western Cape (SA)
2007	Kloofsig Development	Residential	Western Cape (SA)
2007	OCGT Power Plant Extension	Structure Power Plant	Western Cape (SA)
2007	Oudtshoorn Municipality SDF	GIS Mapping	Western Cape (SA)
2007	Oudtshoorn Shopping Complex	Structure	Western Cape (SA)
2007	Pezula Infill (Noetzie)	Residential	Western Cape (SA)
2007	Pierpoint Nature Reserve	Residential	Western Cape (SA)
2007	Pinnacle Point Golf Estate	Golf/Residential	Western Cape (SA)
2007	Rheebok Development Erf 252 Apeal	Residential	Western Cape (SA)
2007	Rossing Uranium Mine Phase 1	Mining	Namibia
2007	Ryst Kuil/Riet Kuil Uranium Mine	Mining	Western Cape (SA)
2007	Sedgefield Water Works	Structure	Western Cape (SA)
2007	Sulpher Handling Station Walvis Bay Port	Industrial	Namibia
2007	Trekkopje Uranium Mine	Mining	Namibia
2007	Weldon Kaya	Residential	Western Cape (SA)
2006	Farm Dwarsweg 260	Residential	Western Cape (SA)
2006	Fynboskruin Extention	Residential	Western Cape (SA)
2006	Hanglip Golf and Residential Estate	Residential	Western Cape (SA)
2006	Hansmoeskraal	Slopes Analysis	Western Cape (SA)
2006	Hartenbos Landgoed Phase 2	Residential	Western Cape (SA)
2006	Hersham Security Village	Residential	Western Cape (SA)
2006	Ladywood Farm 437	Residential	Western Cape (SA)
2006	Le Grand Golf and Residential Estate	Residential	Western Cape (SA)
2006	Paradise Coast	Residential	Western Cape (SA)
2006	Paradyskloof Residential Estate	Residential	Western Cape (SA)
2006	Riverhill Residential Estate	Residential	Western Cape (SA)
2006	Wolwe Eiland Access Route	Road	Western Cape (SA)
2005	Harmony Gold Mine	Mining	Mpumalanga (SA)
2005	Knysna River Reserve	Residential	Western Cape (SA)
2005	Lagoon Bay Lifestyle Estate	Residential	Western Cape (SA)
2005	Outeniquabosch Safari Park	Residential	Western Cape (SA)
2005	Proposed Hotel Farm Gansevallei	Resort	Western Cape (SA)
2005	Uitzicht Development	Residential	Western Cape (SA)

2005	West Dunes	Residential	Western Cape (SA)
2005	Wilderness Erf 2278	Residential	Western Cape (SA)
2005	Wolwe Eiland Eco & Nature Estate	Residential	Western Cape (SA)
2005	Zebra Clay Mine	Mining	Western Cape (SA)
2004	Gansevallei Hotel	Residential	Western Cape (SA)
2004	Lakes Eco and Golf Estate	Residential	Western Cape (SA)
2004	Trekkopje Desalination Plant	Structure Plant	Namibia (SA)
1995	Greater Durban Informal Housing Analysis	Photogrametry	KwaZulu-Natal (SA)

11 ANNEXURE B: METHODOLOGY SUMMARY

11.1 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.

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.

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.

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.

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.

11.2 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.

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.