OYA ENERGY (PTY) LTD

Proposed Construction of the Oya 132kV Power Line near Matjiesfontein, Western and Northern Cape Provinces

Visual Impact Assessment Report – Basic Assessment

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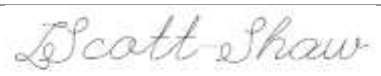
Signature:	
Client:	Oya Energy (Pty) Ltd

Confidentiality Statement

OYA ENERGY (PTY) LTD

PROPOSED CONSTRUCTION OF THE OYA 132KV POWER LINE NEAR MATJIESFONTEIN, WESTERN AND NORTHERN CAPE PROVINCES

VISUAL IMPACT ASSESSMENT REPORT – BASIC ASSESSMENT

Executive Summary

Oya Energy (Pty) Ltd, (hereafter referred to as “Oya Energy") is proposing to construct a 132 kilovolt (kV) overhead power line and substations near Matjiesfontein in the Western and Northern Cape Provinces (hereafter referred to as the “proposed development”). The overall objective of the proposed development is to feed the electricity generated by the proposed Oya Energy Facility (part of separate on-going EIA process under DEFF Ref No.: 14/12/16/3/3/2/2009) as well as potentially the other adjacent energy developments into the national grid. The grid connection and substations (this application) require a separate EA, in order to allow the EA to be handed over to Eskom.

The proposed overhead power line and substation project will be subject to a Basic Assessment (BA) process in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) (as amended) and Appendix 1 of the Environmental Impact Assessment (EIA) Regulations, 2014 promulgated in Government Gazette 40772 and GN R326, R327, R325 and R324 on 7 April 2017. This visual impact assessment (VIA) is being undertaken as part of the BA process.

The study area has a largely natural, untransformed visual character with some elements of rural / pastoral infrastructure and as such, the proposed power line and substation development would alter the visual character and contrast significantly with the typical land use and/or pattern and form of human elements present across the broader study area. The level of contrast is however reduced by the presence of the Perdekraal East WEF, associated power line infrastructure, Kappa substation and existing high voltage power lines located in the south-western sector of the study area.

A broad-scale assessment of landscape sensitivity, based on the physical characteristics of the study area, economic activities and land use that predominates, determined that the area would have a **low** visual sensitivity. An important factor contributing to the visual sensitivity of an area is the presence, or absence of visual receptors that would potentially be impacted by a proposed development.

The area is not typically valued for its tourism significance and no formal protected areas or recognised tourism routes were identified in the area. In addition, there is limited human habitation resulting in relatively few sensitive or potentially sensitive receptors across the entire extent of the study area (less than 0.3 receptors per square kilometre).

The Visual Impact Assessment (VIA) identified twenty-three (23) potentially sensitive receptors in the study area, i.e. within 5kms from the outer boundary of the combined power line assessment corridors and substation sites. Two (2) of these receptors are considered to be sensitive receptors as they are linked to leisure/nature-based tourism activities in the area. The remaining twenty-one (21) receptors are all farmsteads which are regarded as potentially sensitive visual receptors as they are located within a mostly natural setting and the proposed development will likely alter natural vistas experienced from these dwellings. Five of these potentially sensitive receptor locations were however found to be outside the viewshed of the proposed development and thus are not expected to experience any visual impacts as a result of the proposed development. These receptors were therefore removed from the assessment, leaving only sixteen 16 potentially sensitive receptors.

The VIA determined that the proposed development will have a high level of impact on one (1) of the sensitive receptors (Remainder of the Farm Baakens Rivier No 155). As this receptor is located on the proposed Oya Energy Facility (DEFF Ref No: 14/12/16/3/3/2/2009) development site, the owner of this farm portion has a vested interest in the proposed development and associated grid connection infrastructure and would therefore not perceive the proposed power line and substations in a negative light. The remaining sensitive receptor, which is located on the Remainder of the Farm Gats Rivier No 156, is only expected to experience moderate impacts from the proposed development. As this farm is part of an adjacent WEF (DEFF Ref No: 14/12/16/3/3/2/2009) the owner of this farm portion has a vested interest in the proposed development and associated grid connection infrastructure and would therefore not perceive the proposed power line and substations in a negative light.

Fifteen (15) potentially sensitive receptors will be subjected to moderate levels of visual impact as a result of the proposed power line development, while one (1) receptor will be subjected to low levels of visual impact. It was noted however, that thirteen of these receptors are located on farms which either form part of the power line development project or are located within the development sites for other renewable energy projects and as such the owners / occupants are not expected to perceive the proposed power line and substations in a negative light.

The overall impact rating revealed that the proposed development is expected to have a negative low visual impact rating during construction, operation and decommissioning phases with a number of mitigation measures available to prevent any additional visual impacts.

Several renewable energy developments are being proposed within a 35 km radius of the combined power line assessment corridors and substation sites. These renewable energy developments have the potential to cause large scale visual impacts and the location of several such developments in close proximity to each other could significantly alter the sense of place and visual character in the broader region. It was however determined that only five (5) of these would have any significant impact on the landscape within the study area. These facilities are Kudusberg WEF (14/12/16/3/3/1/1976/AM1) and Oya Energy Facility in the north-eastern sector of the study area and Perdekraal East WEF, Perdekraal West WEF and Tooverberg WEF in the south-west. The concentration of these facilities could potentially alter the inherent sense of place and introduce an increasingly industrial character into a largely rural area, thus

giving rise to significant cumulative impacts. In light of this, cumulative impacts have been rated as negative medium during both construction and operation phases of the project. It is however anticipated that these impacts could be mitigated to acceptable levels with the implementation of the recommendations and mitigation measures stipulated for each of these developments by the visual specialists. It is important to note, however, that the study area is located within the Renewable Energy Development Zone (REDZ) 2, namely the Komsberg REDZ[1], and also within a Strategic Transmission Corridor, and thus the relevant authorities support the concentration of renewable energy developments and associated grid connection infrastructure in this area. In addition, it is possible that the renewable energy facilities located in close proximity to each other could be seen as one large facility rather than separate developments. Although this will not necessarily reduce impacts on the visual character of the area, it could potentially reduce the cumulative impacts on the landscape.

A comparative assessment of alternatives was undertaken in order to determine which of the power line corridor alternatives would be preferred from a visual perspective. No fatal flaws were identified for any of the proposed power line corridor alternatives. Power Line Corridor Alternative 3 was identified as the Preferred Alternative, while Power Line Corridor Options 1, 2, 4 and 5 were found to be favourable.

From a visual perspective therefore, the proposed Oya 132kV power line and associated substation project is deemed acceptable and the Environmental Authorization (EA) should be granted. SiVEST is of the opinion that the visual impacts associated with the construction, operation and decommissioning phases can be mitigated to acceptable levels provided the recommended mitigation measures are implemented.

[1] formally gazetted (Gazette Number 41445) on 16 February 2018 by the Minister of Environmental Affairs (GN 114)

National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and Environmental Impact Assessment (EIA) Regulations, 2014 (as amended) - Requirements for Specialist Reports (Appendix 6)

Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6	**Section of Report**
(a) details of the specialist who prepared the report; and the expertise of that specialist to compile a specialist report including a *curriculum vitae*;	**Section 1.3.** Specialist CV's are included in **Appendix B**
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	**Appendix B**
(c) an indication of the scope of, and the purpose for which, the report was prepared;	**Section 1.1.** **Appendix A**
(cA) an indication of the quality and age of base data used for the specialist report;	**Section 1.4.** **Section 1.5.**
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	**Section 6.** . **Section 8.**
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	**Section 1.4** **Section 2.**
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	**Section 1.4.** **Appendix C**
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	**Section 6.**
(g) an identification of any areas to be avoided, including buffers;	**Section 6.3.** **Section 8.**
(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	**Section 6.3.**
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	**Section 2.**
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment or activities;	**Section 8.5** **Section 9**
(k) any mitigation measures for inclusion in the EMPr;	**Section 8.5.**
(l) any conditions for inclusion in the environmental authorisation;	No specific conditions relating to the visual environment need to be included in the

	environmental authorisation (EA)
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	**Section 8.5**
(n) a reasoned opinion— i. whether the proposed activity, activities or portions thereof should be authorised; iA. Regarding the acceptability of the proposed activity or activities; and ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr or Environmental Authorization, and where applicable, the closure plan;	**Section 10.1**
(o) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	**N/A** -No feedback has yet been received from the public participation process regarding the visual environment
(p) any other information requested by the competent authority	**N/A**. No information regarding the visual study has been requested from the competent authority to date.
(2) Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	**N/A**

OYA ENERGY (PTY) LTD

PROPOSED CONSTRUCTION OF THE OYA 132KV POWER LINE NEAR MATJIESFONTEIN, WESTERN AND NORTHERN CAPE PROVINCES

VISUAL IMPACT ASSESSMENT REPORT – BASIC ASSESSMENT

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GLOSSARY OF TERMS

ABBREVIATIONS

BA	Basic Assessment
DBAR	Draft Basic Assessment Report
DM	District Municipality
DoE	Department of Mineral Resources and Energy
DEM	Digital Elevation Model
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EMP	Environmental Management Plan
FBAR	Final Basic Assessment Report
GIS	Geographic Information System
HA	Hectares
HIA	Heritage Impact Assessment
I&AP	Interested and/or Affected Party
IPP	Independent Power Producer
LM	Local Municipality
kV	Kilovolt
MW	Megawatt
NEMA	National Environmental Management Act
NGI	National Geo-Spatial Information
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
O&M	Operation and Maintenance
PPA	Power Purchase Agreement
PV	Photovoltaic
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
SANBI	South African National Biodiversity Institute
SPEF	Solar Photovoltaic Energy Facility
VIA	Visual Impact Assessment
VR	Visual Receptor
WEF	Wind Energy Facility

DEFINITIONS

Anthropogenic feature: An unnatural feature resulting from human activity.

Cultural landscape: A representation of the combined worlds of nature and of man illustrative of the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal (World Heritage Committee, 1992).

Sense of place: The unique quality or character of a place, whether natural, rural or urban. It relates to uniqueness, distinctiveness or strong identity.

Scenic route: A linear movement route, usually in the form of a scenic drive, but which could also be a railway, hiking trail, horse-riding trail or 4x4 trail.

Sensitive visual receptors: An individual, group or community that is subject to the visual influence of the proposed development and is adversely impacted by it. They will typically include locations of human habitation and tourism activities.

Slope Aspect: Direction in which a hill or mountain slope faces.

Study area / Visual assessment zone; The study area or visual assessment zone is assumed to encompass a zone of 5km from the outer boundary of the proposed Solar PV Facility application site.

Viewpoint: A point in the landscape from where a particular project or feature can be viewed.

Viewshed / Visual Envelope: The geographical area which is visible from a particular location.

Visual character: The pattern of physical elements, landforms and land use characteristics that occur consistently in the landscape to form a distinctive visual quality or character.

Visual contrast: The degree to which the development would be congruent with the surrounding environment. It is based on whether or not the development would conform with the land use, settlement density, forms and patterns of elements that define the structure of the surrounding landscape.

Visual exposure: The relative visibility of a project or feature in the landscape.

Visual impact: The effect of an aspect of the proposed development on a specified component of the visual, aesthetic or scenic environment within a defined time and space.

Visual receptors: An individual, group or community that is subject to the visual influence of the proposed development but is not necessarily adversely impacted by it. They will typically

include commercial activities, residents and motorists travelling along routes that are not regarded as scenic.

Visual sensitivity: The inherent sensitivity of an area to potential visual impacts associated with a proposed development. It is based on the physical characteristics of the area (visual character), spatial distribution of potential receptors, and the likely value judgements of these receptors towards the new development, which are usually based on the perceived aesthetic appeal of the area.

OYA ENERGY (PTY) LTD

PROPOSED DEVELOPMENT OF THE 800MW OYA SOLAR PHOTOVOLTAIC (PV) FACILITY AND ASSOCIATED INFRASTRUCTURE NEAR MATJIESFONTEIN, WESTERN AND NORTHERN CAPE PROVINCES

VISUAL IMPACT ASSESSMENT REPORT – BASIC ASSESSMENT

1 INTRODUCTION

Oya Energy (Pty) Ltd, (hereafter referred to as “Oya Energy") is proposing to construct a 132 kilovolt (kV) overhead power line and substations near Matjiesfontein in the Western and Northern Cape Provinces (hereafter referred to as the “proposed development”). The overall objective of the proposed development is to feed the electricity generated by the proposed Oya Energy Facility (part of separate on-going EIA process under DEFF Ref No.: 14/12/16/3/3/2/2009) as well as potentially the other adjacent energy developments into the national grid. The grid connection and substations (this application) require a separate EA, in order to allow the EA to be handed over to Eskom.

The entire extent of the proposed 132kV overhead power line is located within one the Strategic Transmission Corridors as defined and in terms of the procedures laid out in Government Notice (GN) No. 113[2], namely the Central Corridor. The proposed overhead power line and substation project will therefore be subject to a basic Assessment (BA) process in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) (as amended) and Appendix 1 of the Environmental Impact Assessment (EIA) Regulations, 2014 promulgated in Government Gazette 40772 and GN R326, R327, R325 and R324 on 7 April 2017. The competent authority for this BA is the national Department of Environment, Forestry and Fisheries (DEFF). Specialist studies have been commissioned to assess and verify the OHL under the new Gazetted specialist protocols[3].

1.1 Scope and Objectives

This visual impact assessment (VIA) is being undertaken as part of the BA process. The aim of the VIA is to identify potential visual issues associated with the proposed 132kV power line and substations, as well as to determine the potential extent of visual impacts. This is done by characterising the visual environment of the area and identifying areas of potential visual

[2] Formally gazetted on 16 February 2018 (GN No. 113)
[3] Formally gazetted on 20 March 2020 (GN No. 320)

sensitivity that may be subject to visual impacts. This visual assessment focuses on the potential sensitive visual receptor locations and provides an assessment of the magnitude and significance of the visual impacts associated with the proposed development.

1.2 Terms of Reference

The terms of reference for this VIA are included in **Appendix A**.

1.3 Specialist Credentials

This VIA was undertaken by Kerry Schwartz, a GIS specialist with more than 20 years' experience in the application of GIS technology in various environmental, regional planning and infrastructural projects undertaken by SiVEST. Kerry's GIS skills have been extensively utilised in projects throughout South Africa and in other Southern African countries. Kerry has also been involved in the compilation of VIA reports. Kerry's relevant VIA project experience is listed in the table below.

Table 1: Relevant project experience

Environmental Practitioner	SiVEST (Pty) Ltd – Kerry Schwartz
Contact Details	kerrys@sivest.co.za
Qualifications	BA (Geography), University of Leeds 1982
Expertise to carry out the Visual Impact Assessment.	**Visual Impact Assessments:** ▪ VIAs (BA) for the proposed Gromis WEF and associated Grid Connection Infrastructure, near Komaggas, Northern Cape Province. ▪ VIAs (BA) for the proposed Komas WEF and associated Grid Connection Infrastructure, near Komaggas, Northern Cape Province. ▪ VIAs (Scoping and Impact Phase) for the proposed Mooi Plaats, Wonderheuvel and Paarde Valley solar PV plants near Noupoort in the Northern and Eastern Cape Provinces. ▪ VIAs (Scoping and Impact Phase) for the proposed Sendawo 1, 2 and 3 solar PV energy facilities near Vryburg, North West Province. ▪ VIAs (Scoping and Impact Phase) for the proposed Tlisitseng 1 and 2 solar PV energy facilities near Lichtenburg, North West Province. ▪ VIA for the proposed Nokukhanya 75MW Solar PV Power Plant near Dennilton, Limpopo Province. ▪ VIAs (Scoping and Impact Phase) for the proposed Helena 1, 2 and 3 75MW Solar PV Energy Facilities near Copperton, Northern Cape Province.

	▪ VIA (EIA) for the proposed Paulputs WEF near Pofadder in the Northern Cape Province. ▪ VIA (EIA) for the proposed development of the Rondekop WEF near Sutherland in the Northern Cape Province. ▪ VIA (BA) for the proposed development of the Tooverberg WEF near Touws Rivier in the Western Cape Province. ▪ VIA (BA) for the proposed development of the Kudusberg WEF near Sutherland, Northern and Western Cape Provinces. ▪ VIA (Scoping and Impact Phase) for the proposed development of the Kuruman Wind Energy Facility near Kuruman, Northern Cape Province. ▪ VIA (Scoping and Impact Phase) for the proposed development of the Phezukomoya Wind Energy Facility near Noupoort, Northern Cape Province. ▪ VIA (Scoping and Impact Phase) for the proposed development of the San Kraal Wind Energy Facility near Noupoort, Northern Cape Province. ▪ VIAs (Scoping and Impact Phase) for the proposed Graskoppies Wind Farm near Loeriesfontein, Northern Cape Province. ▪ VIAs (Scoping and Impact Phase) for the proposed Hartebeest Leegte Wind Farm near Loeriesfontein, Northern Cape Province. ▪ VIAs (Scoping and Impact Phase) for the proposed Ithemba Wind Farm near Loeriesfontein, Northern Cape Province. ▪ VIAs (Scoping and Impact Phase) for the proposed Xha! Boom Wind Farm near Loeriesfontein, Northern Cape Province ▪ Visual Impact Assessments for 5 Solar Power Plants in the Northern Cape ▪ Visual Impact Assessments for 2 Wind Farms in the Northern Cape ▪ Visual Impact Assessment for Mookodi Integration Project (132kV distribution lines) ▪ Landscape Character Assessment for Mogale City Environmental Management Framework
Divisional Manager / Quality Control	SiVEST SA (Pty) Ltd – Tarryn Curtis
Contact Details	tarrync@sivest.co.za
Qualifications	B.Sc. Geographical Science and B.Sc. (Hons) Environmental Management and Geography
Professional Affiliations	IAIAsa Membership Number: 3485
	Tarryn joined SiVEST in January 2011 in her capacity as Environmental Consultant. In May 2015, she was appointed as Divisional Manager for the Environmental Division, Pietermaritzburg Branch. In October 2018, Tarryn was appointed as Divisional Head for the Environmental

	Division nationwide. Tarryn has completed a Bachelor of Science Degree with a Geography Major (University of Natal, PMB), as well as a Bachelor of Science (Honours) in Environmental Management (University of Natal, PMB). Tarryn has been involved in consulting since 2007, which included scoping reports, environmental management plans, integrated management plans, basic assessment reports, environmental impact reports and auditing. Field of specialisation in Environmental Auditing, Environmental Project Management, Environmental Planning and Water Related Projects.

Full CVs are attached as **Appendix B**.

1.4 Assessment Methodology

This VIA has been based on a desktop-level assessment supported by field-based observation drawn from site visits undertaken in July 2018, August 2018 and July 2020.

1.4.1 Physical landscape characteristics

Physical landscape characteristics such as topography, vegetation and land use are important factors influencing the visual character and visual sensitivity of the study area. Baseline information about the physical characteristics of the study area was initially sourced from spatial databases provided by NGI, the South African National Biodiversity Institute (SANBI) and the South African National Land Cover Dataset (Geoterraimage – 2018). The characteristics identified via desktop analysis were later verified during the site visit.

1.4.2 Identification of sensitive receptors

Visual receptor locations and routes that are sensitive and/or potentially sensitive to the visual intrusion of the proposed development were assessed in order to determine the impact of the proposed development on each of the identified receptor locations. Information pertaining to visual receptors was largely drawn from recent visual assessments conducted in the general vicinity of the proposed development. These studies include VIAs for the proposed Kudusberg WEF (14/12/16/3/3/1/1976/AM1), Tooverberg WEF and grid connection infrastructure and Oya Energy Facility (14/12/16/3/3/2/2009).

1.4.3 Fieldwork and photographic review

Given that the proposed grid connection infrastructure is located within project areas already assessed for several renewable energy VIAs, it was not considered necessary to undertake any additional fieldwork. Fieldwork undertaken for VIAs for the Kudusberg WEF

(14/12/16/3/3/1/1976/AM1), Tooverberg WEF and grid connection infrastructure and Oya Energy Facility (14/12/16/3/3/2/2009) has therefore been used to inform this assessment. The fieldwork involved three (3) separate site visits conducted in July 2018, August 2018 and July 2020. The purpose of those site visits was to:

- verify the landscape characteristics identified via desktop means;
- conduct a photographic survey of the study area;
- verify, where possible, the sensitivity of visual receptor locations identified via desktop means;
- eliminate receptor locations that are unlikely to be influenced by the proposed development;
- identify any additional visually sensitive receptor locations within the study area; and
- inform the impact rating assessment of visually sensitive receptor locations (where possible).

1.4.4 Visual / Landscape Sensitivity

Areas of potential visual sensitivity along the power line assessment corridors were demarcated, these being areas where the establishment of a power line or other associated infrastructure would result in the greatest probability of visual impacts on potentially sensitive visual receptors. GIS-based visibility analysis was used to determine which route alternatives would be visible to the highest numbers of receptors in the study area.

In addition, the National Environmental Screening Tool (https://screening.environment.gov.za/screeningtool/) was examined to determine any relative landscape sensitivity in respect of the proposed development.

1.4.5 Impact Assessment

A rating matrix was used to objectively evaluate the significance of the visual impacts associated with the proposed development, both before and after implementing mitigation measures. Mitigation measures were identified (where possible) to minimise the visual impact of the proposed development. The rating matrix made use of several different factors including geographical extent, probability, reversibility, irreplaceable loss of resources, duration and intensity, in order to assign a level of significance to the visual impact of the project.

A separate rating matrix was used to assess the visual impact of the proposed development on each visual receptor location (both sensitive and potentially sensitive), as identified. This matrix is based on three (3) parameters, namely the distance of an identified visual receptor from the proposed development, the presence of screening factors and the degree to which the proposed development would contrast with the surrounding environment.

1.4.6 Consultation with I&APs

Continuous consultation with Interested and Affected Parties (I&APs) undertaken during the public participation process will be used (where available) to help establish how the proposed development will be perceived by the various receptor locations and the degree to which the impact will be regarded as negative. Although I&APs have not yet provided any feedback in this regard, the report will be updated to include relevant information as and when it becomes available. If no relevant comments are received requiring the report to be updated, the report will automatically inform the final BA report.

1.5 Source of Information

The main sources of information utilized for this VIA included:

- Project description for the proposed power line and substation development provided by Oya Energy;
- Elevation data from 25m Digital Elevation model (DEM) from the National Geo-Spatial Information (NGI);
- 1:50 000 topographical maps of South Africa from the NGI;
- Land cover and land use data extracted from the 2018 South African National Land-Cover Dataset provided by GEOTERRAIMAGE;
- Vegetation classification data extracted from the South African National Biodiversity Institute's (SANBI's) VEGMAP 2018 dataset;
- Google Earth Satellite imagery 2020;
- South African Renewable Energy EIA Application Database from Department of Environmental Affairs (incremental release Quarter 2 2020);
- The National Web-Based Environmental Screening Tool, Department of Environment, Forestry and Fisheries (DEFF);
- VIA for the proposed Kudusberg WEF, SiVEST 2019;
- VIA for the proposed Tooverberg WEF, SiVEST 2019;
- VIA for the proposed 132kV Power Line and Associated Substation to serve the Tooverberg Wind Energy Facility, SiVEST 2019; and
- VIA for the proposed Oya Energy Facility, SiVEST 2020.

2 ASSUMPTIONS AND LIMTATIONS

- Substations and power lines are very large structures by nature and could impact on receptors that are located relatively far away, particularly in areas of very flat terrain. Given the nature of the receiving environment and the height of the various components of the proposed development, the study area or visual assessment zone is assumed to encompass a zone of 5 km from the outer boundary of the combined power line assessment corridors and substation sites. This 5 km limit on the visual assessment

zone relates to the importance of distance when assessing visual impacts. Although the proposed development may still be visible beyond 5 km, the degree of visual impact would diminish considerably and as such the need to assess the impact on potential receptor locations beyond this distance would not be warranted.

- As previously stated, information pertaining to visual receptors is largely drawn from recent visual assessments conducted in the general vicinity of the proposed development. These studies include VIAs for the proposed Kudusberg WEF (SiVEST, 2019), Tooverberg WEF and grid connection infrastructure (SiVEST, 2019) and Oya Energy Facility (SiVEST, 2020). Receptors identification for all of these studies involved a combination of desktop assessment as well as field-based observations. Initially Google Earth imagery was used to identify potential receptors within the study area and where possible, these receptor locations were verified and assessed during site visits undertaken in July / August 2018 and in July 2020.

- Due to the extent of the respective study areas for previous VIA projects and the nature of the terrain, it was not possible to visit or verify every potentially sensitive visual receptor location. As such, several broad assumptions have been made in terms of the likely sensitivity of the receptors to the proposed development. It should be noted that not all receptor locations would necessarily perceive the proposed development in a negative way. This is usually dependent on the use of the facility, the economic dependency of the occupants on the scenic quality of views from the facility and on people's perceptions of the value of "Green Energy". Sensitive receptor locations typically include sites such as tourism facilities and scenic locations within natural settings which are likely to be adversely affected by the visual intrusion of the proposed development. Thus, the presence of a receptor in an area potentially affected by the proposed development does not necessarily mean that any visual impact will be experienced.

- For the purposes of the VIA, all analysis is based on a worst-case scenario where power line tower and substation structure heights are assumed to be 45m.

- Due to the varying scales and sources of information; maps may have minor inaccuracies. Terrain data for the study area derived from the National Geo-Spatial Information (NGI)'s 25m DEM is fairly coarse and somewhat inconsistent and as such, localised topographic variations in the landscape may not be reflected on the Digital Elevation Model (DEM) used to generate the viewsheds.

- In addition, the viewsheds produced do not take into account any existing vegetation cover or built infrastructure which may screen views of the proposed development and as such should be seen as a conceptual representation or a worst-case scenario.

- The potential visual impact at each visual receptor location was assessed using a matrix developed for this purpose. The matrix is based on three main parameters relating to visual impact and, although relatively simplistic, it provides a reasonably

accurate indicative assessment of the degree of visual impact likely to be experienced at each receptor location as a result of the proposed development. It is however important to note the limitations of quantitatively assessing a largely subjective or qualitative type of impact and as such the matrix should be seen merely as a representation of the likely visual impact at a receptor location.

- No feedback regarding the visual environment has been received from the public participation process to date. Any feedback from the public during the review period of the Draft Basic Assessment Report (DBAR) will however be incorporated into further drafts of this report, if relevant.

- It is assumed that operational and security lighting will be required for the substation proposed within the Oya Energy Facility (14/12/16/3/3/2/2009) development footprint. At the time of undertaking the visual study no information was available regarding the type and intensity of lighting required and therefore the potential impact of lighting at night has not been assessed at a detailed level. Accordingly, general measures to mitigate the impact of additional light sources on the ambiance of the nightscape have been provided.

- This study includes an assessment of the potential cumulative impacts of other renewable energy developments on the existing landscape character and on the identified sensitive receptors. This assessment is based on the information available at the time of writing the report and where information has not been available, broad assumptions have been made as to the likely impacts of these developments.

- SiVEST made every effort to obtain information for the surrounding planned renewable energy developments (including specialist studies, assessment reports and Environmental Management Programmes). However, some of the documents are not currently publicly available for download. The available information was factored into the cumulative impact assessment (**Section 8.4**).

- No visualisation modelling was undertaken for the proposed development as this is not normally required for linear infrastructure. This can however be provided should the Public Participation process identify the need for this exercise.

- It should be noted that all the site visits were undertaken during the winter months of July or August. The study area is however typically characterised by low levels of rainfall all year round and therefore the season is not expected to affect the significance of the visual impact of the proposed development.

- Clear weather conditions tend to prevail throughout most of the year in this area, and in these clear conditions, power lines and associated infrastructure would present a greater contrast with the surrounding landscape than they would on a cloudy overcast day. Both clear and cloudy weather conditions were experienced during the different site visits and these factors were taken into consideration when undertaking this VIA.

3 TECHNICAL DESCRIPTION

3.1 Project Location

The proposed power line and substations project area is located approximately 50 km north-west of Matjiesfontein, originating in the Namakwa Local Municipality in the Northern Cape and linking in to the Kappa substation in the Witzenberg Local Municipality in the Western Cape Province (**Figure 1**).

The proposed overhead power line corridors and substations will affect the following properties:

- Portion 2 of the Farm Bakovens Kloof No 152 (2/152);
- Remainder of the Farm Bakovens Kloof No 152 (RE/152);
- Portion 3 of the Farm Baakens Rivier No 155 (3/155);
- Remainder of the Farm Baakens Rivier No 155 (RE/155);
- Portion 1 of the Farm Gats Rivier No 156 (1/156);
- Remainder of the Farm Gats Rivier No 156 (RE/156);
- Portion 1 of the Farm Amandelboom No 158 (1/158);
- Remainder of the Farm Oliviers Berg No 159 (RE/159);
- Portion 2 of the Farm Bantamsfontein No 168 (2/168);
- Portion 4 of the Farm Bantamsfontein No 168 (4/168);
- Portion 5 of the Farm Bantamsfontein No 168 (5/168);
- Portion 7 of the Farm Bantamsfontein No 168 (7/168);
- Portion 13 of the Farm Bantamsfontein No 168 (13/168);
- Remainder of the Farm Bantamsfontein No 168 (RE/168);
- Remainder of the Farm Lower Roodewal No 169 (RE/169);
- Remainder of the Farm Matjes Fontein No 194 (RE/194);
- The Farm Platfontein No 240 (240);
- The Farm Die Brak No 241 (241);
- Portion 1 of the Farm Rietpoort No 243 (1/243);
- Remainder of the Farm Rietpoort No 243 (RE/243); and
- Remainder of the Farm Toover berg No 244 (RE/244).

As previously stated, the entire extent of the proposed 132kV overhead power line is located within a Strategic Transmission Corridor as defined and in terms of the procedures laid out in Government Notice (GN) No. 113, namely the Central Corridor.

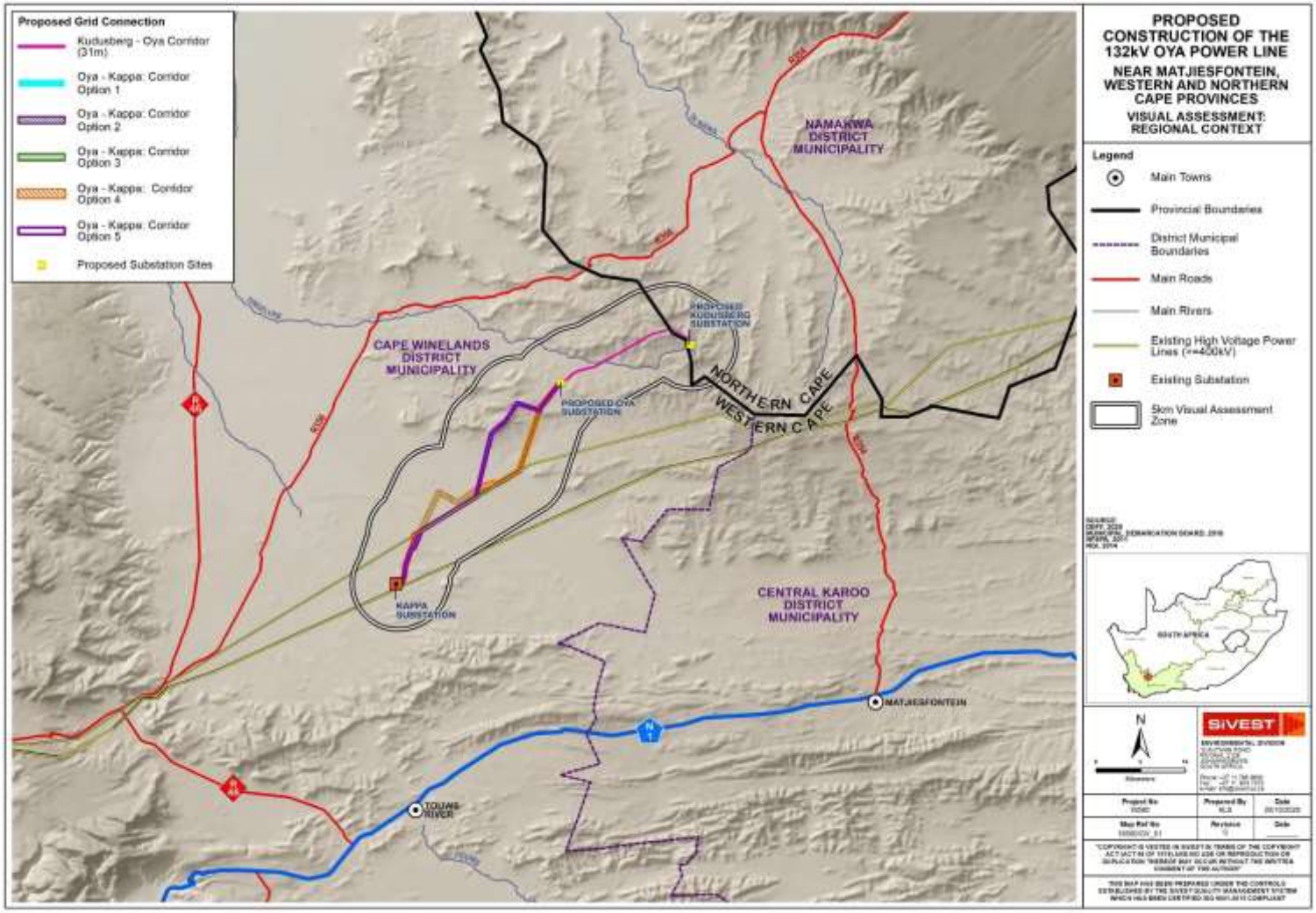

Figure 1: Proposed Power Line Route Alternatives and Substation in the Regional Context

3.2 Project Technical Details

At this stage, it is anticipated that the proposed development will include a 132kV power line and 2 (two) 33/132kV substations to feed electricity generated by the renewable energy facilities owned by the applicant into the national gird at the Kappa substation.

The type of power line towers being considered at this stage include both lattice and monopole towers and it is assumed that these towers will be located approximately 200m to 250m apart. The towers will be up to 45m in height, depending on the terrain, but will ensure minimum overhead line clearances from buildings and surrounding infrastructure.

300m wide power line corridors are being assessed to allow flexibility when determining the final route alignment. The proposed power line however only requires a 31m wide servitude and as such, this servitude would be positioned within the assessed corridor.

The size of the proposed Oya and Kudusberg substation sites will be approximately 4 hectares (ha) each.

3.2.1 Route Alternatives

Only one (1) route is technically feasible for the section of the proposed power line connecting the Kudusberg on-site substation (authorised under 14/12/16/3/3/1/1976/AM1) to the Oya on-site substation (i.e. Kudusberg to Oya). This section of the power line corridor route is approximately 16.6km in length and runs from the Kudusberg on-site substation along the RE/194, 1/158, RE/159, RE/156, 1/156 and RE/155 properties to the Oya on-site substation.

Five (5) power line corridor route alternatives are being assessed for the section of the proposed overhead power line which connects the Oya on-site substation to the Kappa substation (i.e. Oya to Kappa). These alternatives, as depicted in **Figure 2**, are described below:

- **Power Line Corridor Alternative 1 (Oya to Kappa):** Approximately 34.14km in length and running across or along the boundaries of the farms RE/155, RE/152, 2/152, RE/169, RE/243, 241, 240 and RE/244 properties to the Kappa substation;
- **Power Line Corridor Alternative 2 (Oya to Kappa):** Approximately 32.43km in length and running across or along the boundaries of the farms RE/155, 3/155, RE/152, 2/152, RE/169, 13/168, 5/168, 1/243, RE/243, 241 and 240 properties to the Kappa substation;
- **Power Line Corridor Alternative 3 (Oya to Kappa):** Approximately 30.56km in length and running across or along the boundaries of the farms RE/155, 4/168, 13/168, 5/168, 1/243, 240 and RE/244 properties to the Kappa substation;
- **Power Line Corridor Alternative 4 (Oya to Kappa):** Approximately 32.94km in length and running across or along the boundaries of the farms RE/155, 4/168, 13/168, RE/169, RE/243, 241 and 240 properties to the Kappa substation;
- **Power Line Corridor Alternative 5 (Oya to Kappa):** Approximately 32.26km in length and running across or along the boundaries of the farms RE/155, RE/152, 2/152, RE/169, 5/168, 1/243 and 240 properties to the Kappa substation.

3.2.2 'No-Go' Alternative

The 'no-go' alternative is the option of not developing the proposed project, thus preventing the energy facilities in the area from feeding electricity into the national grid. This alternative would not result in any environmental impacts within the assessment corridors or in the surrounding local area and the status quo would remain. This scenario provides the baseline against which other alternatives are compared and will be considered throughout the report.

While the 'no-go' option is a feasible option, it would prevent the proposed development from contributing to the environmental, social and economic benefits associated with the development of the renewables sector.

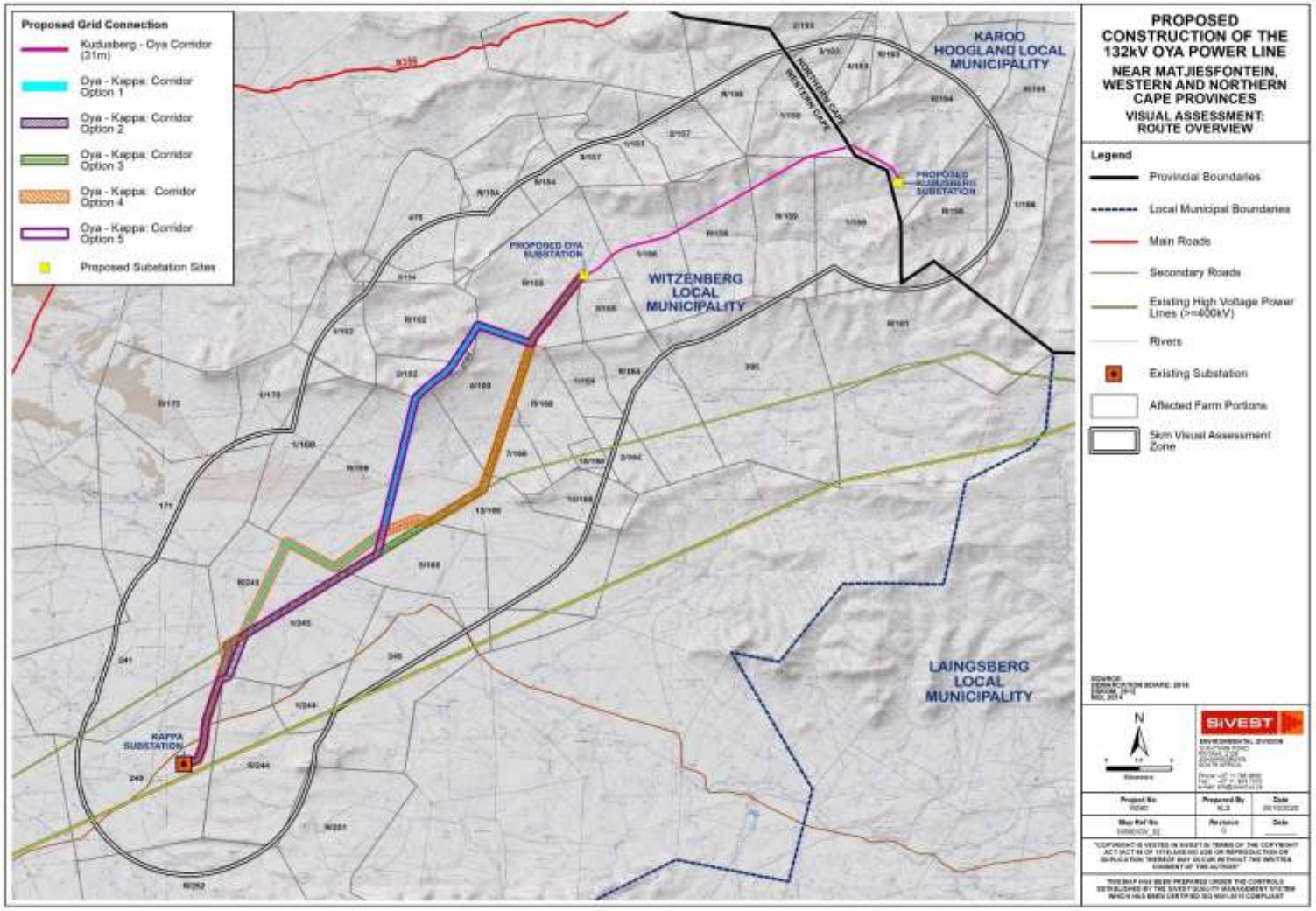

Figure 2: Overview of Power Line Route Alternatives

4 LEGAL REQUIREMENTS AND GUIDELINES

Key legal requirements pertaining to the proposed development are as follows:

In terms of the NEMA and the EIA Regulations 2014 (as amended), the proposed development includes listed activities which require a BA to be undertaken. As previously stated, the entire extent of the proposed 132kV overhead power line is located within one of the Strategic Transmission Corridors as defined and in terms of the procedures laid out in Government Notice (GN) No. 113, namely the Central Corridor. The proposed overhead power line and substation project irrespective would be subject to a BA process in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) (as amended) and Appendix 1 of the EIA Regulations, 2014 promulgated in Government Gazette 40772 and GN R326, R327, R325 and R324 on 7 April 2017. The competent authority for this BA is the national Department of Environment, Forestry and Fisheries (DEFF).

As part of this BA process, the need for a VIA to be undertaken has been identified in order to assess the visual impact of the proposed grid connection infrastructure. The VIA must adhere to the requirements for specialist studies as stipulated in Appendix 6 of the NEMA EIA Regulations, 2014, as amended;

There is currently no legislation within South Africa that explicitly pertains to the assessment of visual impacts, however, in addition to the NEMA the following legislation has relevance to the protection of scenic resources:

- National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003); and
- National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA).

Based on these Acts, protected or conservation areas and sites or routes with cultural or symbolic value have been taken into consideration when identifying sensitive and potentially sensitive receptor locations and rating the sensitivity of the study area.

5 FACTORS INFLUENCING VISUAL IMPACT

5.1 Subjective experience of the viewer

The perception of the viewer/receptor toward an impact is highly subjective and involves 'value judgements' on behalf of the receptor. It is largely based on the viewer's perception and is usually dependent on the age, gender, activity preferences, time spent within the landscape and traditions of the viewer (Barthwal, 2002). Thus, certain receptors may not consider power lines and associated infrastructure to be a negative visual impact as they are often associated with employment creation, social upliftment and the general growth and progression of an area, and thus the development could even have positive connotations.

5.2 Visual environment

Power lines and substations are not features of the natural environment but are rather a representation of human (anthropogenic) alteration. As such, this type of development is likely to be perceived as visually intrusive when placed in largely undeveloped landscapes that have a natural scenic quality and where tourism activities, based upon the enjoyment of (or exposure to) the scenic or aesthetic character of the area, are practiced. Residents and visitors to these areas could perceive the power lines, substations and associated infrastructure to be highly incongruous in this context and may regard these features as an unwelcome intrusion which degrade the natural character and scenic beauty of the area, and which could potentially even compromise the practising of tourism activities in the area. The experience of the viewer is however highly subjective and there are those who may not perceive features such as power lines and substations as a visual intrusion.

The presence of other anthropogenic features associated with the built environment may not only obstruct views but also influence the perception of whether a development is a visual impact. In industrial areas for example, where other infrastructure and built form already exists, the visual environment could be considered to be 'degraded' and thus the introduction of a new power line or substation into this setting may be considered to be less visually intrusive than if there was no existing built infrastructure visible.

5.3 Type of visual receptor

Visual impacts can be experienced by different types of receptors, including people living, working or driving along roads within the viewshed of the proposed development. The receptor type in turn affects the nature of the typical 'view', with views being permanent in the case of a residence or other places of human habitation, or transient in the case of vehicles moving along a road. The nature of the view experienced affects the intensity of the visual impact experienced.

It is important to note that visual impacts are only experienced when there are receptors present to experience this impact. Thus, where there are no human receptors or viewers present there are not likely to be any visual impacts experienced.

5.4 Viewing distance

Viewing distance is a critical factor in the experiencing of visual impacts, as beyond a certain distance, even large developments tend to be much less visible, and difficult to differentiate from the surrounding landscape. The visibility of an object is likely to decrease exponentially as one moves away from the source of impact, with the impact at 1 000m being considerably less than the impact at a distance of 500m **(Figure 3)**.

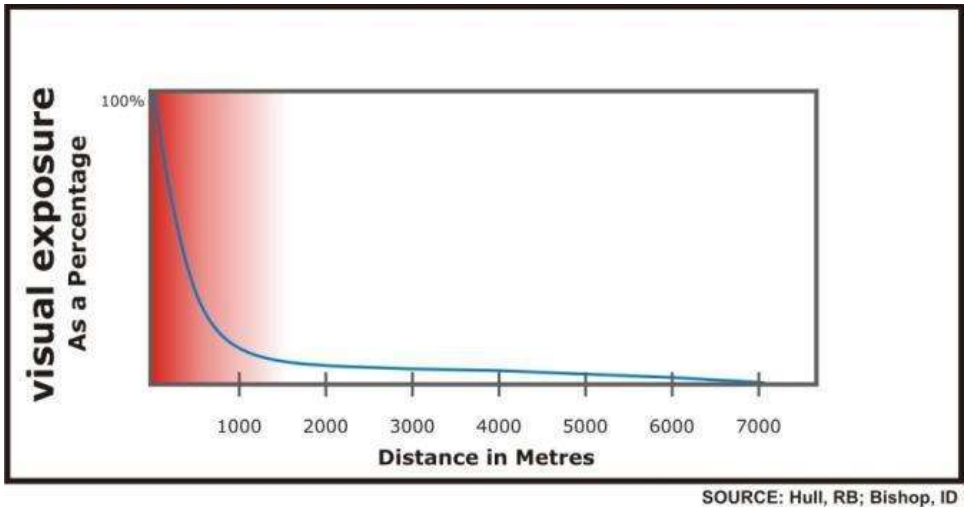

Figure 3: Conceptual representation of diminishing visual exposure over distance

6 VISUAL CHARACTER AND SENSITIVITY OF THE STUDY AREA

Defining the visual character of an area is an important factor in the assessment of visual impacts as it establishes the visual baseline or existing visual environment in which the development would be constructed. The visual impact of a development is measured by establishing the degree to which the development would contrast with, or conform to, the visual character of the surrounding area. The inherent sensitivity of the area to visual impacts or visual sensitivity is thereafter determined, based on the visual character, the economic importance of the scenic quality of the area, inherent cultural value of the area and the presence of visual receptors.

Physical and land use related characteristics, as outlined below, are important factors contributing to the visual character of an area.

6.1 Physical and Land Use Characteristics

6.1.1 Topography

The proposed power line and substations are located in the scenic Karoo region of the Western / Northern Cape which is generally associated with wide vistas and mountainous landscapes. The topography in the broader study area is largely dominated by the mountains/hills at the southern end of the Klein Roggeveld range. Much of the north-eastern sector of the study area is therefore dominated by the steep slopes and broad ridges of these mountains and escarpments **(Figure 4)**.

The south-eastern sector of the study area is however characterised by flat to gently undulating plains interspersed with areas of localised hills and koppies **(Figure 5 and Figure 6)**.

Maps showing the topography and slopes within and in the immediate vicinity of the combined assessment area are provided in **Figure 7** and **Figure 8** below**.**

Figure 4: View (NE), from Portion 1 of the Farm Brandenburg No 164 (-32.950424S; 20.2035E) showing mountainous terrain to the north.

Figure 5: View (NE) from the Gatsrivier road (-33.139302S; 19.957718E), some 2kms south-west of Kappa Substation showing the relatively flat terrain of in the southern section of the assessment area, with more mountainous terrain to the north.

Figure 6: Example of some of the localised hills / koppies in the study area.

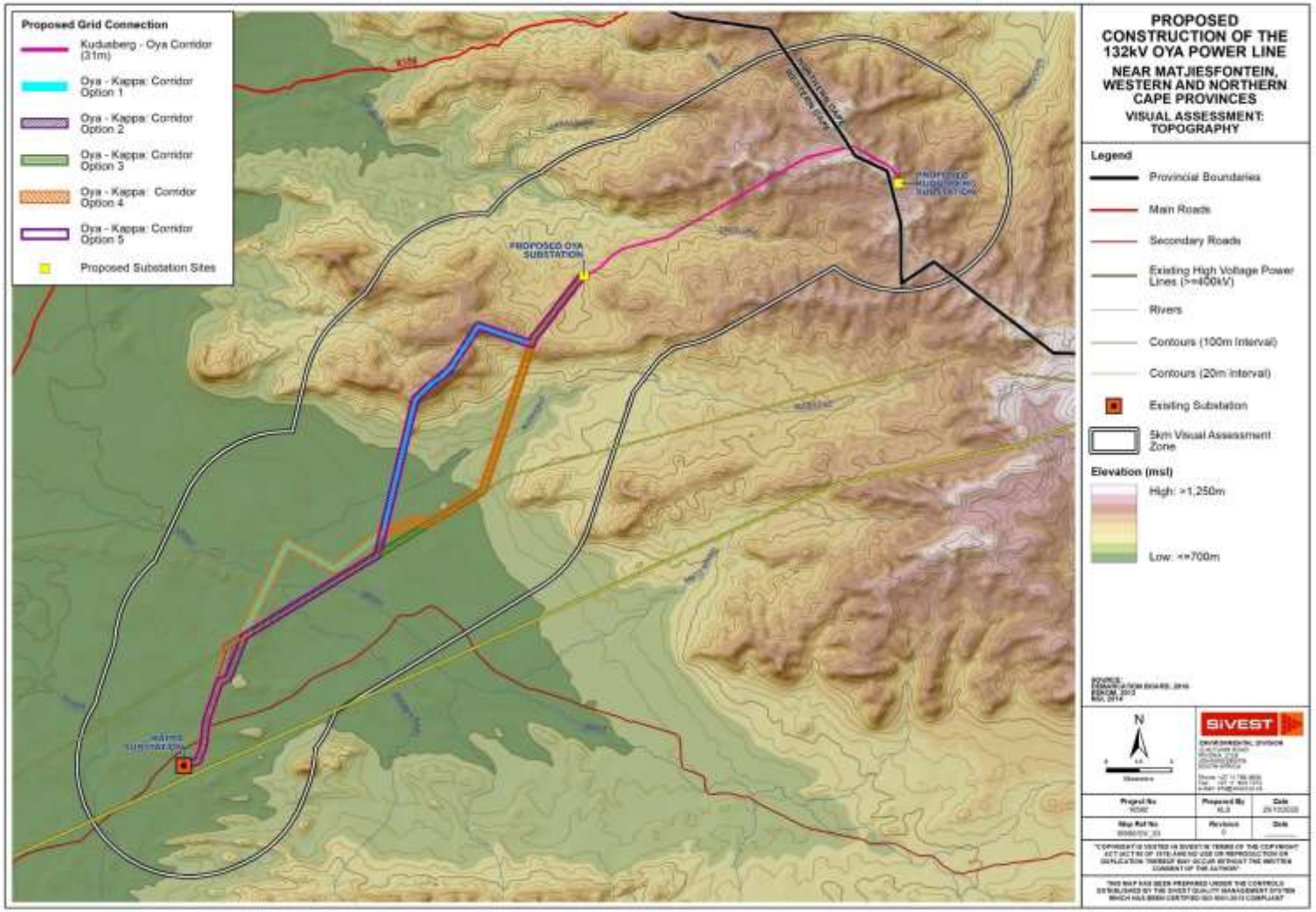

Figure 7: Topography of the study area

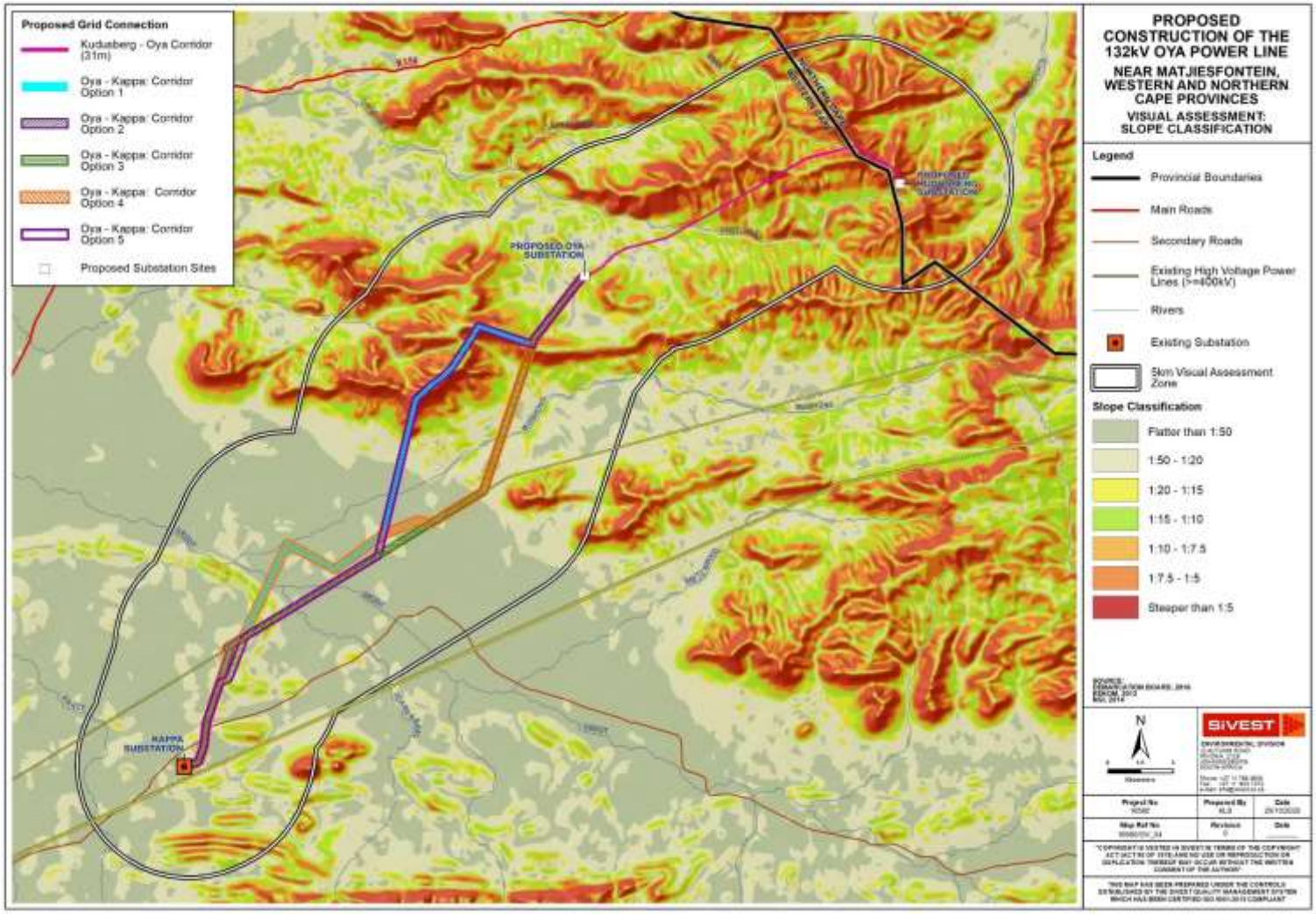

Figure 8: Slope classification of the study area

Visual Implications

Areas of flatter relief, including the plains and the higher-lying plateaus, are characterised by wide ranging vistas (**Figure 9**), although views to the north and south will be somewhat constrained by the hilly terrain in these sectors of the study area which enclose the visual envelope. In the hillier and higher-lying terrain, the vistas will depend on the position of the viewer. Viewers located within some of the more incised valleys for example, would have limited vistas, whereas a much wider vista would be experienced by viewers on higher-lying ridge tops or slopes. Importantly in the context of this study, the same is true of objects placed at different elevations and within different landscape settings. Objects placed on high-elevation slopes or ridge tops would be highly visible, while those placed in valleys or enclosed plateaus would be far less visible.

Bearing in mind that power line towers and substations are large structures (towers could potentially be up to 45 m in height), these elements of the grid connection could be visible from a relatively extensive area around the grid connection infrastructure. Topographic shielding in the north-eastern sector would reduce the visibility of the power lines and substations from many of the locally occurring receptor locations. Across the south-western sector of the study area however there would be very little topographic shielding to lessen the visual impact of the proposed power line and substations.

Figure 9: View west-south-west from the southern section of the study area **(**-33.066028S**;** 20.090783**E)** showing wide-ranging vistas experienced from higher elevations.

GIS technology was used to undertake a preliminary visibility analysis for the proposed power line routes and substation sites. This analysis was based on points at 250 m intervals along the centre line of the corridor alternatives, and assumes a tower height of 45 m. The resulting

viewshed indicates the geographical area from where the proposed power lines and substation sites would theoretically be visible, i.e. the zone of visual influence. This analysis is based entirely on topography (relative elevation and aspect) and does not take into account any existing vegetation cover or built infrastructure which may screen views of the proposed development. In addition, detailed topographic data was not available for the broader study area and as such the viewshed analysis does not take into account any localised topographic variations which may constrain views. This analysis should therefore be seen as a conceptual representation or a worst case scenario.

The results of this analysis, as per **Figure 10** below, show that elements of the proposed grid connection infrastructure would be visible from most parts of the study area.

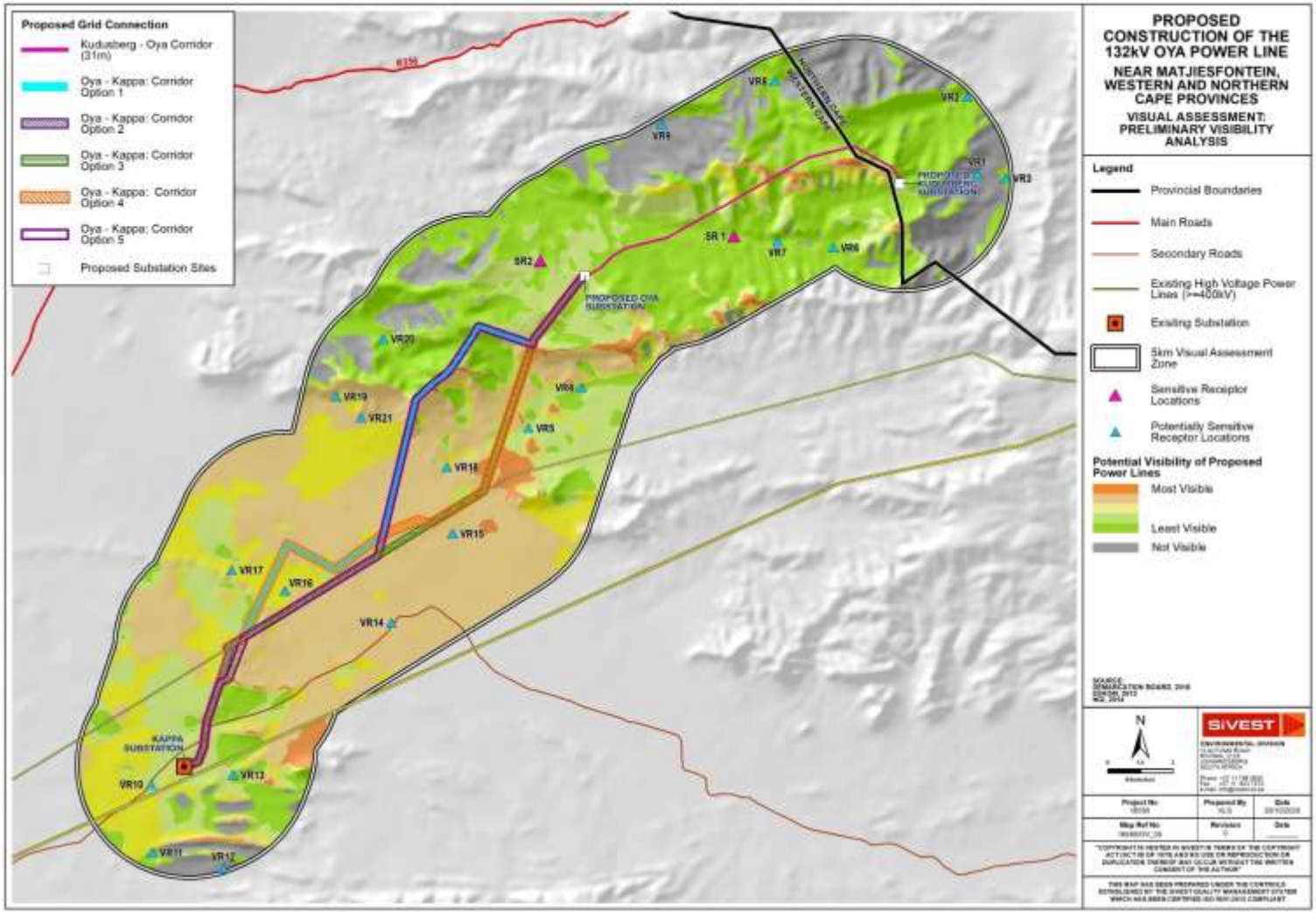

Figure 10: Preliminary visibility analysis of proposed development

6.1.2 Vegetation

According to Mucina and Rutherford (2012), much of the north-eastern sector of the study area is covered by the Koedoesberge – Moordenaars Karoo vegetation type, which tends to occur on slightly undulating hills to hilly landscapes. This vegetation type comprises low succulent scrubs, scattered tall shrubs and patches of “white” grass visible on plains **(Figure 11)**. The dwarf shrubs include Pteronia, Drosanthemum and Galenia.

Figure 11: Typical vegetation cover prevalent across the study area

The northern and eastern sections of the study area which are dominated by high mountains / hills, are however classified as Central Mountain Shale Renosterveld. This vegetation type is typically found on slopes and broad ridges of low mountains and escarpments, with taller shrubland dominated by renosterbos and large areas of mainly non-succulent karoo shrubs and with a rich geophytic flora in the undergrowth or in more open, wetter or rocky habitats (**Figure 12**).

Figure 12: Typical vegetation cover found on slopes and broad ridges of the mountains / hills

The south-western sector of the study area is covered by the Tanqua Karoo vegetation type which tends to occur in intra-mountain basin landscapes where slightly undulating terrain is sheltered by the steep slopes of mountain ranges (**Figure 12**). On the flatter plains which tend to be sparsely vegetated, this vegetation type comprises low succulent shrubs. The slopes of the koppies and the adjacent foothills however support medium-tall succulent shrubland (**Figure 13**). The flatter plains in the central sector of the study area are covered by the Tanqua Wash Riviere vegetation type which largely comprises sparse shrubland in these areas.

Figure 13: Typical vegetation cover in the south-western sector of the study area

Much of the study area however is still characterised by natural low shrubland with transformation limited to patches of cultivation and a few isolated areas where pastoral activities such as livestock rearing are taking place.

Vegetation classifications across the study area are shown in **Figure 16** below.

Visual Implications

Vegetation cover across the study area is predominantly short and sparse and thus will not provide any visual screening (**Figure 14)**. In some instances however, taller trees have been planted around farmhouses, possibly restricting views from these receptor locations to some degree (**Figure 15**).

Figure 14: Short, sparse vegetation cover in the area does not provide any visual screening

Figure 15: Trees planted around a farmstead in the south-western sector of the study area

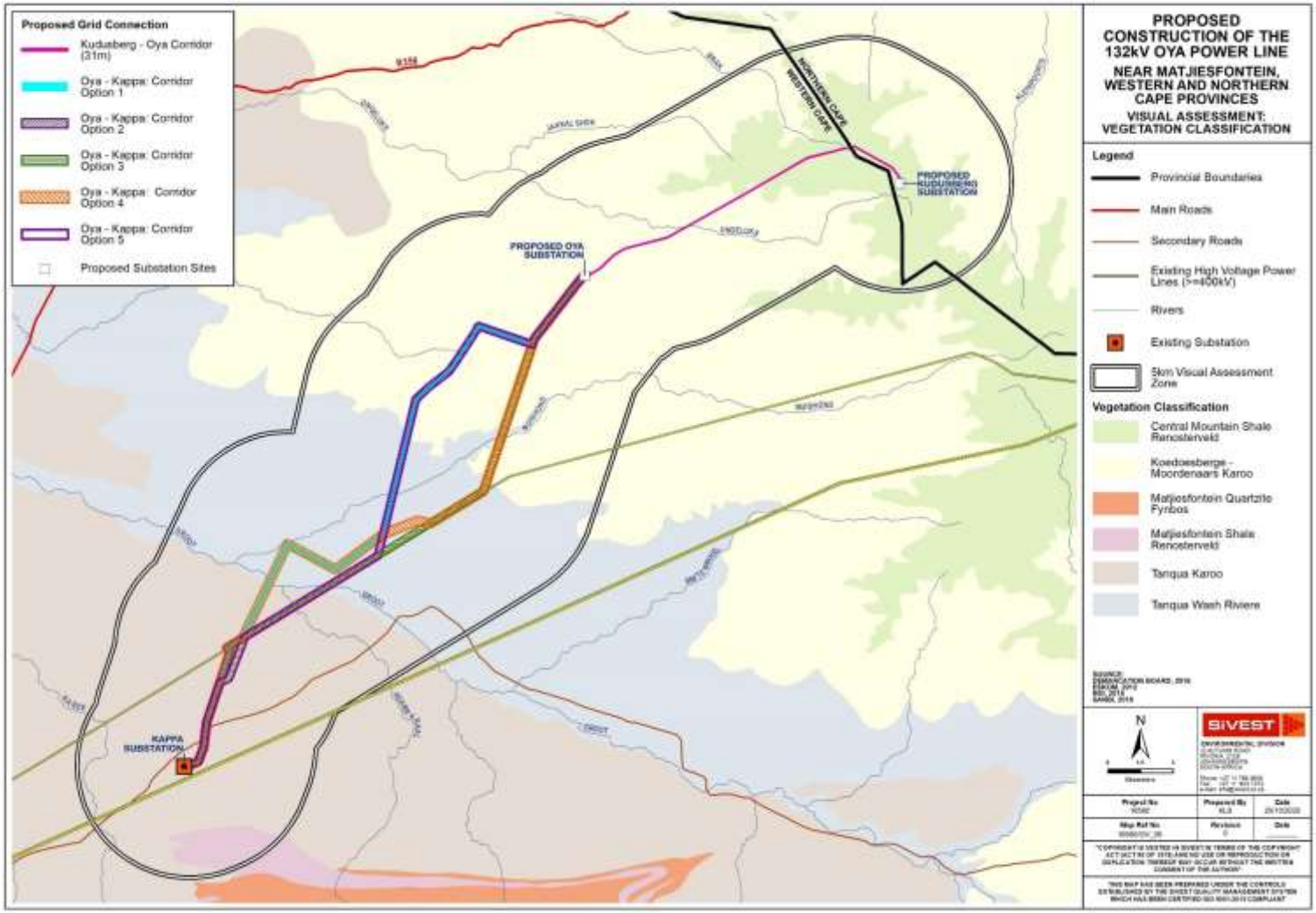

Figure 16: Vegetation Classification in the Study Area

6.1.3 Land Use

According to the South African National Land Cover dataset (GeoTerra Image 2018), much of the visual assessment area is characterised by natural vegetation which is dominated by Karoo and Fynbos shrubland interspersed with natural grassland (**Figure 17**).

Agricultural activity in the area is restricted by the arid nature of the local climate and areas of cultivation are largely confined to relatively limited areas distributed along drainage lines. As such, the natural vegetation has been retained across much of the study area. Livestock farming (mostly sheep) is the dominant activity (**Figure 18**), although the climatic and soil conditions have resulted in low densities of livestock and relatively large farm properties across the area. Thus, the area has a very low density of rural settlement, with relatively few scattered farmsteads in evidence (**Figure 19**). Built form in much of the study area is limited to isolated farmsteads, including farm worker's dwellings and ancillary farm buildings, gravel access roads, telephone lines, fences and windmills (**Figure 20**).

High voltage power lines in the study area however form significant man-made features in an otherwise undeveloped landscape. These power lines include 765kV power lines (**Figure 21**) and 400kV power lines which bisect the south-western sector of the study area in a south-west to north-east alignment. In addition, the Kappa 765/400kV substation, situated at the southern end of the power line assessment corridors, is a substantial anthropogenic feature with a distinctly more industrial character, resulting in a significant degree of transformation in the landscape (**Figure 22**).

In addition, the Perdekraal East wind farm is located in the south-western sector of the study area. Construction of this facility has only recently been completed and the landscape has undergone significant transformation as a result of the construction activities (**Figure 23**).

Further human influence is visible in the area in the form of the DR1475 District Road which traverses the south-western sector of the study area in a west to north-east direction. This is however a gravel road and thus conforms to the typical natural rural character of the study area.

The closest built-up area is the small town of Touws River which is situated approximately 26km south of Kappa Substation while Matjiesfontein is some 55kms to the south-east. These small towns are well outside the visual assessment zone and thus not expected to have an impact on the visual character of the study area.

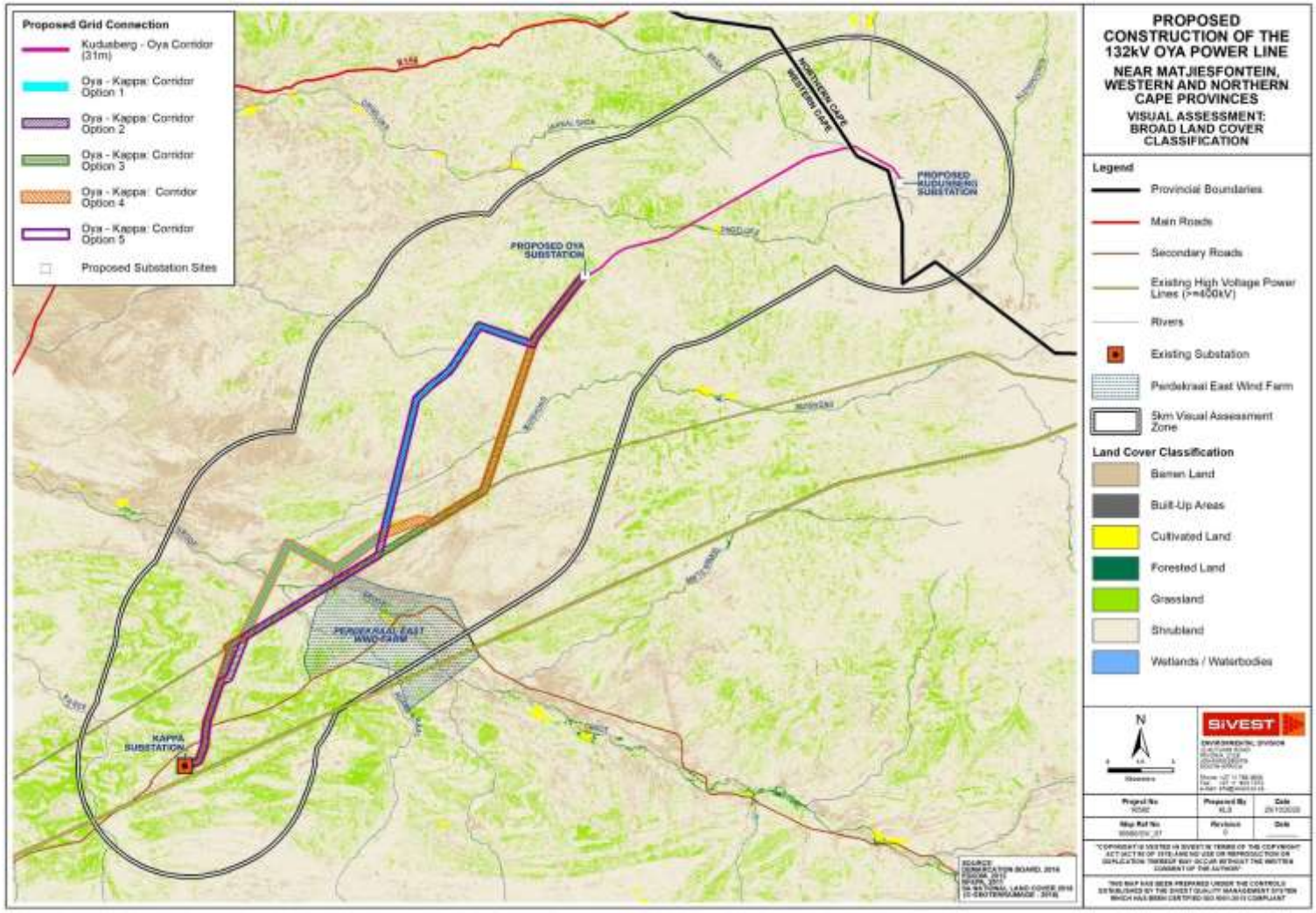

Figure 17: Land Cover Classification of the study area

Figure 18: Sheep grazing near Kappa Substation

Figure 19: Isolated farmstead on Portion 1 of the Farm Brandenburg No 164

Figure 20: Typical view of built form in the study area, including scattered farmhouses, power lines and telephone poles.

Figure 21: View of high voltage power lines in the study area

Figure 22: Kappa Substation

Figure 23: Operational wind turbines at Perdekraal East Wind Farm

Visual Implications

Sparse human habitation and the predominance of natural vegetation cover across much of the study area would give the viewer the general impression of a largely natural setting with some pastoral elements. In addition, there are no towns or settlements in the study area and

thus, there are very low levels of human transformation and visual degradation across much of the study area.

Significant elements of human transformation are however present in the south-western sector of the study area, including high voltage power lines, Kappa Substation and the Perdekraal East Wind Farm. These elements are considered to have degraded the visual character to some degree.

The influence of the level of human transformation on the visual character of the area is described in more detail below.

6.2 Visual Character and Cultural Value

The above physical and land use-related characteristics of the study area contribute to its overall visual character. Visual character largely depends on the level of change or transformation from a natural baseline in which there is little evidence of human transformation of the landscape. Varying degrees of human transformation of a landscape would engender differing visual characteristics to that landscape, with a highly modified urban or industrial landscape being at the opposite end of the scale to a largely natural undisturbed landscape. Visual character is also influenced by the presence of built infrastructure such as buildings, roads and other objects such as telephone or electrical infrastructure. The visual character of an area largely determines the **sense of place** relevant to the area. This is the unique quality or character of a place, whether natural, rural or urban which results in a uniqueness, distinctiveness or strong identity.

Agricultural activities in the area have not transformed the natural landscape to any significant degree and there are no towns or built-up areas in the study area influencing the overall visual character. Thus there are very low levels of human transformation and visual degradation across much of the study area and the natural character has been retained.

Prominent anthropogenic elements in the study area however include a large electrical substation (Kappa), associated high voltage power lines and the recently constructed Perdekraal East wind farm. The presence of this infrastructure is an important factor in this context, as the introduction of the proposed power line and substation infrastructure would result in less visual contrast where other anthropogenic elements are already present.

The construction of the Perdekraal East WEF and the associated 132kV power line is a significant factor in the visual character of the study area. WEFs and their associated infrastructure typically consist of very large structures which are highly visible. As such, this facility has significantly altered the visual character and baseline in the south-eastern sector of the study area, resulting in a more industrial-type visual character.

The scenic quality of the landscape is also an important factor contributing to the visual character of an area or the inherent sense of place. Visual appeal is often associated with unique natural features or distinct variations in landform. As such, the hilly / mountainous terrain which occurs in the north-eastern sector of the study area is considered to be an important feature that increases the scenic appeal and visual interest in the area.

The greater area surrounding the proposed development is an important component when assessing visual character. The area can be considered to be typical of a Karoo or “platteland” landscape that would characteristically be encountered across the high-lying dry western and central interior of South Africa. Much of South Africa’s dry Karoo interior consists of wide open, uninhabited spaces sparsely punctuated by scattered farmsteads and small towns. Over the last couple of decades an increasing number of tourism routes have been established in the Karoo and in a context of increasing urbanisation in South Africa’s major centres, the Karoo is

being marketed as an undisturbed getaway. Examples of this may be found in the “Getaway Guide to Karoo, Namaqualand and Kalahari” (Moseley and Naude-Moseley, 2008).

The typical Karoo landscape can be considered a valuable ‘cultural landscape’ in the South African context. Although the cultural landscape concept is relatively new, it is becoming an increasingly important concept in terms of the preservation and management of rural and urban settings across the world (Breedlove, 2002).

The Karoo landscape, consisting of wide-open plains, and isolated relief, interspersed with isolated farmsteads, windmills and stock holding pens, is an important part of the cultural matrix of the South African environment. The Karoo farmstead is also a representation of how the harsh arid nature of the environment in this part of the country has shaped the predominant land use and economic activity practiced in the area, as well as the patterns of human habitation and interaction. The presence of small towns, such as Touws River and Matjiesfontein, engulfed by an otherwise rural, almost barren environment, form an integral part of the wider Karoo landscape. As such, the Karoo landscape as it exists today has value as a cultural landscape in the South African context.

In light of this, it is important to assess whether the introduction of a new power line and associated infrastructure into the study area would be a degrading factor in the context of the natural Karoo character of the landscape. Broadly speaking, visual impacts on the cultural landscape in the area around the proposed development would be reduced by the fact that the area is very remote and there are no significant tourism enterprises attracting visitors into the study area. In addition, the nearest major scenic routes (N1 and R355) are some considerable distance away and are not expected to experience any visual impacts from the proposed development.

A detailed assessment of the potential impacts of the proposed power line and substation development on the cultural landscape has been included in the Heritage Impact Assessment (HIA) undertaken by CTS Heritage in respect of the proposed project. Although this study identified cultural landscape features of significance, it was concluded that the proposed development is unlikely to have a negative impact on significant heritage resources situated within the corridor for the proposed Oya power line provided that the proposed mitigation measures including buffer areas and ‘no-go’ areas are implemented.

6.3 Visual Sensitivity

Visual sensitivity can be defined as the inherent sensitivity of an area to potential visual impacts associated with a proposed development. It is based on the physical characteristics of the area (i.e. topography, landform and land cover), the spatial distribution of potential receptors, and the likely value judgements of these receptors towards a new development (Oberholzer: 2005). A viewer's perception is usually based on the perceived aesthetic appeal of an area and on the presence of economic activities (such as recreational tourism) which may be based on this aesthetic appeal.

In order to assess the visual sensitivity of the area, SiVEST has developed a matrix based on the characteristics of the receiving environment which, according to the Guidelines for Involving Visual and Aesthetic Specialists in the EIA Processes, indicate that visibility and aesthetics are likely to be 'key issues' (Oberholzer: 2005).

Based on the criteria in the matrix (**Table 2**), the visual sensitivity of the area is broken up into a number of categories, as described below:

i) **High** - The introduction of a new development such as a power line and/or substation would be likely to be perceived negatively by receptors in this area; it would be considered to be a visual intrusion and may elicit opposition from these receptors.
ii) **Moderate** – Receptors are present, but due to the nature of the existing visual character of the area and likely value judgements of receptors, there would be limited negative perception towards the new development as a source of visual impact.
iii) **Low** - The introduction of a new development would not be perceived to be negative, there would be little opposition or negative perception towards it.

The table below outlines the factors used to rate the visual sensitivity of the study area. The ratings are specific to the visual context of the receiving environment within the study area.

Table 2: Environmental factors used to define visual sensitivity of the study area

FACTORS	DESCRIPTION	RATING									
		LOW									*HIGH*
		1	2	3	4	5	6	7	8	9	10
Pristine / natural / scenic character of the environment	Study area is largely natural with areas of scenic value and some pastoral elements.										
Presence of sensitive visual receptors	Relatively few sensitive receptors have been identified in the study area.										
Aesthetic sense of place / visual character	Visual character is typical of Karoo Cultural landscape.										
Irreplaceability / uniqueness / scarcity value	Although there are areas of scenic value within the study area, these are not rated as highly unique.										
Cultural or symbolic meaning	Much of the area is typical of a Karoo Cultural landscape.										
Protected / conservation areas in the study area	No protected or conservation areas were identified in the study area.										
Sites of special interest present in the study area	No sites of special interest were identified in the study area.										
Economic dependency on scenic quality	Few tourism/leisure-based facilities in the area										
International / regional / local status of the environment	Study area is typical of Karoo landscapes										
**Scenic quality under threat / at risk of change	Introduction of grid connection infrastructure will alter the visual character and sense of place. In addition, the development of other renewable energy facilities in the broader area as planned or under construction will introduce an increasingly industrial character, giving rise to significant cumulative impacts										

**Any rating above '5' for this specific aspect will trigger the need to undertake an assessment of cumulative visual impacts.

Low				Moderate					High
10	20	30	40	50	60	70	80	90	100

Based on the above factors, the total score for the study area is 41, which according to the scale above, would result in the area being rated as having a low visual sensitivity. It should be stressed however that the concept of visual sensitivity has been utilised indicatively to provide a broad-scale indication of whether the landscape is likely to be sensitive to visual impacts, and is based on the physical characteristics of the study area, economic activities and land use that predominates. An important factor contributing to the visual sensitivity of an area is the presence, or absence of visual receptors that may value the aesthetic quality of the landscape and depend on it to produce revenue and create jobs.

No formal protected areas were identified in the study area and relatively few sensitive or potentially sensitive receptors were found to be present.

As part of the visual sensitivity assessment, a screening exercise was undertaken with the aim of indicating any areas that should be precluded from the proposed development footprint. From a visual perspective, these are areas where the establishment of power lines and/or substations would result in the greatest probability of visual impacts on sensitive or potentially sensitive visual receptors.

Using GIS-based visibility analysis, it was possible to determine which sectors of the application site would be visible to the highest numbers of receptors in the study area (**Figure 24**). This analysis considered all the sensitive and potentially sensitive receptor locations identified (**Section 8.1**). Due to the fact that there are relatively few receptors, widely scattered across the area, no sections of the proposed route alignments were found to be significantly more sensitive than any others. Accordingly, areas visible to more than 33% of the receptors were rated as areas of potentially 'high visual sensitivity'. However, as the study area as a whole is rated as having a low to moderate visual sensitivity, the sensitivity rating would be reduced to "Medium-High". Hence these areas are **not** considered to be "no go areas", but rather should be viewed as zones where development would be least preferred.

It should be noted that the visibility analysis is based purely on topographic data available for the broader study area and does not take into account any localised topographic variations or any existing infrastructure and / or vegetation which may constrain views. In addition, the analysis does not consider differing perceptions of the viewer which would largely determine the degree of visual impact being experienced.

The visual sensitivity analysis should therefore be seen as a conceptual representation or a worst-case scenario which rates the visibility of the site in relation to potentially sensitive receptors.

In addition to the sensitivity ratings, a 500 m exclusion zone has been delineated around the identified receptors in the study area. It is recommended that grid infrastructure should not be

developed within these buffer zones so as to reduce visual impacts of the power line on these receptors.

These areas of visual sensitivity are shown in **Figure 24** below.

In assessing visual sensitivity, the Landscape Theme of the National Environmental Screening Tool was used to determine the relative landscape sensitivity for the development of grid connection infrastructure. The tool does not however identify any landscape sensitivities in respect of the proposed power line or substation.

6.4 Visual Absorption Capacity

Visual absorption capacity is the ability of the landscape to absorb a new development without any significant change in the visual character and quality of the landscape. The level of absorption capacity is largely based on the physical characteristics of the landscape (topography and vegetation cover) and the level of transformation present in the landscape.

Although the undulating topography in the study would increase the visual absorption capacity, this would be offset by the lack of screening provided by the dominant shrubland vegetation. A significant portion of the study area has however already undergone significant transformation as a result of the Kappa substation and associated high voltage power lines and further transformation has occurred with the construction of the Perdekraal East Windfarm, thus increasing the visual absorption capacity of the landscape.

Visual absorption capacity in the study area is therefore rated as moderate.

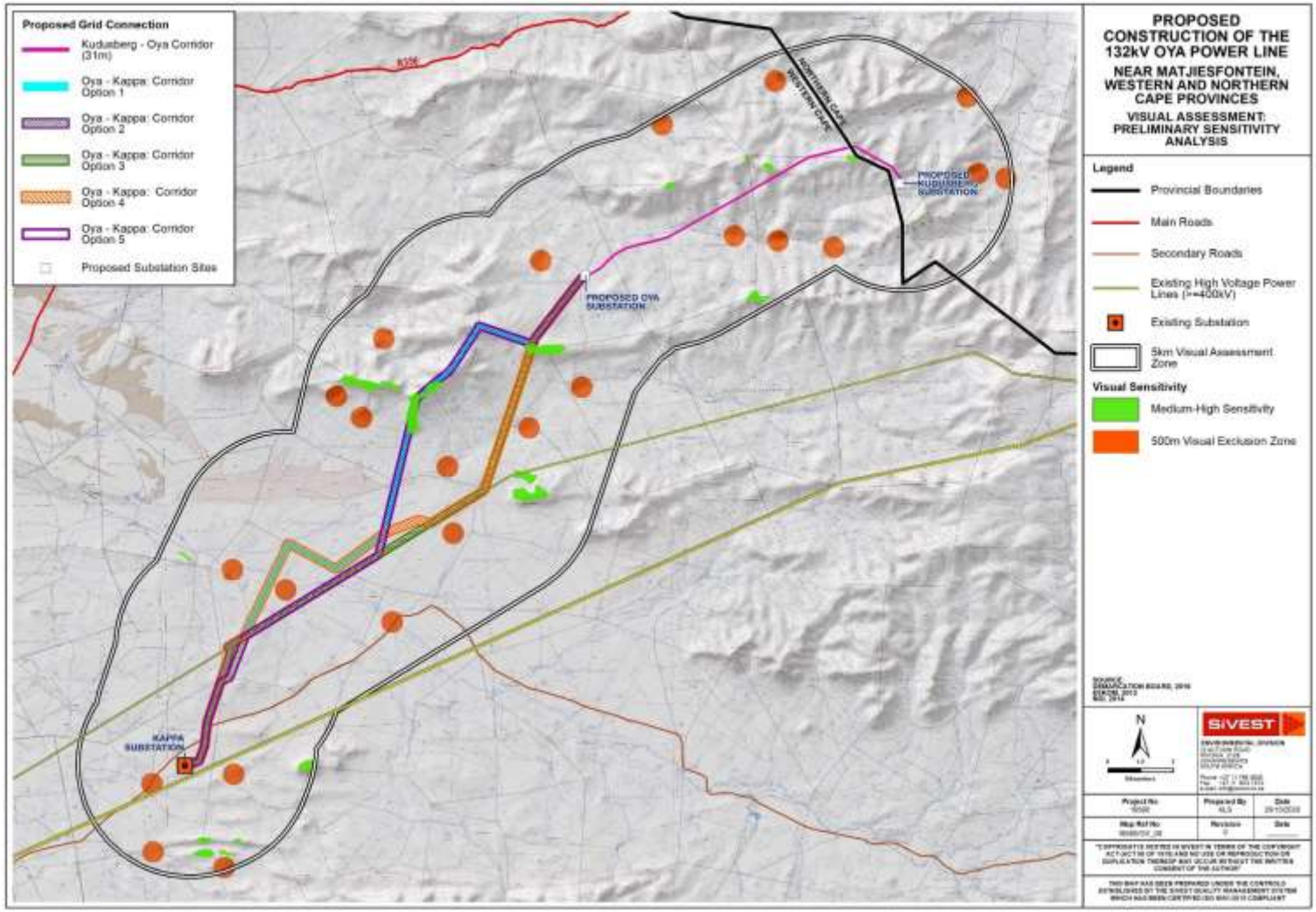

Figure 24: Preliminary visual sensitivity analysis of proposed development**.**

7 TYPICAL VISUAL IMPACTS ASSOCIATED WITH ON-SITE SUBSTATIONS AND POWER LINES

In this section, the typical visual issues related to the establishment of a 132kV power line and substation are discussed

Power line towers and substations are very large objects and thus highly visible. According to the project description provided by Oya Energy, the maximum tower height envisaged for the proposed power line is 45m (equivalent in height to a fifteen storey building). Although a tower structure would be less visible than a building, the height of the structure means that the tower would still typically be visible from a considerable distance. Visibility would be increased by the fact that the power line comprises a series of towers typically spaced approximately 200m to 250m apart in a linear alignment.

The degree of visibility of an object informs the level and intensity of the visual impact, but other factors also influence the nature of the visual impact. The landscape and aesthetic context of the environment in which the object is placed, as well as the perception of the viewer are also important factors. In the context of a power line, the type of tower used as well as the degree to which the towers would impinge upon or obscure a view is also a factor that will influence the experience of the visual impacts.

As described above, a power line or substation could be perceived to be highly incongruous in the context of a largely natural landscape. The height and linear nature of the power line will exacerbate this incongruity, as the towers may impinge on views within the landscape. In addition, the practice of clearing any taller vegetation from areas within the power line servitude can increase the visibility and incongruity of the power line. In a largely natural, bushier setting, vegetation clearance will cause fragmentation of the natural vegetation cover, thus making the power line more visible and drawing the viewer's attention to the power line servitude.

Sensitivity to visual impacts is typically most pronounced in areas set aside for conservation of the natural environment (such as protected natural areas or conservancies), or in areas in where the natural character or scenic beauty of the area attracts visitors (tourists). In this instance however, the area is not typically valued for its tourism significance and no formal protected areas, leisure-based tourism activities or recognised tourism routes were identified in the area.

Conversely, the presence of other anthropogenic objects associated with the built environment may "degrade" the visual environment and thus the introduction of a new power line and substation into this setting may be considered to be less of a visual impact than if there was no existing built infrastructure visible. In this context therefore, the presence of the Kappa substation and the existing high voltage power lines traversing the study area, in conjunction with the Perdekraal East WEF, is expected to lessen the visual contrast associated with the introduction of a new power line and substation.

Other factors, as listed below, can also affect the nature and intensity of a potential visual impact associated with a power line and substation:

- The location of the development in the landform setting – i.e. in a valley bottom or on a ridge top. In the latter example the development would be much more visible and would "break" the horizon;
- The presence of macro- or micro-topographical features, built form or vegetation that would screen views of the development from a receptor location;
- The presence of existing, similar features in the area and their alignment in relation to the proposed new development; and
- Temporary factors such as weather conditions (presence of haze, rainfall or heavy mist) which would affect visibility.

In this instance, the proposed power line and substations are intended to serve the proposed Oya Energy Facility and, potentially, other proposed renewable energy facilities (REFs) in the area. As such, the power line and substations will only be built if one of these energy facilities is developed. The power line and substations are therefore likely to be perceived to be part of the greater energy facility development and the visual impact will be relatively minor when compared to the visual impact associated with energy facility as a whole.

8 SENSITIVE VISUAL RECEPTORS

A sensitive visual receptor location is defined as a location from where receptors would potentially be impacted by a proposed development. Adverse impacts often arise where a new development is seen as an intrusion which alters the visual character of the area and affects the 'sense of place'. The degree of visual impact experienced will however vary from one receptor to another, as it is largely based on the viewer's perception.

A distinction must be made between a receptor location and a sensitive receptor location. A receptor location is a site from where the proposed development may be visible, but the receptor may not necessarily be adversely affected by any visual intrusion associated with the development. Less sensitive receptor locations include locations of commercial activities and certain movement corridors, such as roads that are not tourism routes. More sensitive receptor locations typically include sites that are likely to be adversely affected by the visual intrusion of the proposed development. They include tourism facilities, scenic sites and residential dwellings in natural settings.

The identification of sensitive receptors is typically based on a number of factors which include:

- the visual character of the area, especially taking into account visually scenic areas and areas of visual sensitivity;
- the presence of leisure-based (especially nature-based) tourism in an area;

- the presence of sites or routes that are valued for their scenic quality and sense of place;
- the presence of homesteads / farmsteads in a largely natural setting where the development may influence the typical character of their views; and
- feedback from interested and affected parties, as raised during the public participation process conducted as part of the BA study.

Viewing distance is also a critical factor in the experiencing of visual impacts. As the visibility of the development would diminish exponentially over distance (refer to **section 5.4** above), receptor locations which are closer to the proposed development would experience greater adverse visual impacts than those located further away.

The degree of visual impact experienced will however vary from one inhabitant to another, as it is largely based on the viewer's perception. Factors influencing the degree of visual impact experienced by the viewer include the following:

- Value placed by the viewer on the natural scenic characteristics of the area.
- The viewer's sentiments toward the proposed structures. These may be positive (a symbol of progression toward a less polluted future) or negative (foreign objects degrading the natural landscape).
- Degree to which the viewer will accept a change in the typical Karoo character of the surrounding area.

8.1 Receptor Identification

Preliminary desktop assessment of the study area identified twenty-three (23) potentially sensitive visual receptor locations within the study area, most of which appear to be existing farmsteads (**Figure 25**). These farmsteads are regarded as potentially sensitive visual receptors as they are located within a mostly rural setting and the proposed development will likely alter natural vistas experienced from these locations, although the residents' sentiments toward the proposed development are unknown.

The findings of the desktop assessment were largely confirmed by field assessments conducted in the study area for other VIAs, although it was not possible to confirm the presence of farmsteads at all the identified locations due to access restrictions. Notwithstanding this limitation, all the identified receptor locations were assessed as part of this VIA as they are still regarded as being potentially sensitive to the visual impacts associated with the proposed.

Two (2) of the identified receptor locations were confirmed to be sensitive receptors, these being tourism / accommodation facilities at the Gats Rivier Holiday Farm and Baakens Rivier. It was established that Baakens River comprises accommodation facilities that are part of the Gats Rivier Holiday Farm facility, even though these facilities are located on a different farm located some distance from the main Gats Rivier farm.

Five (5) identified receptors were found to be outside the viewshed for the combined grid infrastructure proposals.

In many cases, roads along which people travel, are regarded as sensitive receptors. The primary thoroughfare in the broader region is the R356 main road which connects the R46 near Ceres with Loxton by way of Sutherland and Fraserburg. This is a gravel road, primarily used as an access route by the local farmers and is not valued or utilised for its scenic or tourism potential. As a result, this road is not considered to be visually sensitive. In addition, the road is more than 8kms from the nearest power line route alternative and well outside the 5km visual assessment area. At this distance, motorists travelling along this road are not expected to experience any adverse visual impacts as a result of the proposed development.

The DR1475 is the primary thoroughfare in the south-western sector of the study area. This gravel road is used mainly as an access route by the local farmers and is therefore not valued or utilised for its scenic or tourism potential. As a result, this road is not considered to be visually sensitive.

Other roads in the study area are primarily farm access roads and do not form part of any scenic tourist routes and are therefore not regarded as visually sensitive.

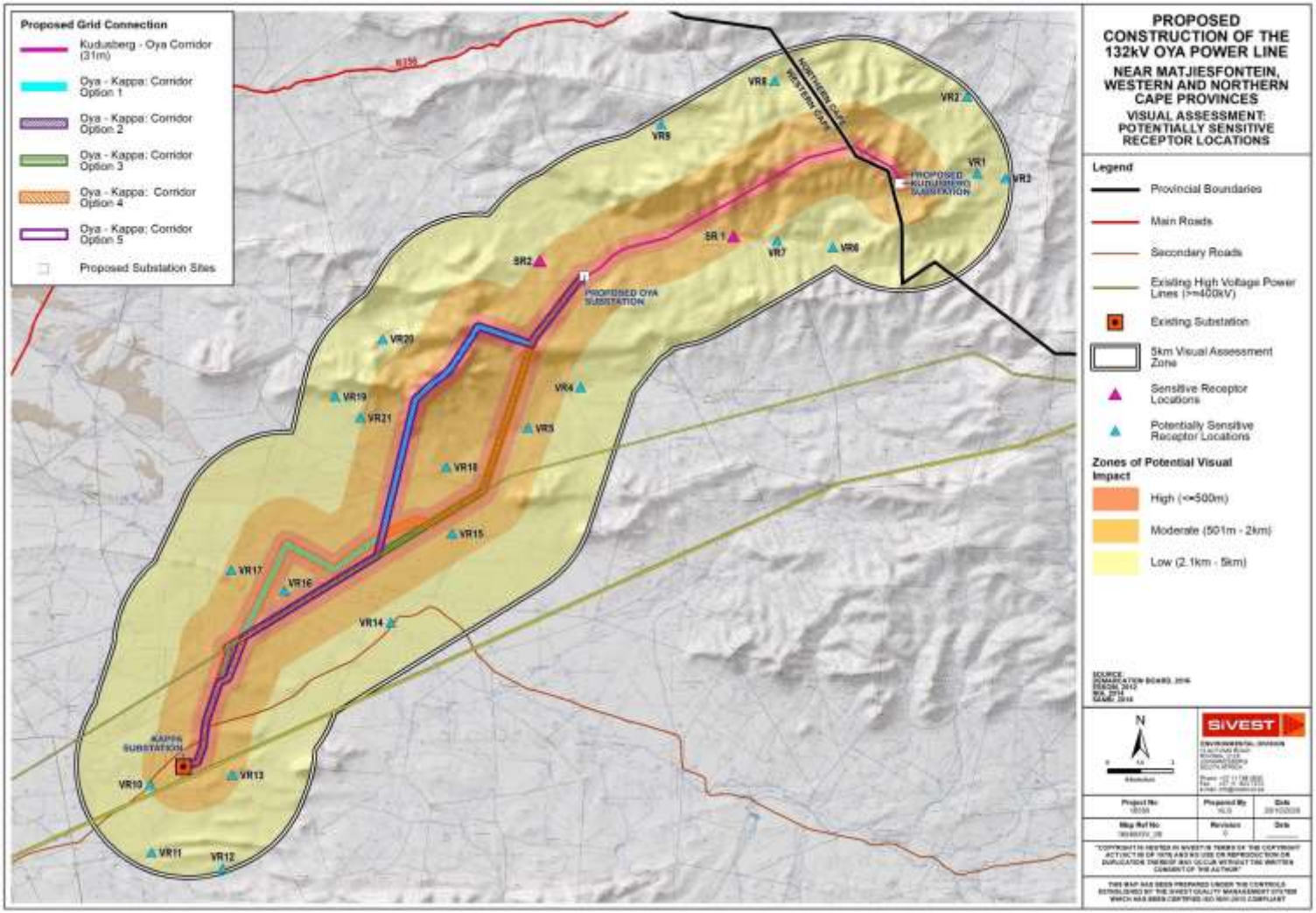

Figure 25: Potentially sensitive receptor locations within 5kms of the Oya Solar PV Facility application site.

8.2 Receptor Impact Rating

In order to assess the impact of the proposed grid infrastructure development on the identified potentially sensitive receptor locations, a matrix that takes into account a number of factors has been developed and is applied to each receptor location.

The matrix is based on a number of factors as listed below:

- Distance of a receptor location away from the proposed development (zones of visual impact)
- Presence of screening elements (topography, vegetation etc.)
- Visual contrast of the development with the landscape pattern and form

These factors are considered to be the most important factors when assessing the visual impact of a proposed development on a potentially sensitive receptor location in this context. It should be noted that this rating matrix is a relatively simplified way of assigning a likely representative visual impact, which allows a number of factors to be considered. Experiencing visual impacts is however a complex and qualitative phenomenon and is thus difficult to quantify accurately. The matrix should therefore be seen as a representation of the likely visual impact at a receptor location. Part of its limitation lies in the quantitative assessment of what is largely a qualitative or subjective impact.

As described above, the distance of the viewer / receptor location from the development is an important factor in the context of experiencing visual impacts which will have a strong bearing on mitigating the potential visual impact. A high impact rating has been assigned to receptor locations that are located within 500m of the proposed development. Beyond 5km, the visual impact of a power line and/or substation diminishes considerably, as the development would appear to merge with the elements on the horizon. Any visual receptor locations beyond this distance have therefore not been assessed as they fall outside the study area and would not be visually influenced by the proposed development.

Zones of visual impact for the proposed development were therefore delineated according to distance from the proposed power line assessment corridors. Based on the height and project, the distance intervals chosen for the zones of visual impact are as follows:

- 0 - 500m (high impact zone)
- 500m – 2km (moderate impact zone)
- 2km - 5km (low impact zone)

The presence of screening elements is an equally important factor in this context. Screening elements can be vegetation, buildings and topographic features. For example, a grove of trees or a series of low hills located between a receptor location and an object could completely shield the object from the receptor. As such, where views of the proposed development are completely screened, or where the receptor is outside the viewshed for the proposed development, the

receptor has been assigned an overriding nil impact rating, as the development would not impose any impact on the receptor.

The visual contrast of a development refers to the degree to which the development would be congruent with the surrounding environment. This is based on whether or not the development would conform to the land use, settlement density, structural scale, form and pattern of natural elements that define the structure of the surrounding landscape. Visual compatibility is an important factor to be considered when assessing the impact of the development on receptors within a specific context. A development that is incongruent with the surrounding area could have a significant visual impact on sensitive receptors as it may change the visual character of the landscape.

In light of the fact that the study area is located within the Central Strategic Transmission Corridor, and also within Renewable Energy Development Zone 2 (Komsberg REDZ[4]), the concentration of renewable energy developments and associated grid connection infrastructure is supported in this area. This could result in an incremental change in the visual character of the area and in the typical land use patterns towards a less rural environment within which power lines and substations would be less incongruous.

The matrix returns a score which in turn determines the visual impact rating assigned to each receptor location (**Table 3**) below.

Table 3: Rating scores

Rating	Overall Score
High Visual Impact	8-9
Moderate Visual Impact	5-7
Low Visual Impact	3-4
Negligible Visual Impact	(overriding factor)

An explanation of the matrix is provided in **Table 4** below.

[4] formally gazetted (Gazette Number 41445) on 16 February 2018 by the Minister of Environmental Affairs (GN 114)

Table 4: Visual assessment matrix used to rate the impact of the proposed development on potentially sensitive receptors

	VISUAL IMPACT RATING			
VISUAL FACTOR	**HIGH**	**MODERATE**	**LOW**	**OVERRIDING FACTOR: NEGLIGIBLE**
Distance of receptor away from proposed development	<= 500m **Score 3**	500m < 2km **Score 2**	2km < 5km **Score 1**	>5km
Presence of screening factors	No / almost no screening factors – development highly visible **Score 3**	Screening factors partially obscure the development **Score 2**	Screening factors obscure most of the development **Score 1**	Screening factors completely block any views towards the development, i.e. the development is not within the viewshed
Visual Contrast	**High contrast** with the pattern and form of the natural landscape elements (vegetation and land form), typical land use and/or human elements (infrastructural form) **Score 3**	**Moderate contrast** with the pattern and form of the natural landscape elements (vegetation and land form), typical land use and/or human elements (infrastructural form) **Score 2**	**Corresponds** with the pattern and form of the natural landscape elements (vegetation and land form), typical land use and/or human elements (infrastructural form) **Score 1**	

Table 5 below presents a summary of the overall visual impact of the proposed 132kV power line and substations on each of the potentially sensitive visual receptor locations identified within 5kms of the proposed development.

Table 5: Summary Receptor Impact Rating

Receptor Number	Distance to nearest Corridor Alternative		Screening	Contrast	OVERALL IMPACT RATING
SR1 – Baakens Rivier[1]	*Mod (2)*	*1.4km*	*High (3)*	*High (3)*	**HIGH (8)**
SR2 – Gats Rivier[2]	*Mod (2)*	*1.8km*	*Mod (2)*	*Mod (2)*	**MODERATE (5)**
VR 1 – Farmstead[3]	*Low (1)*	*3.4km*	***NIL***		
VR 2 – Farmstead[4]	*Low (1)*	*4.7km*	*Mod (2)*	*High (3)*	**MODERATE (6)**
VR 3 – Farmstead	Low (1)	4.7km	Mod (2)	High (3)	**MODERATE (6)**
VR 4 – Farmstead	Low (1)	2.6km	Mod (2)	High (3)	**MODERATE (6)**
VR 5 – Farmstead[6]	*Mod (2)*	*0.9km*	*Mod (2)*	*High (3)*	**MODERATE (7)**
VR 6 – Farmstead[4]	*Low (1)*	*4.2km*	*Mod (2)*	*High (3)*	**MODERATE (6)**
VR 7 – Farmstead[3]	*Low (1)*	*2.6km*	***NIL***		
VR 8 – Farmstead[4]	*Low (1)*	*3.8km*	*Mod (2)*	*High (3)*	**MODERATE (6)**
VR 9 – Farmstead[3]	*Low (1)*	*4.6km*	***Nil***		
VR 10 – Farmstead[5]	*Mod (2)*	*1.8km*	*Mod (2)*	*Mod (2)*	**MODERATE (5)**
VR 11 - Farmstead[3]	*Low (1)*	*4.2km*	***NIL***		
VR 12 - Farmstead[3]	*Low (1)*	*4.8km*	***NIL***		
VR 13 – Farmstead[5]	*Mod (2)*	*1.6km*	*Mod (2)*	*High (3)*	**MODERATE (7)**
VR 14 - Farmstead[5]	*Low (1)*	*2.8km*	*Mod (2)*	*Low (1)*	**LOW**
VR 15 - Farmstead[6]	*Mod (2)*	*0.8km*	*Mod (2)*	*High (3)*	**MODERATE (6)**
VR 16 – Farmstead[5]	*Mod (2)*	*0.7km*	*Mod (2)*	*Low (1)*	**MODERATE (5)**
VR 17 - Farmstead[5]	*Mod (2)*	*1.6km*	*Mod (2)*	*High (3)*	**MODERATE (7)**
VR 18 - Farmstead[6]	*Mod (2)*	*1.7km*	*Mod (2)*	*Mod (2)*	**MODERATE (6)**
VR 19 - Farmstead	Low (1)	3.4km	High (3)	High (3)	**MODERATE (7)**
VR 20 - Farmstead[6]	*Low (1)*	*2.8km*	*Mod (2)*	*High (3)*	**MODERATE (6)**
VR 21 - Farmstead[6]	*Low (1)*	*2.1km*	*Mod (2)*	*High (3)*	**MODERATE (6)**

[1]Baakens Rivier is located within the proposed Kudusberg WEF development area. It is known that the occupants have a vested interest in the proposed WEF and associated infrastructure development and would therefore not perceive the proposed power line in a negative light.

[2]Gats Rivier is located within the proposed Oya Energy Facility development area. It is known that the occupants have a vested interest in the proposed energy facility and associated infrastructure development and would therefore not perceive the proposed power line in a negative light.

*[3]Receptor is outside the preliminary viewshed and as such the overall impact rating is "**NIL**"*

[4]Receptor is located within the Kudusberg WEF development area. It is known that the occupants have a vested interest in the proposed WEF and associated infrastructure development and would therefore not perceive the proposed power line in a negative light.

[5]Receptor is located within the Tooverberg and Perdekraal WEF development area. It is known that the occupants have a vested interest in the proposed WEF and associated infrastructure development and would therefore not perceive the proposed power line in a negative light.

[6]Receptor is located on a property which is affected by all of the proposed power line route alignments. It is assumed that the respective land owners have consented to the proposed development on their property and do not perceive the proposed power line in a negative light.

The table above shows that one (1) of the sensitive receptors would experience high levels of visual impact as a result of the proposed development, this being the farmstead on Baakens Rivier. As previously mentioned, this property forms part of the Kudusberg WEF application site, and as such the owner has a vested interest in the development of the facility and the associated grid connection infrastructure. The other sensitive receptor, Gats Rivier Holiday Farm, will be subjected to moderate levels of visual impact, and as the property is under the same ownership as Baakens Rivier, and is part of the adjacent Oya Energy Facility project, it is unlikely that the owners will perceive the proposed development in a negative light.

Fifteen (15) potentially sensitive receptors, will be subjected to moderate levels of visual impact as a result of the proposed power line development, while one receptor will be subjected to low levels of visual impact. It should be noted however, that thirteen of these receptors are located on farms which either form part of the power line development project or are located within the development sites for other renewable energy projects. As such the owners / occupants are not expected to perceive the proposed power line and substations in a negative light.

The remaining five (5) receptors are outside the viewshed of the proposed development and are therefore not expected to be subjected to any visual impacts as a result of the power line development.

8.3 Night-time Impacts

The visual impact of lighting on the nightscape is largely dependent on the existing lighting present in the surrounding area at night. The night scene in areas where there are numerous light sources will be visually degraded by the existing light pollution and therefore additional light sources are unlikely to have a significant impact on the nightscape. In contrast, introducing new light sources into a relatively dark night sky will impact on the visual quality of the area at night. It is thus important to identify a night-time visual baseline before exploring the potential visual impact of the proposed development at night.

Much of the study area is characterised by natural areas with pastoral elements and low densities of human settlement. As a result, relatively few light sources are present in the broader area surrounding the proposed development site. The closest built-up area is the town of Touws River which is situated approximately 26km south of Kappa Substation and is thus too far away to have significant impacts on the night scene. At night, the general study area is characterised by a picturesque dark starry sky and the visual character of the night environment is largely ‘unpolluted’ and pristine. Sources of light in the area are largely limited to isolated

lighting from surrounding farmsteads and transient light from the passing cars travelling along the gravel access roads. Some light pollution is however likely to emanate from the operational and security lighting at Kappa substation and Perdekraal WEF and this would reduce the impacts of additional lighting in the area.

Power lines and associated towers or pylons are not lit up at night and, thus light spill associated with the proposed electrical infrastructure project is only likely to emanate from the proposed substations. Although the lighting required at the substation sites would normally be expected to intrude on the nightscape, night time impacts of this lighting will be reduced by the existing light spill emanating from Kappa substation and Perdekraal WEF. It should also be noted that the power line and substations will only be constructed if the proposed Oya Energy Facility (or any other proposed REF in the area) is also developed. Light sources for these facilities will include operational and security lighting and thus the lighting impacts from the proposed substations would be subsumed by the glare and contrast of the lights associated with the energy facility or REFs. As such, the substations alone are not expected to result in significant lighting impacts.

8.4 Cumulative Impacts

Although it is important to assess the potential visual impacts of the proposed power line and substations specifically, it is equally important to assess the potential cumulative visual impact that could materialise if other renewable energy facilities (both wind and solar facilities) and associated infrastructure projects are developed in the broader area. Cumulative impacts occur where existing or planned developments, in conjunction with the proposed development, result in significant incremental changes in the broader study area. In this instance, such developments would include renewable energy facilities and associated infrastructure development.

Renewable energy facilities have the potential to cause large scale visual impacts and the location of several such developments in close proximity to each other could significantly alter the sense of place and visual character in the broader region. Although power lines and substations are relatively small developments when compared to renewable energy facilities, they may still introduce a more industrial character into the landscape, thus altering the sense of place.

Fifteen (15) renewable energy projects were identified within a 35 km radius of the proposed development as shown in **Figure 26** below. These projects were identified using the DEFF's Renewable Energy EIA Application Database for SA in conjunction with information provided by Independent Power Producers (IPPs) operating in the broader region. Three (3) of these projects, namely Touws River Solar, Montagu Solar and Witberg WEF, are all located south of the N1 national route and the Bontberg mountain range. Given the visual divide provided by the mountains, it is not anticipated that these developments will result in any significant cumulative impacts affecting the landscape in the vicinity of the study area.

The remaining twelve (12) projects are listed in **Table 6** below. It is assumed that all of these renewable energy developments include grid connection infrastructure, although few details of this infrastructure were available at the time of writing this report. It should be noted that this list is based on information available at the time of writing this report and as such there may be several other renewable energy projects proposed within the study area.

The relatively large number of renewable energy facilities within the surrounding area and their potential for large-scale visual impacts could significantly alter the sense of place and visual character in the broader region, as well as exacerbate the visual impacts on surrounding visual receptors, once constructed.

Table 6: Renewable energy developments proposed within a 35km radius of the proposed 132kV Oya power line and substations

Applicant	Project	Technology	Capacity	Status of Application / Development
Oya Energy (Pty) Ltd	Oya Energy Facility	Hybrid	305MW	EIA Process underway
Brandvalley Wind Farm (Pty) Ltd	Brandvalley WEF	Wind	140MW	Approved
Biotherm Energy (Pty) Ltd	Esizayo WEF	Wind	140MW	Approved
African Clean Energy Developments Renewables	Hidden Valley (Karusa & Soetwater) WEF	Wind	140MW	Under Construction
Karreebosch Wind Farm (Pty) Ltd	Kareebosch WEF	Wind	140W	Approved
Rondekop Wind Farm (Pty) Ltd	Rondekop WEF	Wind	325MW	Approved
Kudusberg Wind Farm (Pty) Ltd	Kudusberg WEF	Wind	325W	Approved
South Africa Mainstream Renewable Power Perdekraal West (Pty) Ltd	Perdekraal West WEF & Associated Grid Connection Infrastructure	Wind	150M	Approved
South Africa Mainstream Renewable Power Perdekraal East (Pty) Ltd	Perdekraal East WEF & Associated Grid Connection Infrastructure	Wind	110MW	Operational
Rietkloof Wind Farm (Pty) Ltd	Rietkloof WEF& Associated Grid Connection Infrastructure	Wind	186MW	Approved
Roggeveld Wind Power (Pty) Ltd	Roggeveld WEF& Associated Grid Connection Infrastructure	Wind	140MW	Under Construction
ENERTRAG SA (Pty) Ltd	Tooverberg WEF & Associated Grid Connection Infrastructure	Wind	140MW	Approved

These renewable energy projects include eleven (11) WEFs and one (1) combined Solar PV and Fuel-based Generator Facility (FBGF). Although the different technologies are expected to have different impacts, all renewable energy developments and associated grid connection infrastructure are relevant as they contribute to the alteration of the visual character of the area.

Figure 26 below shows a concentration of sites proposed for WEF development to the north-east of the application site, and also to the south-west, with many of these being located outside the 5 km visual assessment zone. Given the distance from the study area and the hilly topography in the broader area, it is not anticipated that the WEF developments beyond the 5 km study area will result in any significant cumulative impacts affecting the landscape or the visual receptors within the power line visual assessment zone.

The north-eastern sector of the study area is affected by two (2) renewable energy projects, located on adjoining farm portions, namely Kudusberg WEF and Oya Energy Facility. These projects and associated infrastructure will inevitably introduce an increasingly industrial character into a largely natural, pastoral landscape in this sector of the study area, thus giving rise to significant cumulative impacts. It should be noted however that that PV panels, at an approximate height of 4m, are considerably less visible than wind turbines and as such the proposed Oya solar arrays would be outside the viewshed of many of the potentially sensitive receptor locations identified in the study area. Cumulative impacts affecting these receptors would therefore be reduced and the severity of these impacts would depend on the perceptions of the receptors.

The south- western sector of the study area is affected by three (3) WEF projects, namely Perdekraal East WEF, Perdekraal West WEF and Tooverberg WEF. These projects are all located on adjoining farm portions and are in close proximity to Kappa substation and both sets of high voltage power lines. Grid connection infrastructure for all of these projects include 132kV power lines routed along the same alignment, adjacent to the existing 765kV power lines, traversing the Tooverberg WEF application site to connect into Kappa substation. Although Perdekraal West and Tooverberg WEFs have not yet been developed, Perdekraal East WEF and the associated power line are now operational and the landscape has already undergone noticeable change, which will be exacerbated with further WEF development in the area. Impacts of this transformation will however be reduced by the fact the landscape in the vicinity of these proposed WEF developments has already been disturbed by Perdekraal East WEF, Kappa substation and the existing power lines.

An examination of the literature available for the environmental assessments undertaken for many of these renewable energy applications showed that the visual impacts identified and the recommendations and mitigation measures provided are largely consistent with those identified in this report. Where additional, relevant mitigation measures were provided in respect of the other renewable energy applications, these have been incorporated into this report where relevant.

From a visual perspective, the further concentration of renewable energy facilities with associated grid connection infrastructure as proposed will inevitably change the visual character of the area and alter the inherent sense of place, introducing an increasingly industrial character into the broader area, and resulting in significant cumulative impacts. It is however anticipated that these impacts could be mitigated to acceptable levels with the implementation of the recommendations and mitigation measures put forward by the visual specialists in their respective reports.

It is important to note however that the study area is located within the REDZ 2, known as Komsberg REDZ, and also within a Strategic Transmission Corridor and thus the relevant authorities support the concentration of renewable energy developments and associated power line infrastructure in this area. In addition, it is possible that the renewable energy facilities located in close proximity to each other could be seen as one large facility rather than separate developments. Although this will not necessarily reduce impacts on the visual character of the area, it could potentially reduce the cumulative impacts on the landscape.

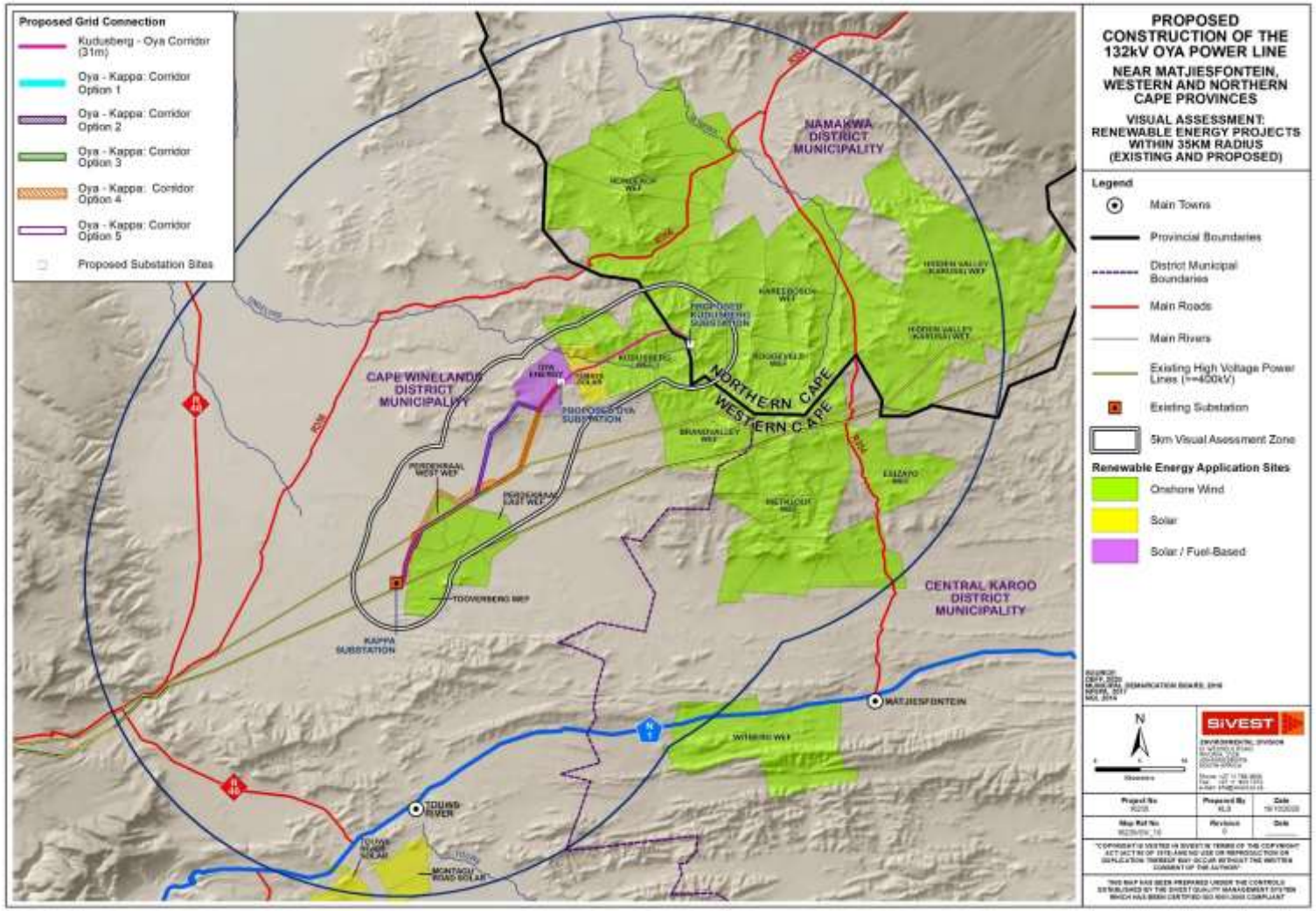

Figure 26: Renewable energy facilities proposed within a 35km radius of the 132kV Oya Power Line.

8.5 Overall Visual Impact Rating

The EIA Regulations, 2014 (as amended) require that an overall rating for visual impact be provided to allow the visual impact to be assessed alongside other environmental parameters. **Table 6 and 7** below present the impact matrix for visual impacts associated with the proposed construction and operation of the proposed 132kV power line and substations. Preliminary mitigation measures have been determined based on best practice and literature reviews.

Please refer to **Appendix D** for an explanation of the impact rating methodology.

Table 7: Impact Rating for 132kV Oya Power Line and Substations

132kV OYA POWER LINE AND SUBSTATIONS																				
ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Construction Phase (Direct Impacts)																				
▪ Potential alteration of the visual character and sense of place ▪ Potential visual impact on receptors in the study area	▪ Large construction vehicles and equipment will alter the natural character of the study area and expose visual receptors to impacts associated with construction. ▪ Construction activities may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. ▪ Dust emissions and dust plumes from increased traffic on the gravel roads serving the construction site may evoke negative sentiments from surrounding viewers. ▪ Surface disturbance during construction would expose bare soil (scarring) which could visually contrast with the surrounding environment. ▪ Temporary stockpiling of soil during construction may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.	2	3	1	2	1	2	18	-	Low	▪ Carefully plan to mimimise the construction period and avoid construction delays. ▪ Inform receptors of the construction programme and schedules. ▪ Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. ▪ Vegetation clearing should take place in a phased manner. ▪ Maintain a neat construction site by removing rubble and waste materials regularly. ▪ Make use of existing gravel access roads where possible. ▪ Limit the number of vehicles and trucks travelling to and from the construction site, where possible. ▪ Ensure that dust suppression techniques are implemented: ▪ on all access roads;	2	2	1	2	1	2	14	-	Low

											▪ in all areas where vegetation clearing has taken place; ▪ on all soil stockpiles.									
Operational Phase																				
▪ Potential alteration of the visual character and sense of place. ▪ Potential visual impact on receptors in the study area. ▪ Potential visual impact on the night time visual environment.	▪ The proposed power line and substations could alter the visual character of the surrounding area and expose sensitive visual receptor locations to visual impacts. ▪ The development may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. ▪ Dust emissions and dust plumes from maintenance vehicles accessing the site via gravel roads may evoke negative sentiments from surrounding viewers. ▪ The night time visual environment will be altered as a result of operational and security lighting at the proposed substations.	2	4	2	2	3	1	13	-	Low	▪ As far as possible, limit the number of maintenance vehicles using access roads. ▪ As far as possible, limit the amount of security and operational lighting at the proposed substations. ▪ Light fittings for security at night should reflect the light toward the ground and prevent light spill. ▪ Lighting fixtures should make use of minimum lumen or wattage. ▪ Mounting heights of lighting fixtures should be limited, or alternatively, foot-light or bollard level lights should be used. ▪ If possible, make use of motion detectors on security lighting. ▪ Buildings on the substation site should be painted with natural tones that fit with the surrounding environment. ▪ Non-reflective surfaces should be utilised where possible.	2	4	2	2	3	1	13	-	Low
Decommissioning Phase																				
▪ Potential visual intrusion resulting from vehicles and equipment involved in the decommissioning process; ▪ Potential visual impacts of increased dust emissions from decommissioning activities and related traffic; and	▪ Vehicles and equipment required for decommissioning will alter the natural character of the study area and expose visual receptors to visual impacts.	2	3	1	2	1	2	18	-	Low	▪ All infrastructure that is not required for post-decommissioning use should be removed.	2	2	1	1	1	2	14	-	Low

▪ Potential visual intrusion of any remaining infrastructure on the site.	▪ Decommissioning activities may be perceived as an unwelcome visual intrusion. ▪ Dust emissions and dust plumes from increased traffic on the gravel roads serving the decommissioning site may evoke negative sentiments from surrounding viewers. ▪ Surface disturbance during decommissioning would expose bare soil (scarring) which could visually contrast with the surrounding environment. ▪ Temporary stockpiling of soil during decommissioning may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.									▪ Carefully plan to minimize the decommissioning period and avoid delays. ▪ Maintain a neat decommissioning site by removing rubble and waste materials regularly. ▪ Ensure that dust suppression procedures are maintained on all gravel access roads throughout the decommissioning phase. ▪ All cleared areas should be rehabilitated in accordance with the recommendations of the Terrestrial Ecology assessment. ▪									
Cumulative																				
▪ Potential alteration of the visual character and sense of place in the broader area. ▪ Potential visual impact on receptors in the study area. ▪ Potential visual impact on the night time visual environment.	▪ Additional renewable energy and associated grid connection infrastructure developments in the broader area will alter the natural character of the study area towards a more industrial landscape and expose a greater number of receptors to visual impacts. ▪ Visual intrusion of multiple renewable energy developments may be exacerbated, particularly in more natural undisturbed settings. ▪ Additional renewable energy facilities in the area would generate additional traffic on gravel roads thus resulting in increased impacts from dust emissions and dust plumes. ▪ The night time visual environment could be altered as a result of operational and security lighting at multiple renewable energy facilities in the broader area.	3	3	2	3	3	2	28	-	Medium	▪ Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. ▪ Vegetation clearing should take place in a phased manner. ▪ As far as possible, limit the number of maintenance vehicles using access roads. ▪ As far as possible, limit the amount of security and operational lighting at the proposed substations. ▪ Light fittings for security at night should reflect the light toward the ground and prevent light spill. ▪ Lighting fixtures should make use of minimum lumen or wattage.	3	3	2	2	2	2	24	-	Medium

											▪ Mounting heights of lighting fixtures should be limited, or alternatively, foot-light or bollard level lights should be used. ▪ If possible, make use of motion detectors on security lighting. ▪ Buildings on the substation site should be painted with natural tones that fit with the surrounding environment. ▪ Non-reflective surfaces should be utilised where possible. ▪ Ensure that appropriate dust suppression techniques are implemented on all gravel access roads.									

Table 8: Impact Rating for 'No-Go' Alternative

NO-GO ALTERNATIVE																				
ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
▪ Potential alteration of the visual character and sense of place in the broader area. ▪ Potential visual impact on receptors in the study area. ▪ Potential visual impact on the night time visual environment.	▪ If the 132kV power line and associated substations are not developed in this area, there will be no change in the visual character or the sense of place. There will be no visual impacts on receptors or on the night-time visual environment.	NIL	NIL	NIL	NIL	NIL	NIL	NIL	-	NIL	▪ N / A	NIL	NIL	NIL	NIL	NIL	NIL	NIL	-	Low

9 COMPARATIVE ASSESSMENT OF ALTERNATIVES

As previously mentioned, only one (1) route is technically feasible for the section of the proposed power line connecting the Kudusberg on-site substation (authorised under 14/12/16/3/3/1/1976/AM1) to the Oya on-site substation (i.e. Kudusberg to Oya). Accordingly, no comparative assessment is required in respect of this route alignment.

Five (5) power line corridor route alternatives however are being assessed for the section of the proposed overhead power line which connects the Oya on-site substation to the Kappa substation (i.e. Oya to Kappa). These alternatives, as described in Section **3.2.1** and depicted in **Figure 2**, have been comparatively assessed to determine which of the alternatives would be preferred from a visual perspective.

Preference ratings for each alternative are provided in **Table 9** below. The alternatives are rated as “preferred”; “favourable”, “least-preferred” or “no-preference”. The degree of visual impact and the preference rating has been determined based on the following factors:

- The location of each proposed power line corridor route alignment alternative in relation to areas of high elevation, especially ridges, koppies or hills;
- The location of each proposed power line corridor route alternative in relation to sensitive visual receptor locations; and
- The location of each proposed power line corridor route alternative in relation to areas of natural vegetation (clearing site for the development worsens the visibility).

Key

PREFERRED	The alternative will result in a low impact / reduce the impact
FAVOURABLE	The impact will be relatively insignificant
LEAST PREFERRED	The alternative will result in a high impact / increase the impact
NO PREFERENCE	The alternative will result in equal impacts

Table 9: Comparative Assessment of Power Line Corridor Route Alternatives

Alternative	Preference	Reasons (incl. potential issues)
POWER LINE CORRIDOR ROUTE ALTERNATIVES		
Power Line Corridor Alternative 1 (Oya to Kappa) - 34.14km	Favourable	▪ Although a section of Alternative 1 is traverses ridges near the proposed Oya Substation, the visibility analysis does not indicate that these ridges are highly visible from the surrounding landscape. The remainder of this alternative is the located on relatively flat terrain and as such the power lines would only be moderately exposed on the skyline. ▪ The closest sensitive receptor to this alternative is 1.8kms away, this being SR2.

Alternative	Preference	Reasons (incl. potential issues)
		The visual impacts from Alternative 1 affecting this receptor are therefore rated as moderate. As SR2 is located on the Oya Energy Facility application site, it is assumed that the owner has a vested interest in the proposed development and thus the associated power lines would not be perceived in a negative light. ▪ Fourteen (14) potentially sensitive receptors are located within 5kms of Alternative 1, although the proposed power lines are only expected to be visible from twelve (12) of these locations. The closest potentially sensitive receptor to this alternative is approximately 672m away, this being VR16. The visual impacts from Alternative 1 affecting this receptor are therefore rated as moderate. As VR16 is located on a property which is affected by all of the proposed power line route alignments, it is assumed that the land owner has consented to the proposed development on their property and does not perceive the proposed power line in a negative light. The remaining receptors are all more than 1.5kms away and, would only be subjected to moderate or low levels of impact. ▪ Much of the southern section of this alternative is in close proximity to Kappa Substation and the associated high voltage power lines, as well as the Perdekraal East WEF. As such this section of the route alignment is already largely transformed from its natural state. This would lessen the impacts of the new power line in this area. ▪ In light of the above, there are no fatal flaws associated with Alternative 1 and this alternative is considered favourable from a visual perspective.
Power Line Corridor Alternative 2 (Oya to Kappa) - 32.43km	Favourable	▪ Although a section of Alternative 2 is traverses ridges near the proposed Oya Substation, the visibility analysis does not indicate that these ridges are highly visible from the surrounding landscape. The remainder of this alternative is the located on relatively flat terrain and as such the power lines would only be moderately exposed on the skyline. ▪ The closest sensitive receptor to this alternative is 1.8kms away, this being SR2. The visual impacts from Alternative 2 affecting this receptor are therefore rated as moderate. As SR2 is located on the Oya Energy Facility application site, it is assumed that the owner has a vested interest in the proposed development and thus the associated power lines would not be perceived in a negative light.

Alternative	Preference	Reasons (incl. potential issues)
		▪ Fourteen (14) potentially sensitive receptors are located within 5kms of Alternative 2, although the proposed power lines are only expected to be visible from twelve (12) of these locations. The closest potentially sensitive receptor to this alternative is approximately 700m away, this being VR16. The visual impacts from Alternative 2 affecting this receptor are therefore rated as moderate. As VR16 is located on a property which is affected by all of the proposed power line route alignments, it is assumed that the land owner has consented to the proposed development on their property and does not perceive the proposed power line in a negative light. The remaining receptors are all more than 1.5kms away and, would only be subjected to moderate or low levels of impact. ▪ Much of the southern section of this alternative is follows the alignment of the existing 765kW power lines and traverses an area which has already undergone significant transformation as a result of the power lines, Kappa Substation and the Perdekraal East WEF. This would lessen the impacts of the new power line in this area. ▪ In light of the above, there are no fatal flaws associated with Alternative 2 and this alternative is considered favourable from a visual perspective.
Power Line Corridor Alternative 3 (Oya to Kappa) - 30.56km	Preferred	▪ Alternative 3 largely avoids the ridge lines near the proposed Oya substation and as such, most of this route alternative is located on relatively flat terrain. As such, the power lines would only be moderately exposed on the skyline. ▪ The closest sensitive receptor to this alternative is 1.8kms away, this being SR2. The visual impacts from Alternative 3 affecting this receptor are therefore rated as moderate. As SR2 is located on the Oya Energy Facility application site, it is assumed that the owner has a vested interest in the proposed development and thus the associated power lines would not be perceived in a negative light. ▪ Eleven (11) potentially sensitive receptors are located within 5kms of Alternative 3, although the proposed power lines are only expected to be visible from nine (9) of these locations. The closest potentially sensitive receptor to this alternative is approximately 700m away, this being VR16. The visual impacts from Alternative 3 affecting this receptor are therefore rated as moderate. As VR16 is located on a property which is affected by all of

Alternative	Preference	Reasons (incl. potential issues)
		the proposed power line route alignments, it is assumed that the land owner has consented to the proposed development on their property and does not perceive the proposed power line in a negative light. The remaining receptors are all more than 780m away and, would only be subjected to moderate or low levels of impact. ▪ Much of this alternative is follows the alignment of the existing 765kW power lines and traverses an area which has already undergone significant transformation as a result of the power lines, Kappa Substation and the Perdekraal East WEF. This would lessen the impacts of the new power line in this area. ▪ In light of the above, there are no fatal flaws associated with Alternative 3. As this route is shorter than the others, and follows the alignment of the existing 765kV power lines over a significant distance and affects fewer potentially sensitive receptors, this alternative is considered preferred from a visual perspective.
Power Line Corridor Alternative 4 (Oya to Kappa) - 32.94km	Favourable	▪ Alternative 4 largely avoids the ridge lines near the proposed Oya substation and as such, most of this route alternative is located on relatively flat terrain. As such, the power lines would only be moderately exposed on the skyline. ▪ The closest sensitive receptor to this alternative is 1.8kms away, this being SR2. The visual impacts from Alternative 4 affecting this receptor are therefore rated as moderate. As SR2 is located on the Oya Energy Facility application site, it is assumed that the owner has a vested interest in the proposed development and thus the associated power lines would not be perceived in a negative light. ▪ Eleven (11) potentially sensitive receptors are located within 5kms of Alternative 4, although the proposed power lines are only expected to be visible from nine (9) of these locations. The closest potentially sensitive receptor to this alternative is approximately 672m away, this being VR16. The visual impacts from Alternative 3 affecting this receptor are therefore rated as moderate. As VR16 is located on a property which is affected by all of the proposed power line route alignments, it is assumed that the land owner has consented to the proposed development on their property and does not perceive the proposed power line in a negative light.The remaining receptors are all more than 780m away and, would only be subjected to moderate or low levels of impact.

Alternative	Preference	Reasons (incl. potential issues)
		▪ Much of this alternative is follows the alignment of the existing 765kW power lines and traverses an area which has already undergone significant transformation as a result of the power lines, Kappa Substation and the Perdekraal East WEF. This would lessen the impacts of the new power line in this area. ▪ In light of the above, there are no fatal flaws associated with Alternative 4 and this alternative is considered favourable from a visual perspective.
Power Line Corridor Alternative 5 (Oya to Kappa) – 32.26km	Favourable	▪ Although a section of Alternative 5 is traverses ridges near the proposed Oya Substation, the visibility analysis does not indicate that these ridges are highly visible from the surrounding landscape. The remainder of this alternative is the located on relatively flat terrain and as such the power lines would only be moderately exposed on the skyline. ▪ The closest sensitive receptor to this alternative is 1.8kms away, this being SR2. The visual impacts from Alternative 5 affecting this receptor are therefore rated as moderate. As SR2 is located on the Oya Energy Facility application site, it is assumed that the owner has a vested interest in the proposed development and thus the associated power lines would not be perceived in a negative light. ▪ Fourteen (4) potentially sensitive receptors are located within 5kms of Alternative 5, although the proposed power lines are only expected to be visible from twelve (12) of these locations. The closest potentially sensitive receptor to this alternative is approximately 700m away, this being VR16. The visual impacts from Alternative 5 affecting this receptor are therefore rated as moderate. As VR16 is located on a property which is affected by all of the proposed power line route alignments, it is assumed that the land owner has consented to the proposed development on their property and does not perceive the proposed power line in a negative light. The remaining receptors are all more than 1.5km away and, would only be subjected to moderate or low levels of impact. ▪ Much of the southern section of this alternative is follows the alignment of the existing 765kW power lines and traverses an area which has already undergone significant transformation as a result of the power lines, Kappa Substation and the Perdekraal East WEF. This would lessen the impacts of the new power line in this area.

Alternative	Preference	Reasons (incl. potential issues)
		▪ In light of the above, there are no fatal flaws associated with Alternative 5 and this alternative is considered favourable from a visual perspective.

9.1 No Go Alternative

The 'No Go' alternative is essentially the option of not developing power lines or substations in this area. The area would thus retain its visual character and sense of place and no visual impacts would be experienced by any locally occurring receptors.

10 CONCLUSION

A VIA has been conducted to assess the magnitude and significance of the potential visual impacts associated with the construction of a proposed 132 kV power line and associated substations to support the proposed renewable energy facilities owned by the applicant near Matjiesfontein in the Western Cape Province. Overall, sparse human habitation and the predominance of natural vegetation cover across much of the study area would give the viewer the general impression of a largely natural setting with some pastoral elements. As such, the proposed power line and substation development would alter the visual character and contrast significantly with the typical land use and/or pattern and form of human elements present across the broader study area. The level of contrast is however reduced by the presence of the Perdekraal East WEF, Kappa substation and existing high voltage power lines located in the south-western sector of the study area.

The area is not however typically valued for its tourism significance and there is limited human habitation resulting in relatively few potentially sensitive receptors in the area. A total of twenty-three (23) potentially sensitive receptors were identified in the study area, two (2) of which are considered to be sensitive receptors as they are linked to leisure/nature-based tourism activities in the area.

One of the sensitive receptors (Remainder of the Farm Baakens Rivier No 155) is expected to experience high levels of visual impact from the proposed power line development. As this receptor is located on the proposed Kudusberg WEF development site, it is believed that the owner has a vested interest in the proposed WEF development and would therefore not perceive the associated power lines and substations in a negative light. The remaining sensitive receptor, which is located on the Remainder of the Farm Gats Rivier No 156, is only expected to experience moderate impacts from the proposed development. This property is however under the same ownership as Baakens Rivier, and is part of the adjacent Oya Energy Facility project, and as such, it is unlikely that the owners will perceive the proposed development in a negative light.

Fifteen (15) potentially sensitive receptors, will be subjected to moderate levels of visual impact as a result of the proposed power line and substation development, while one (1) receptor will be subjected to low levels of visual impact. It was noted however, that thirteen of these receptors are located on farms which either form part of the power line development project or are located within the development sites for other renewable energy projects and as such the owners / occupants are not expected to perceive the proposed power line and substations in a negative light.

The remaining five (5) receptors are outside the viewshed of the proposed development and are therefore not expected to be subjected to any visual impacts as a result of the power line and substation development.

An overall impact rating was also conducted in order to allow the visual impact to be assessed alongside other environmental parameters. The assessment revealed that impacts associated with the proposed 132kV power line and associated substations will be of low significance during construction, operation and decommissioning phases with a number of mitigation measures available.

Although other renewable energy developments and infrastructure projects, either proposed or in operation, were identified within a 35km radius of the proposed development, it was determined that only five (5) of these would have any significant impact on the landscape within the visual assessment zone. These facilities are Kudusberg WEF (14/12/16/3/3/1/1976/AM1) and Oya Energy Facility (14/12/16/3/3/2/2009) in the north-eastern sector of the study area and Perdekraal East WEF, Perdekraal West WEF and Tooverberg WEF in the south-west. These facilities and the associated grid connection infrastructure will alter the inherent sense of place and introduce an increasingly industrial character into a largely natural, pastoral landscape, thus giving rise to significant cumulative impacts. It is however anticipated that these impacts could be mitigated to acceptable levels with the implementation of the recommendations and mitigation measures stipulated for each of these developments by the visual specialists. In light of this and the relatively low level of human habitation in the study area however, cumulative impacts have been rated as medium.

It is important to note that the study area is located within the REDZ 2, known as Komsberg REDZ, and also within a Strategic Transmission Corridor, and thus the relevant authorities support the concentration of renewable energy developments and associated grid connection infrastructure in this area. In addition, it is possible that the renewable energy facilities located in close proximity to each other could be seen as one large facility rather than separate developments. Although this will not necessarily reduce impacts on the visual character of the area, it could potentially reduce the cumulative impacts on the landscape.

No fatal flaws were identified for any of the proposed power line corridor alternatives (i.e. Oya to Kappa). Power Line Corridor Alternative 3 was identified as the Preferred Alternative, while Power Line Corridor Options 1, 2, 4 and 5 were found to be favourable.

10.1 Visual Impact Statement

It is SiVEST's opinion that the visual impacts associated with the proposed Oya 132kV power line and associated substations are of moderate significance. Given the low level of human habitation and the relative absence of sensitive receptors, the project is deemed acceptable from a visual impact perspective and the EA should be granted for the BA application. SiVEST is of the opinion that the visual impacts associated with the construction, operation and decommissioning phases can be mitigated to acceptable levels provided the recommended mitigation measures are implemented.

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