



CAMDEN II WIND (RF) PTY LTD

Proposed Construction of the Camden II Wind Energy Facility near Ermelo, Mpumalanga Province

Visual Impact Assessment Report – EIA Phase

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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 <i>curriculum vitae</i> ;	Section 1.2. 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 Error! Reference source not found. Appendix A
(cA) an indication of the quality and age of base data used for the specialist report;	Section Error! Reference source not found.. Section Error! Reference source not found..
(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 Error! Reference source not found..
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section Error! Reference source not found.. 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 Error! Reference source not found.. Section Error! Reference source not found..
(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 Error! Reference source not found..
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section Error! Reference source not found..
(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 Error! Reference source not found. Section Error! Reference source not found.

(k) any mitigation measures for inclusion in the EMPr;	Section Error! Reference source not found..
(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 Error! Reference source not found.
(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 12.1
(o) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	No feedback has yet been received from the public participation process regarding the visual environment
(p) any other information requested by the competent authority	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

CAMDEN II WIND (RF) PTY LTD PROPOSED CONSTRUCTION OF THE CAMDEN II WIND ENERGY FACILITY NEAR ERMELO, MPUMALANGA PROVINCE

VISUAL IMPACT ASSESSMENT REPORT – EIA PHASE

Executive Summary

Camden II Wind (RF) Pty Ltd (hereafter referred to as "CD II Wind") is proposing to construct the up to 200MW Camden II Wind Energy Facility (WEF) and associated grid connection infrastructure. The proposed WEF and grid connection projects are two of eight projects comprising the proposed Camden Renewable Energy Complex, located south-east of Ermelo in Mpumalanga Province and is within the Msukaligwa Local Municipality, in the Gert Sibande District Municipality.

The proposed WEF development will be subject to a full Environmental Impact Assessment (EIA) process in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) as amended and EIA Regulations, 2014 (as amended). Accordingly, an EIA process as contemplated in terms of the EIA Regulations (2014, as amended) is being undertaken in respect of the proposed WEF project. The competent authority for this EIA is the national Department of Forestry, Fisheries and Environment (DFFE). Grid connection infrastructure for the WEF is subject to a separate BA Process as contemplated in terms of regulation 19 and 20 of the Environmental Impact Assessment Regulations, 2014, which is currently being undertaken in parallel to the EIA process. This Visual Impact Assessment (VIA) is being undertaken as part of the EIA process.

This combined VIA has determined that the study area has a somewhat mixed visual character, transitioning from the heavily transformed urban / industrial landscape associated with Camden Power Station, Camden residential area and Mooiplaats Colliery in the north to a more rural / pastoral character across the remainder of the study area. Hence, although a WEF and power line development would alter the visual character and contrast with this rural / pastoral character, the location of the proposed WEF and grid connection infrastructure in close proximity to Camden Power Station and the associated power lines, mining activity and rail infrastructure will significantly reduce the level of contrast.

A broad-scale assessment of visual 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 to moderate** visual sensitivity. However, 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.

One formal protected area (Langcarel Private Nature Reserve) was identified within the study area, although the area is entirely managed for commercial agriculture with no conservation activities present and no evidence of public access to the site. Any landscape value or visual appeal has therefore been reduced. The area is not typically valued for its tourism significance and relatively few leisure-based tourism facilities (lodges/accommodation facilities) were identified inside the study area. This factor in conjunction with the high levels of transformation in the north have reduced the overall visual sensitivity of the broader area.

Wind Energy Facility: Receptor Identification

A total of five (5) sensitive receptors were identified in the study area, three (3) of which are considered to be sensitive receptors as they are linked to leisure/nature-based tourism facilities in the area. None of these receptors are however expected to experience high levels of visual impact from the proposed WEF facility. An additional fourteen (14) receptors were identified within 2km of the proposed WEF development, all of which appear to be farmsteads that could be regarded as potentially sensitive visual receptors as the proposed development will likely alter vistas experienced from these locations. Five (5) of these farmsteads are however located within the Camden II WEF project area and it has been confirmed by the Proponent that the relevant land owners are in support of the overall Camden Renewable Energy Complex project. As such, they are not expected to perceive the proposed development in a negative light and this would reduce the level of visual impact experienced at these locations. Two (2) potentially sensitive receptors are expected to experience high levels of visual impact as a result of the proposed development, while the remaining seven (7) will experience moderate levels of visual impact.

Two (2) sensitive receptors were identified within 5 km of the nearest grid corridor alternative, although neither of these would experience high levels of visual impact as a result of the proposed Camden II grid connection project. One of these receptors is expected to experience only moderate levels of visual impact, while the remaining receptor is expected to experience low levels of visual impact.

Electrical Grid Infrastructure: Receptor Identification

A total of thirty-three (33) *potentially* sensitive receptor locations were identified within 5 kms of the nearest corridor alternative, six (6) of which were found to be outside the viewshed for the grid connection. Of the remaining twenty-seven receptors, twenty-one (21) are expected to experience moderate levels of visual impact resulting from the grid connection infrastructure while the remaining six (6) will only experience low levels of impact. Impacts on fourteen (14) of these receptors will however be reduced due to their location within either the Camden I WEF or Camden II WEF project areas. It is known that the relevant land owners support these projects and are not expected to perceive the proposed development in a negative light.

Although the N2 receptor road traverses the study area, motorists travelling along this route are only expected to experience moderate impacts from the proposed Camden II WEF. As there are no national routes or main roads within 5 kms of the grid assessment corridors, it is not anticipated that these roads will be subjected to any visual impacts as a result of the grid connection infrastructure.

A preliminary assessment of overall impacts revealed that impacts associated with all the proposed Camden II WEF and associated grid connection infrastructure (post mitigation) are of low significance during both construction and decommissioning phases. During operation however, visual impacts (post mitigation) from the Camden II WEF would be of moderate significance with relatively few mitigation measures available to reduce the visual impact. Visual impacts associated with the Camden II WEF 132kV Grid Connection project during operation would be of low significance.

Considering the presence of existing and proposed mining activity and electrical generation and distribution infrastructure, the introduction of new renewable energy facilities in the area will result in further change in the visual character of the area and alteration of the inherent sense of place, extending 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 recommended mitigation measures. In light of this, cumulative impacts have been rated as moderate.

A comparative assessment of site alternatives for the on-site WEF infrastructure and also for the grid connection alternatives was undertaken in order to determine which of the alternatives would be preferred from a visual perspective. No fatal flaws were identified in respect of any of the alternatives for the proposed on-site substation / BESS facilities, temporary construction laydown area and temporary construction camp / cement batching plant and all alternatives were found to be favourable. No fatal flaws were identified for either of the substation alternatives or any of the grid connection infrastructure alternatives. No preference was determined for any of the grid connection alternatives and both substation site alternatives and all four Power Line Corridor Alternatives were found to be favourable.

From a visual perspective therefore, the proposed Camden II WEF and associated grid connection infrastructure projects are deemed acceptable and the respective Environmental Authorisations (EAs) 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.

CAMDEN II WIND (RF) PTY LTD

PROPOSED CONSTRUCTION OF THE CAMDEN II WIND ENERGY FACILITY NEAR ERMELO, MPUMALANGA PROVINCE

VISUAL IMPACT ASSESSMENT REPORT – EIA PHASE

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GLOSSARY OF TERMS

ABBREVIATIONS

BA	Basic Assessment
BESS	Battery Energy Storage System
DBAR	Draft Basic Assessment Report
DEIAR	Draft Environmental Impact Assessment Report
DFFE	Department of Forestry, Fisheries and Environment
DM	District Municipality
DMRE	Department of Mineral Resources and Energy
DSR	Draft Scoping Report
DTM	Digital Terrain Model
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
FEIAR	Final Environmental Impact Assessment Report
FSR	Final Scoping Report
GIS	Geographic Information System
I&AP	Interested and/or Affected Party
IPP	Independent Power Producer
LM	Local Municipality
kV	Kilovolt
MW	Megawatt
NGI	National Geo-Spatial Information
REF	Renewable Energy Facility
REIPPP	Renewable Energy Independent Power Producer Programme
SACAA	South African Civil Aviation Authority
SANBI	South African National Biodiversity Institute
SEF	Solar 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.

Sky Space: The area in which the turbine rotors would rotate.

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

Study area / Visual Assessment Zone: The area with a zone of 10km from the outer boundary of the proposed WEF application site, and 5km from the proposed grid connection corridor alternatives.

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.

CAMDEN II WIND (RF) PTY LTD PROPOSED CONSTRUCTION OF THE CAMDEN II WIND ENERGY FACILITY NEAR ERMELO, MPUMALANGA PROVINCE

VISUAL IMPACT ASSESSMENT REPORT – EIA PHASE

1 INTRODUCTION

Camden II Wind (RF) Pty Ltd (hereafter referred to as "CD II Wind") is proposing to construct the up to 200MW Camden II Wind Energy Facility (WEF) and associated grid connection infrastructure near Ermelo in Mpumalanga Province. The proposed WEF and grid connection projects are two of eight projects comprising the proposed Camden Renewable Energy Complex. The proposed WEF development will be subject to a full Environmental Impact Assessment (EIA) process in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) as amended and EIA Regulations, 2014 (as amended). Accordingly, an EIA process as contemplated in terms of the EIA Regulations (2014, as amended) is being undertaken in respect of the proposed WEF project. The competent authority for this EIA is the national Department of Forestry, Fisheries and Environment (DFFE).

Grid connection infrastructure for the WEF is subject to a separate BA Process as contemplated in terms of regulation 19 and 20 of the Environmental Impact Assessment Regulations, 2014, which is currently being undertaken in parallel to the EIA process.

Specialist studies have been commissioned to assess and verify the proposed development under the new Gazetted specialist protocols¹.

1.1 Scope and Objectives

This combined Visual Impact Assessment (VIA) is being undertaken as part of the respective EIA and BA processes relating to the Wind Energy Facility and electrical grid infrastructure respectively. The aim of the VIA is to identify potential visual issues associated with the development of the proposed WEF and associated infrastructure, as well as to determine the potential extent of visual impacts. This will be achieved by determining the character of the visual environment and identifying areas of potential visual sensitivity that may be subject to visual impacts. The visual assessment focuses on the potentially sensitive visual receptor locations and provides an assessment of the magnitude and significance of the visual impacts associated with the WEF and the associated infrastructure.

¹ Formally gazetted on 20 March 2020 (GN No. 320)

1.2 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 and spatial analysis skills have been extensively utilised in projects throughout South Africa and in other Southern African countries. Kerry has also undertaken many VIAs in recent years and the relevant VIA project experience is listed in the table below.

A Curriculum Vitae and a signed specialist statement of independence are included in Appendix- A of this specialist assessment.

Table 1: Relevant Project Experience

Environmental Practitioner	Kerry Schwartz (for and on behalf of SiVEST SA)
Contact Details	klschwartz@slrconsulting.com
Qualifications	BA (Geography), University of Leeds 1982
Expertise to carry out the Visual Impact Assessment.	<p>Visual Impact Assessments:</p> <ul style="list-style-type: none"> ▪ VIA (EIA) for the proposed Oya Energy Facility near Matjiesfontein, Western Cape Province; ▪ VIA (BA) for the proposed construction of 132kV power lines to serve the authorised Loeriesfontein 3 PV Solar Energy Facility near Loeriesfontein, Northern Cape Province; ▪ VIA (BA) for the proposed construction of the Oya 132kV power line near Matjiesfontein, Northern and Western Cape Provinces; ▪ VIAs (EIA) for the proposed Koup 1 and Koup 2 WEFs, near Beaufort West, Western Cape Province; ▪ 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 Noupoot 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.

	<ul style="list-style-type: none"> ▪ 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 Noupoot, Northern Cape Province. ▪ VIA (Scoping and Impact Phase) for the proposed development of the San Kraal Wind Energy Facility near Noupoot, 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)
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1.3 Assessment Methodology

This VIA is based on a combination of desktop-level assessment supported by field-based observation.

1.3.1 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 – 2020). The characteristics identified via desktop means were later verified during the site visit.

1.3.2 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 identified and assessed in order to determine the impact of the proposed development on these receptor locations.

1.3.3 Fieldwork and photographic review

A two (2) day site visit was undertaken between the 17th and the 18th of September 2019 (late winter). The purpose of the site visit 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).

1.3.4 Visual / Landscape Sensitivity

GIS technology was used to identify any specific areas of potential visual sensitivity within the Camden II WEF development site and also within the power line assessment corridors. These would be areas where the placement of wind turbines or the establishment of a new power line will result in the greatest probability of visual impacts on potentially sensitive visual receptors.

In addition, the National Environmental Screening Tool² was examined to determine any relative landscape and flicker sensitivity in respect of the proposed development.

1.3.5 Impact Assessment

A rating matrix was used to provide an objective evaluation of the significance of the visual impacts associated with the proposed development, both before and after implementing mitigation measures. Mitigation measures were identified (where possible) in an attempt to minimise the visual impact of the proposed development. The rating matrix considers a number of different factors including geographical extent, probability, reversibility, irreplaceable loss of

² <https://screening.environment.gov.za/screeningtool/>

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.

Potential visual impacts associated with the overall development were identified and preliminary mitigation measures were recommended (where possible) in an attempt to minimise the visual impact of the proposed development. These impacts will be rated during the EIA phase of the project in line with the impact rating matrix provided by the Environmental Assessment Practitioner (EAP).

1.3.6 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, feedback received during the EIA phase will be addressed in later updates of this report.

1.4 Sources of Information

The main sources of information utilised for this VIA included:

- Project description for the proposed development provided by the Proponent;
- 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 2020 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 2021;
- South African Renewable Energy EIA Application Database from DFFE (incremental release Quarter 3 2021);
- South African Protected Areas Database from DFFE (incremental release Quarter 2 2021);
- The National Web-Based Environmental Screening Tool, Department of Forestry, Fisheries and Environment (DFFE).

2 ASSUMPUMPTIONS AND LIMITATIONS

- Wind turbines are very large structures and could impact on visual receptors that are located relatively far away, particularly in areas where the terrain is very flat. Given the nature of the receiving environment and the height of the proposed wind turbines, the study area or visual assessment zone is assumed to encompass an area of 10km from the proposed WEF – i.e. an area of 10km from the boundary of the WEF application site. The application of the 10km limit on the visual assessment zone relates to the fact that visual impacts decrease exponentially over distance. Thus although the WEF may still be visible beyond 10km, the degree of visual impact would diminish considerably. As such, the need to assess the impact on potential receptors beyond this distance would not be warranted.
- In assessing the potential visual impacts of the proposed 132kV power line, the visual assessment zone is assumed to encompass a zone of 5km from the outer boundary of the power line assessment corridors.
- The identification of visual receptors involved a combination of desktop assessment as well as field-based observation. Initially Google Earth imagery was used to identify potential receptors within the study area. Where possible, these receptor locations were verified and assessed during a site visit which was undertaken in mid-September 2019. Due to the extent of the study area however and the number of receptors that could potentially be sensitive to the proposed development, it was not possible to visit or verify every potentially sensitive visual receptor location. As such, a number of 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.
- The potential visual impact at each sensitive 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 an 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.
- As stated, the exact status of all the receptors could not be verified during the field investigation and as such the receptor impact rating was largely undertaken via desktop

means. Where details of the levels of leisure / tourism activities on different sectors of the relevant farms are not known, the impact rating matrix for these receptors is based on the assumed location of the main accommodation complex on each property.

- Where receptors have been identified within the WEF project area, it has been confirmed that the land owners or residents at these locations support the proposed WEF development and would not view the project in a negative light.
- Based on the project description provided by the Proponent, all analysis for this VIA is based on a worst-case scenario where turbine heights are assumed to be 300 m at the blade tip. On-site substations, Battery Energy Storage (BESS) facilities and office building heights are assumed to be less than 25m in height.
- Visual analysis in respect of the power lines is based on a worst-case scenario where power line tower heights are assumed to be 40 m.
- Due to the varying scales and sources of information; maps may have minor inaccuracies. Terrain data for this area, derived from the National Geo-Spatial Information (NGI)'s 25m Digital Elevation Model (DEM), is fairly coarse and somewhat inconsistent and as such, localised topographic variations in the landscape may not be reflected on the DEM used to generate the viewshed(s) and visibility analysis conducted in respect of the proposed development.
- In addition, the viewshed / visibility analysis does not take into account any existing vegetation cover or built infrastructure which may screen views of the proposed development. This analysis should therefore be seen as a conceptual representation or a worst-case scenario.
- 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 EIA Report (DEIR) or Draft Basic Assessment Report (DBAR) will however be incorporated into further drafts of this report, if relevant.
- At the time of undertaking the visual study no information was available regarding the type and intensity of lighting that will be required for the proposed WEF and therefore the potential impact of lighting at night has not been assessed at a detailed level. However, lighting requirements are relatively similar for all WEFs and as such, general measures to mitigate the impact of additional light sources on the ambiance of the nightscape have been provided.
- At the time of undertaking the visual study no *detailed* information was available regarding the design and layout of services and infrastructure associated with the proposed development. The potential visual impact of the *typical* infrastructure associated with a wind farm has therefore been assessed.
- In the light of the fact that the renewable energy industry is still relatively new in South Africa, this report draws on international literature and web material to describe the generic impacts associated with WEFs.
- Photomontages have not been compiled for all sensitive and potentially sensitive receptor locations. Instead, a range of locations was selected for modelling purposes

to provide an indication of the possible impacts from different locations within the study area. It should be noted that these photomontages are specific to the location, and that even sites in close proximity to one another may be affected in different ways by the proposed WEF development. The visual models represent a visual environment that assumes that all vegetation cleared during construction will be restored to its current state after the construction phase. This is however an improbable scenario as some vegetation cover may be permanently removed which may reduce the accuracy of the models generated.

- At the request of the Proponent, photomontages were compiled for this WEF in October 2019 at which time, the proposed project was still in the planning phase. As such, the photomontages are based on a turbine layout which has since changed. Accordingly, the photomontages presented in this report should be seen merely as indicative illustrations and not as an accurate representation of the proposed Camden II WEF turbine layouts.
- Although the grid connection and on-site infrastructure associated with the WEF has not been included in the models, this is not considered to be a limitation as the visual impact of associated infrastructure would be minor when considering the scale of these infrastructural elements in relation to wind turbines.
- This study includes an assessment of the potential cumulative impacts of other renewable energy and infrastructural / mining 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.
- It should be noted that the fieldwork for this study was undertaken in mid-September 2019, during late winter which is characterised by low levels of rainfall and reduced vegetation cover. In these conditions, increased levels of visual impact will be experienced from receptor locations in the surrounding area.
- The overall weather conditions in the study area have certain visual implications and are expected to affect the visual impact of the proposed development to some degree. In clear weather conditions, the wind turbines would present a greater contrast with the surrounding environment than they would on an overcast day. Although the field investigation was conducted during clear weather conditions however, localised pollution in the study area results in relatively hazy skies which would reduce the visibility of the turbines.

3 TECHNICAL DESCRIPTION

3.1 Project Location

3.1.1 WEF

The proposed WEF is located approximately 22km south-east of Ermelo in Mpumalanga Province (**Figure 1**) and is within the Msukaligwa and Dr Pixley Ka Isaka Seme Local Municipalities, in the Gert Sibande District Municipality.

Based on the current conceptual layout, the WEF project area as shown on the locality map below (**Figure 2**) is approximately 4 300 hectares (ha) in extent and incorporates the following farm portions:

- Adrianople 296 IT (Portion 0, 1, 2 and 3)
- Buhrmansvallei 297 IT (Portion 3, 4 and 5)
- Klipfontein 326 IT (Portion 5)
- De Emigratie 327 IT (Portion 3 and 6)

A smaller buildable area (~200 ha) subject to finalisation based on technical and environmental requirements, has however been identified as a result of a preliminary suitability assessment undertaken by the Proponent and this area is likely to be further refined with the exclusion of sensitive areas determined through various specialist studies being conducted as part of the EIA process.

3.1.2 Grid Connection

It is proposed that a 132kV overhead power line will connect the Camden II WEF on-site substation to Camden Power Station via the proposed Camden Collector substation (which in turn will connect to the Camden Power Station).

Based on the current proposed power line route alignment, the grid assessment corridors will traverse the following farm portions:

- Adrianople 296 IT (Portion 0, 1, 2 and 3)
- Klipbank 295 IT (Portion 0 and 3)
- Welgelegen 322 IT (Portion 1 and 2)

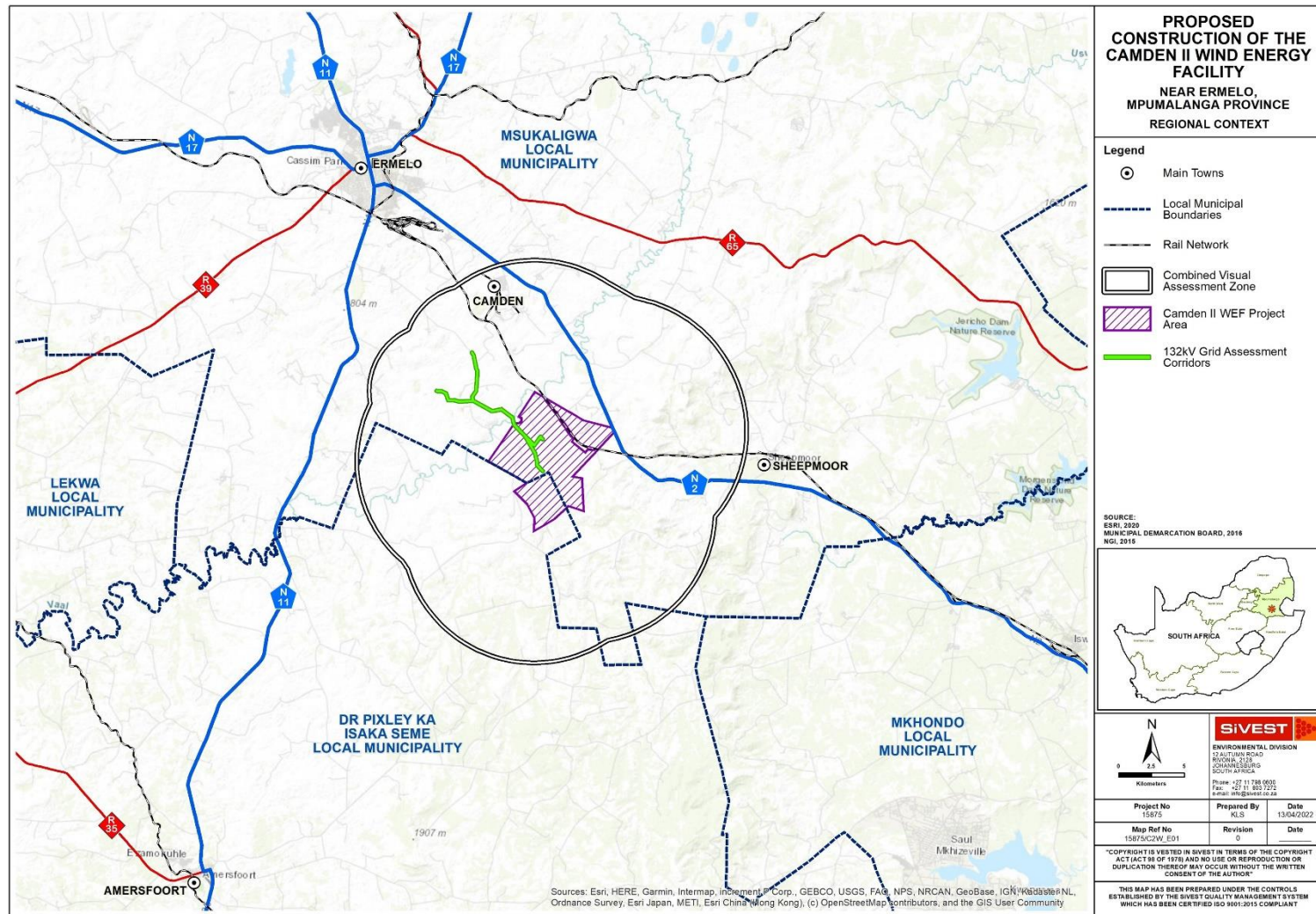


Figure 1: Camden II WEF in the Regional Context

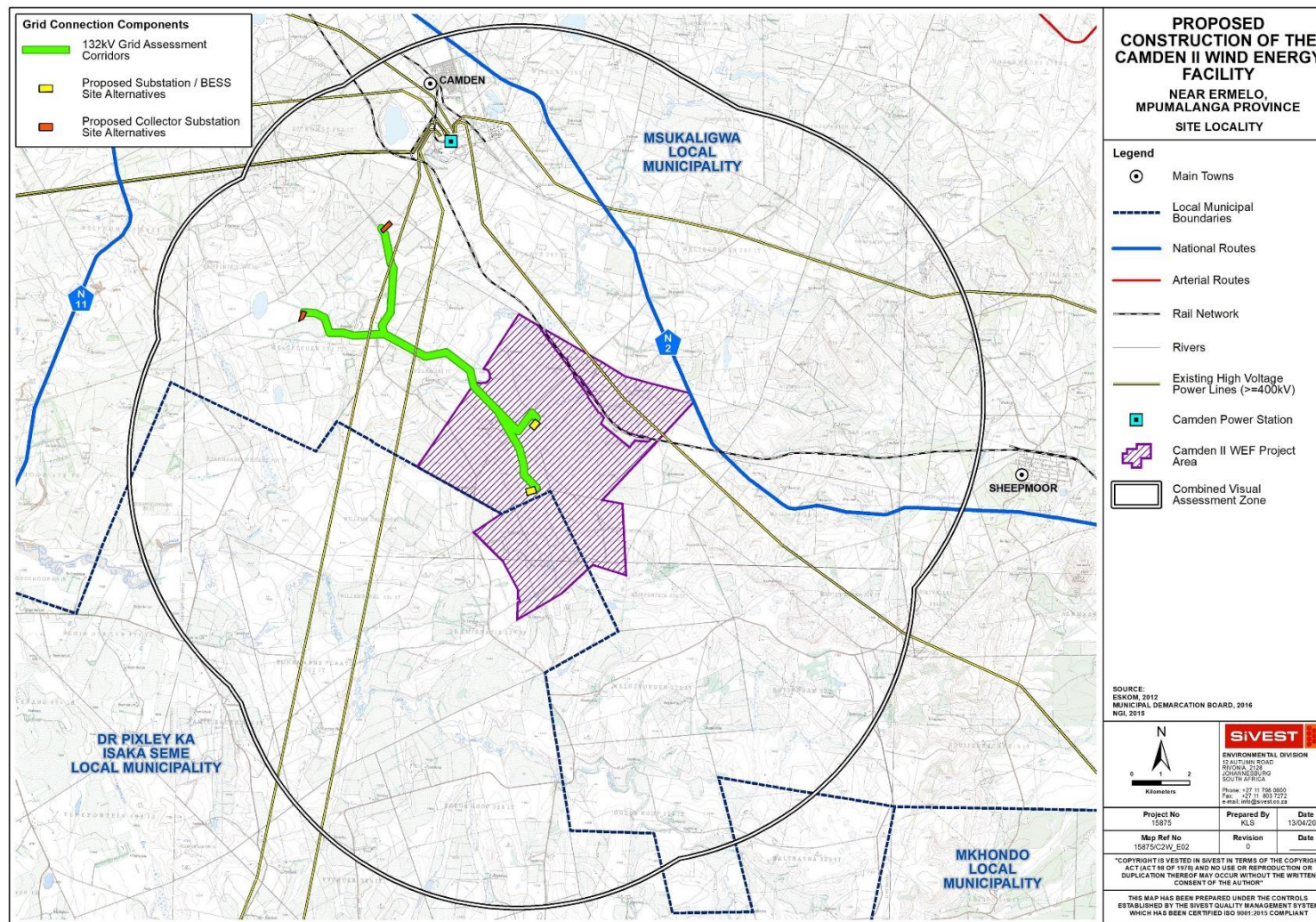


Figure 2: Camden II WEF Site Locality

3.2 Project Technical Details

3.2.1 Wind Farm Components

It is anticipated that the proposed Camden II WEF will comprise up to fifty (45) wind turbines with a maximum total energy generation capacity of up to 200MW. The electricity generated by the proposed WEF development will be fed into the national grid by way of a 132kV overhead power line (OHP) connecting to the nearby Camden I Collector Substation, which in turn will connect to the Eskom Camden Power Station. The 132kV OHP will however require a separate EA and is subject to a separate BA process, which is currently being undertaken in parallel to the EIA process. In summary, the proposed Camden II WEF will include the following components:

- Up to 45 wind turbines, with a total capacity of up to 200MW.
- Each wind turbine will have a hub height and rotor diameter of up to approximately 200m (**Figure 3**);
- Permanent compacted hardstanding areas / platforms (also known as crane pads) of approximately 25m² per turbine during construction and for on-going maintenance purposes for the lifetime of the proposed development;
- Each wind turbine will require concrete foundations with a diameter of approximately 25m and will be up to approximately 4.5m in depth depending on the geotechnical conditions.
- One (1) new Independent Power Producer (IPP) on-site substation, occupying an area of approximately 6.5 ha. The proposed substation will consist of a high voltage substation yard to allow for multiple (up to) 132kV feeder bays and transformers, control building, telecommunication infrastructure, access roads, etc.
- A Battery Energy Storage System (BESS) will be located next to the onsite substation. The BESS storage capacity will be up to 200MW/800MWh with up to four hours of storage. It is proposed that Lithium Battery Technologies, such as Lithium Iron Phosphate, Lithium Nickel Manganese Cobalt oxides or Vanadium Redox flow technologies will be considered as the preferred battery technology. The main components of the BESS include the batteries, power conversion system and transformer which will all be stored in various rows of containers;
- The wind turbines will be connected to the proposed substation via medium voltage (up to 33kV) cables. Cables will be installed underground, except where a technical assessment suggests that overhead lines are required.
- Internal roads with a width of between 5m and 6m, will provide access to each wind turbine. Where required for turning circle/bypass areas, access or internal roads may be up to 20m to allow for larger component transport. The total length of internal road envisaged is 60km.
- One (1) temporary laydown / staging area of between 22 000m² and 30 000m².
- Operation and Maintenance (O&M) buildings, with a combined footprint of approximately 500m² to be located in close proximity to the substation site.
- A temporary cement batching plant occupying a footprint of approximately 0.5 ha. The site will also accommodate a cement silo of up to 20m in height.

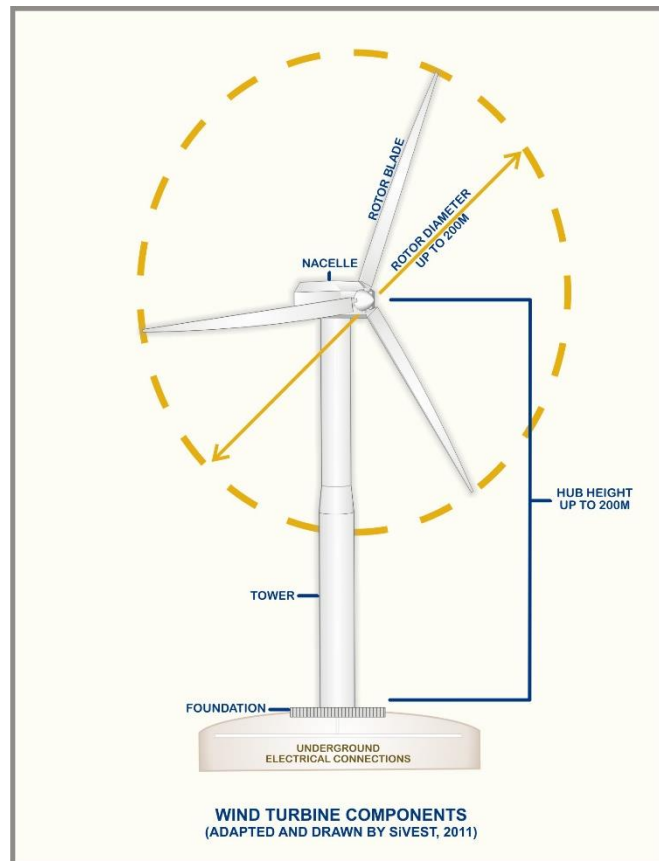


Figure 3: Typical components of a wind turbine

3.2.2 Grid Connection Infrastructure

The electricity generated by the proposed Camden II WEF will be fed into the national grid by way of (up to 132kV) overhead power lines (OHPs) of either single or double circuit, connecting to the nearby Camden Power Station. The OHL towers will be up to 35 m in height and it is assumed that these towers will be located approximately 200m to 250m apart.

Power line corridors of 250 m are being assessed to allow flexibility when determining the final route alignment. The required servitude width is however much less than 250m and will be positioned within the assessed corridor.

The proposed grid connection infrastructure to serve the Camden II WEF will include the following components:

- One (1) new 33/132kV on-site substation, occupying an area of up to approximately 1.5 ha in extent. The onsite grid connection substation will consist of a high voltage substation yard to allow for multiple (up to) 132kV feeder bays and transformers, control building, telecommunication infrastructure, access roads, etc. The proposed substation will be a step-up substation and will include an Eskom portion and an IPP portion, hence the substation has been included in both the EIA for the WEF and in the BA for the grid infrastructure to allow for handover to Eskom. The applicant will remain in control of the low voltage components (i.e. 33kV components) of the substation, while the high voltage

components (i.e. 132kV components) of this substation will likely be ceded to Eskom shortly after the completion of construction; and

- New 132kV overhead power lines, either single or double circuit, connecting the on-site substation to the nearby proposed Camden Collector substation, which in turn will connect to the Camden Power Station.

3.2.3 EIA Layout Alternatives

Design and layout alternatives for the proposed WEF are being considered and assessed as part of the EIA. These include two site alternatives for the Substation / BESS, three site alternatives for the construction camp and four site alternatives for the temporary laydown area (**Figure 4**).

3.2.4 BA Alternatives

Two substation alternatives with four associated route alternatives are being assessed for the proposed Camden II 132kV WEF grid connection (**Figure 5**).

- Power Line Corridor Option 1 is approximately 11 km in length (depending on the exact route options), linking substation Option 2 to Camden Collector Substation Option 2.
- Power Line Corridor Option 2 is approximately 10 km in length (depending on the exact route options), linking substation Option 2 to Camden Collector Substation Option 1.
- Power Line Corridor Option 3 is approximately 12 km in length (depending on the exact route options), linking substation Option 1 to Camden Collector Substation Option 2.
- Power Line Corridor Option 4 is approximately 11 km in length (depending on the exact route options), linking substation Option 1 to Camden Collector Substation Option 1.

All four route alternatives are within the Camden I WEF and Camden II WEF project areas.

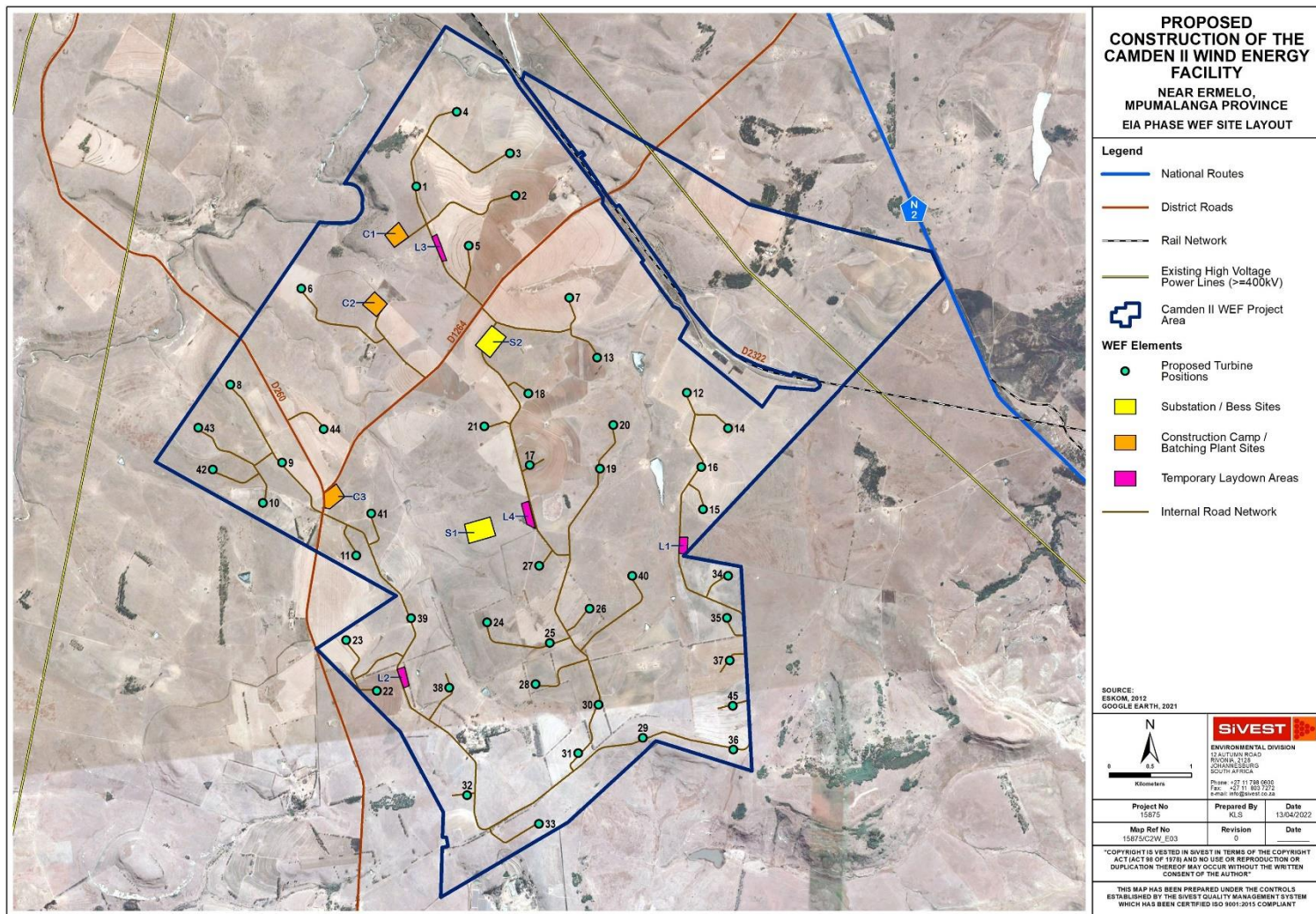


Figure 4: Preliminary Camden II WEF layout (turbine numbering indicative only)

CAMDEN II WIND (RF) PTY LTD

Proposed Camden II Wind Energy Facility - EIA Visual Impact Assessment Report

Version No.1

3 August 2022

prepared by: **SiVEST**

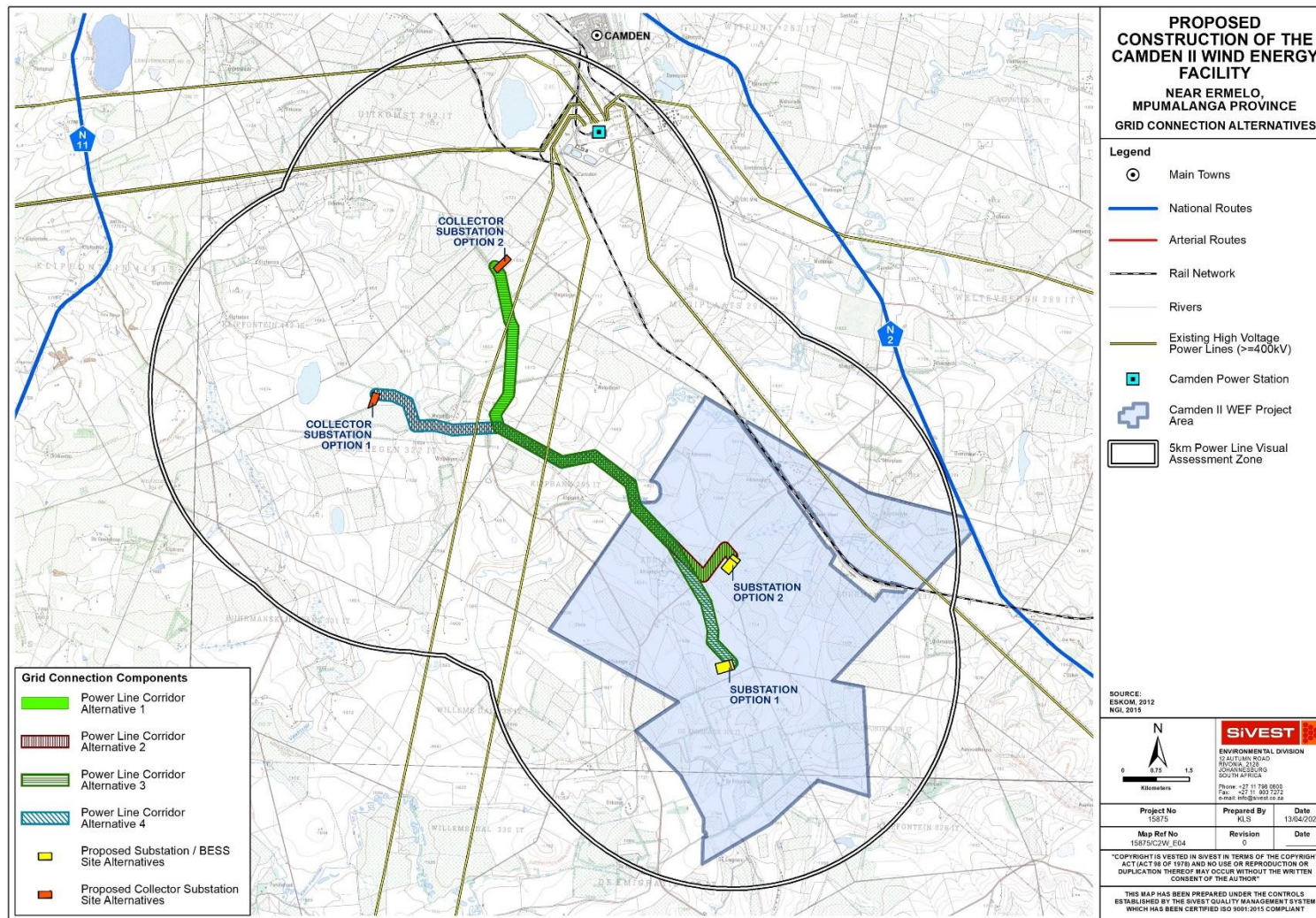


Figure 5: Grid Connection Alternatives

4 LEGAL REQUIREMENTS AND GUIDELINES

Key legal requirements pertaining to the proposed WEF development are outlined below.

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), (NEMA) and the EIA Regulations 2014 (as amended), the proposed development includes listed activities which require a full Environmental Impact Assessment (EIA) or a Basic Assessment (BA) to be undertaken. As part of the EIA and BA processes, the need for a VIA to be undertaken has been identified in order to assess the visual impact of the proposed WEF and grid connection infrastructure.

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

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

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.

Accordingly, this specialist visual assessment has been undertaken in compliance with Appendix 6 of 2014 NEMA EIA Regulations (as amended).

5 FACTORS INFLUENCING VISUAL IMPACT

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

5.1 Visual environment

WEF facilities and associated electrical infrastructure are not features of the natural environment, but are rather a representation of human (anthropogenic) alteration. As such, these developments are likely to be perceived as visually intrusive when placed in largely undeveloped landscapes that have a natural scenic quality and where tourism activities are practised that are dependent on the enjoyment of, or exposure to, the scenic or aesthetic character of the area. Residents and visitors to these areas could perceive the development to be highly incongruous in this context and may regard the development as an unwelcome intrusion which degrades the natural character and scenic beauty of the area, and which could potentially even compromise the practising of tourism activities in the area. In this instance

however, significant transformation in parts of the study area has resulted in considerable degradation of the scenic quality of the landscape

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 WEF and associated grid connection infrastructure into this setting may be considered to be less visually intrusive than if there was no existing built infrastructure visible.

5.2 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. The viewer's perception 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 a WEF and the associated grid connection infrastructure to be a negative visual impact as this type of development is often associated with employment creation, social up-liftment and the general growth and progression of an area, and could even have positive connotations.

5.3 Type of visual receptor

Visual impacts can be experienced by different types of receptors, including people living or 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 place 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 6**).

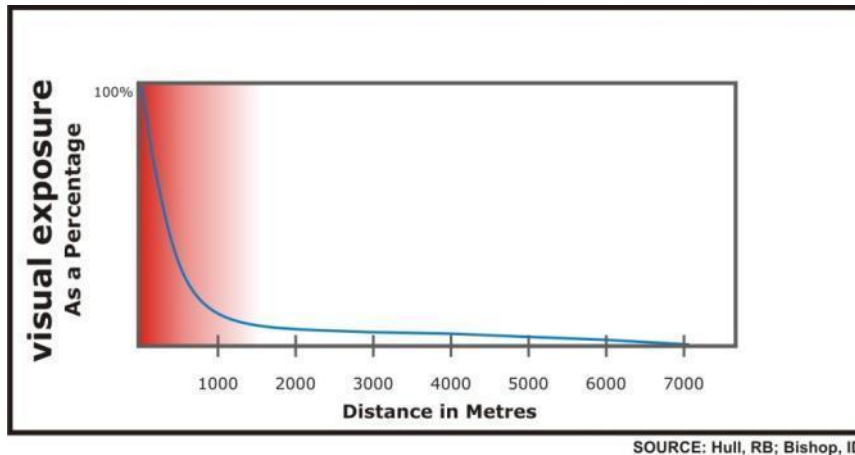


Figure 6: Conceptual representation of diminishing visual exposure over distance

Visual impacts resulting from wind turbines would be greatest within a 1km to 2km radius, and although turbines may still be visible beyond 10km, the degree of visual impact would diminish considerably at this distance (**Figure 7**).

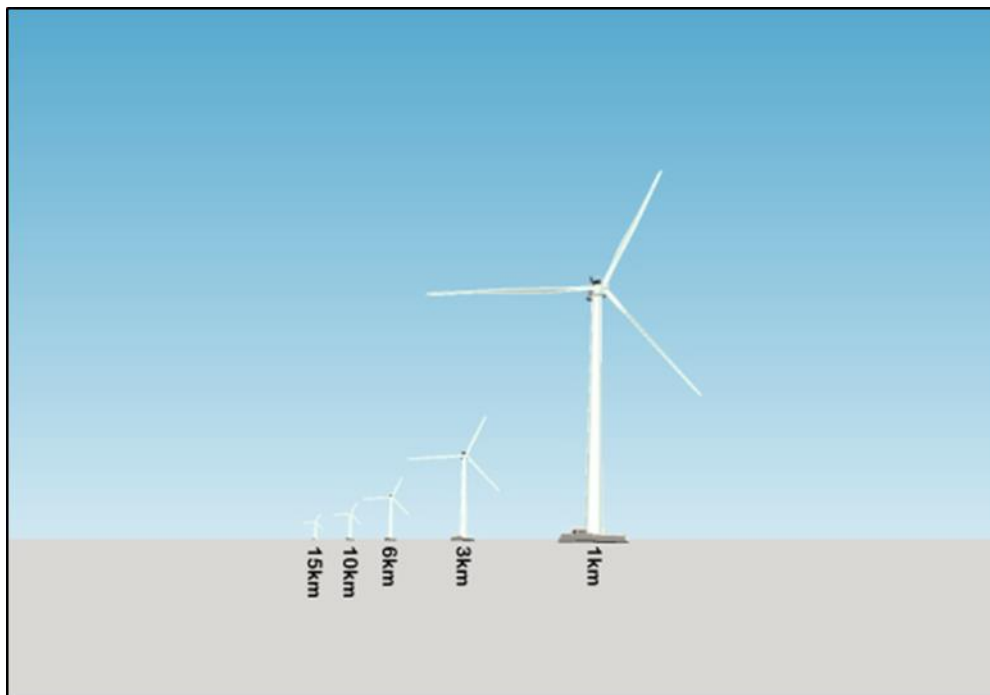


Figure 7: Conceptual representation of the diminishing visibility of a wind turbine over distance.

6 VISUAL CHARACTER AND SENSITIVITY OF THE STUDY AREA

Defining the visual character of an area is an important part of assessing visual impacts as this 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 site proposed for the Camden II WEF development and associated grid connection infrastructure is located in an area largely characterised by a mix of undulating plains (**Figure 8**) and greater relief in the form of higher lying plateaus intersected by river valleys ((**Figure 9**). Slopes across the study area are relatively gentle to moderate, with steeper slopes being largely associated with eastern edge of the study area where the land drops quite steeply to the lower plains. The main water course in the study area is the Vaal River which bisects the study area to the north of the Camden II project area.

The Camden II project area is largely characterised by gently undulating terrain, although a distinctive low ridge runs through the middle of the site in a north-south direction (**Figure 10**).

Maps showing the topography and slopes within and in the immediate vicinity of the combined assessment area are provided in **Figure 11** and **Figure 12**.



Figure 8: View from the north-western edge of the study area showing undulating terrain to the south-east.



Figure 9: Areas of greater relief to the south of the Camden II WEF project area.



Figure 10: View of east from District Road D260 across the Camden II WEF project site showing a low ridge dominating the site.

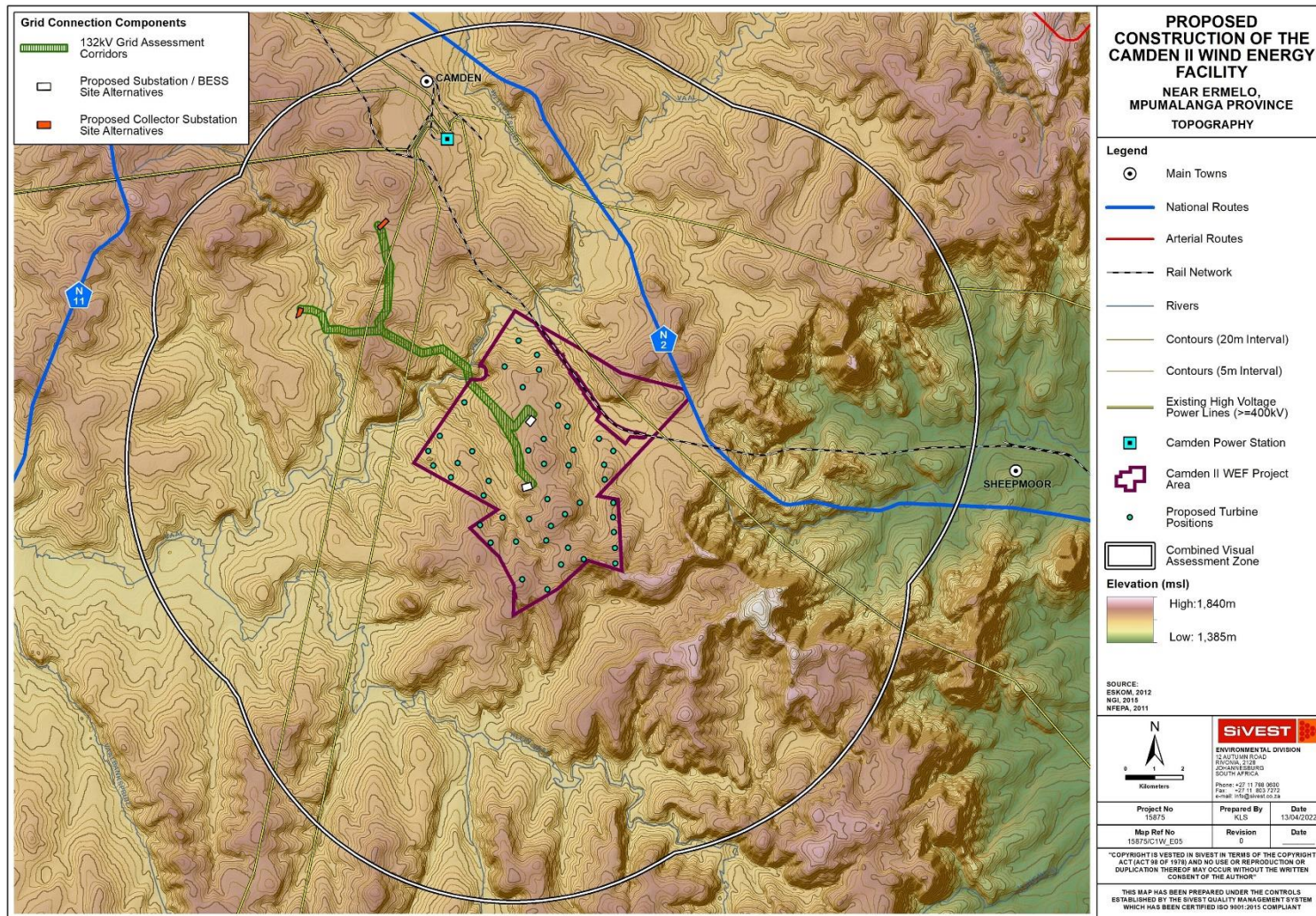


Figure 11: Topography of the study area

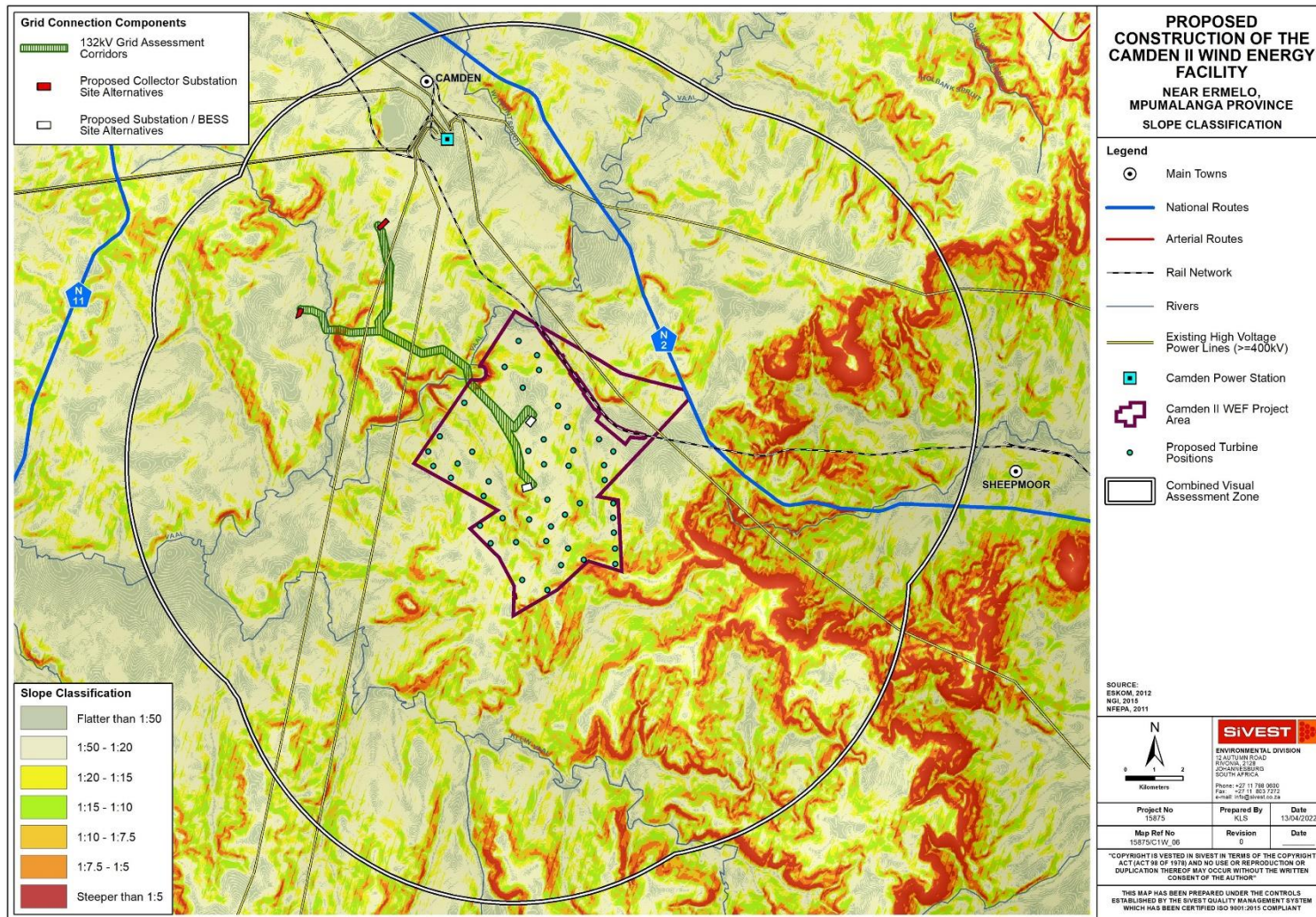


Figure 12: Slope classification

Visual Implications

The nature of the topography and the position of the viewer within the landscape are strong factors influencing the types of vistas typically present. Wider vistas will typically be experienced from higher-lying areas or hilltops and as such the viewshed will be directly dependent on whether the viewer is within a valley bottom or in an area of higher elevation. 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 wind turbines are very large structures (potentially up to 300m in height including the rotor blades), these could be visible from a considerable area around the site. Although localised topographic variations may limit views of wind turbines from some parts of the study area, across the remainder of the study area there would be very little topographic shielding to lessen the visual impact of the turbines from the receptor locations.

The high degree of visibility was confirmed by way of a preliminary visibility analysis for the proposed turbine positions as provided by the Proponent. A worst-case scenario was assumed when undertaking the analysis, in which the proposed turbines were assigned a maximum height of 300 m (**maximum height at blade tip**). The resulting viewshed, as shown in **Figure 13**, indicates that the blade tips of wind turbines positioned on the application site would be visible from most parts of the study area, although significant areas on the lower plains to the east would be outside the viewshed. It should be noted, that in some instances, *only* the blade tips or the upper-most sections of the turbines may be visible from certain areas inside the viewshed because views of the lower portions of the turbine could possibly be screened by topographic elements and / or vegetation cover. Visual impacts in these instances would thus be significantly reduced.

Although the power line towers and the steel structures of the proposed substation are much smaller than wind turbines, at a maximum height of 35m, they are still likely to be visible from many of the locally-occurring receptor locations. In addition, sections of the proposed power line could impact on the skyline, particularly where they traverse ridges or areas of relatively higher elevation. A preliminary visibility analysis was undertaken for the proposed power line routes and substation sites, based on points at 250 m intervals along the centre line of the corridor alternatives, and assuming a tower height of 35 m. The resulting viewshed as per **Figure 14** below indicates that elements of the proposed grid connection infrastructure would be highly visible from several areas, mostly within 2 km of the assessment corridors. Beyond this distance however, visibility is significantly reduced and many areas are outside the viewshed for the power lines.

However, the visibility analysis is based entirely on topography and does not consider any existing vegetation cover or built infrastructure which may screen views of the proposed development. Detailed topographic data was not available for the broader study area and as such the visibility 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.

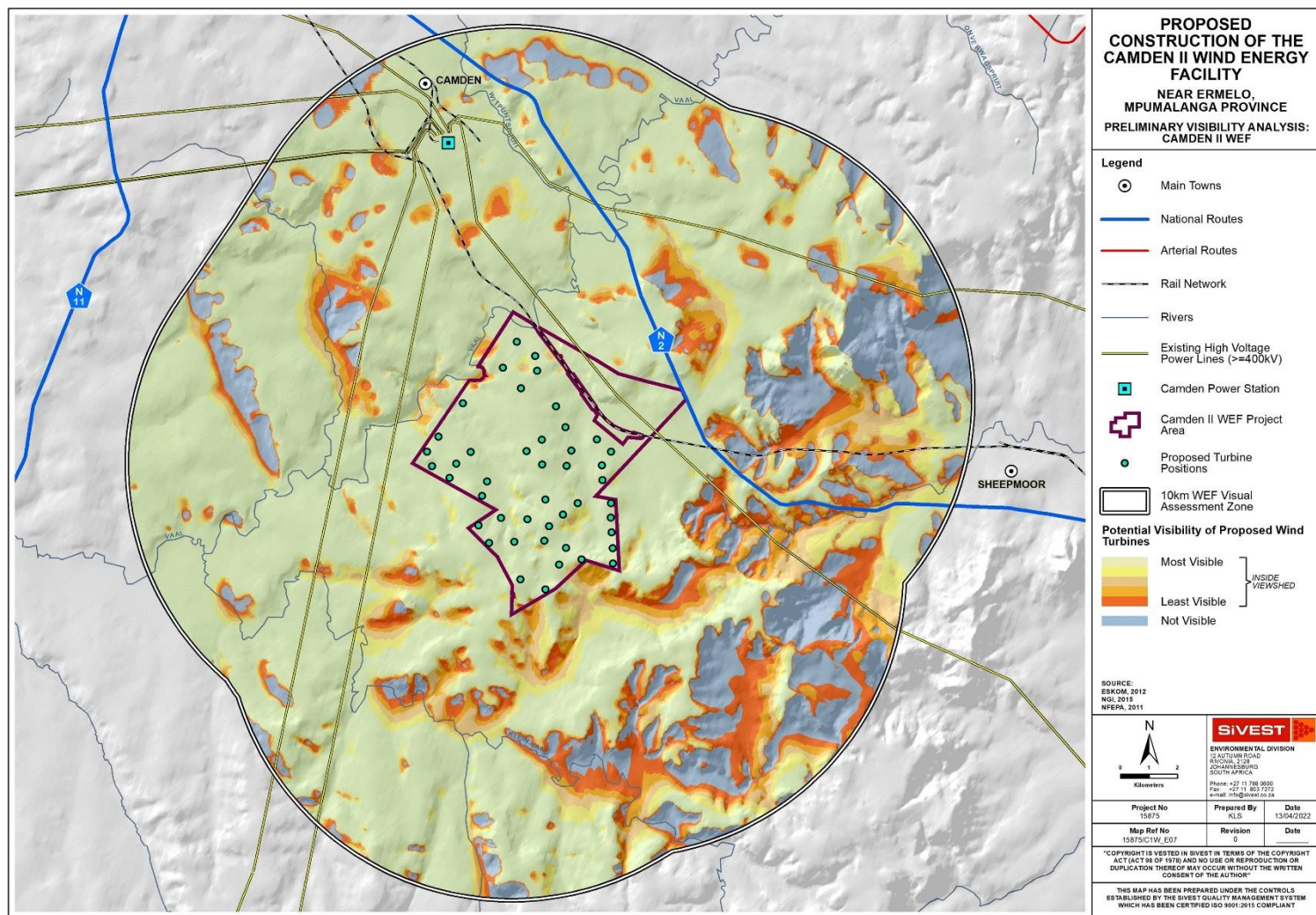


Figure 13: Potential visibility of wind turbines

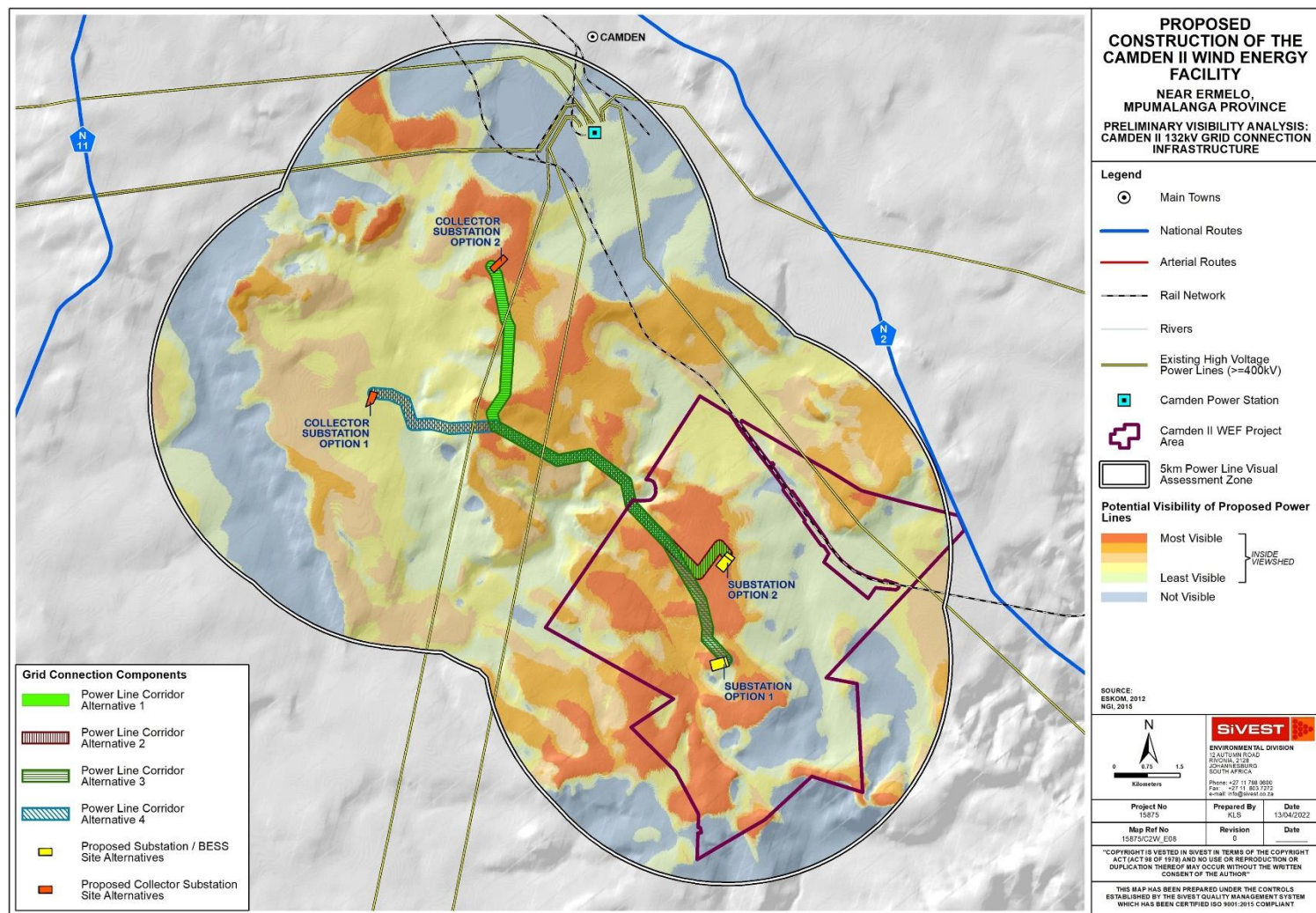


Figure 14: Potential visibility of Camden II WEF power lines

6.1.2 Vegetation

According to Mucina and Rutherford (2006), the study area is largely dominated by three vegetation types, namely the Amersfoort Highveld Clay Grassland, the Eastern Highveld Grassland and the Wakkerstroom Maontane Grassland vegetation types (**Figure 15**). Amersfoort Highveld Clay Grassland in the south-western sector of the study area is associated with undulating grassland plains, largely dominated by a dense *Themeda triandra* sward, often forming a short lawn as a result of grazing. The Eastern Highveld Grassland, in the eastern half of the study area is characterised by short dense grassland with scattered rocky outcrops where some woody species occur (**Figure 16**). Wakkerstroom Maontane Grassland is largely associated with the areas of greater relief in the south-eastern sector of the study area and is characterised by short montane grasslands on the plateaus and short forest thickets occurring on the steeper slopes.

Much of the natural vegetation cover has however been partly removed or transformed by cultivation as well as the presence of tall exotic trees scattered in clusters across the study area and around farmsteads (**Figure 17**).

Visual Implications

Although the proposed development will contrast significantly with the predominant vegetative cover in the area, scattered trees and shrubs will provide some degree of screening thus potentially reducing impacts experienced by the potentially sensitive receptors in the area. In addition, tall trees planted around many farmhouses in the area will restrict views from these receptor locations.

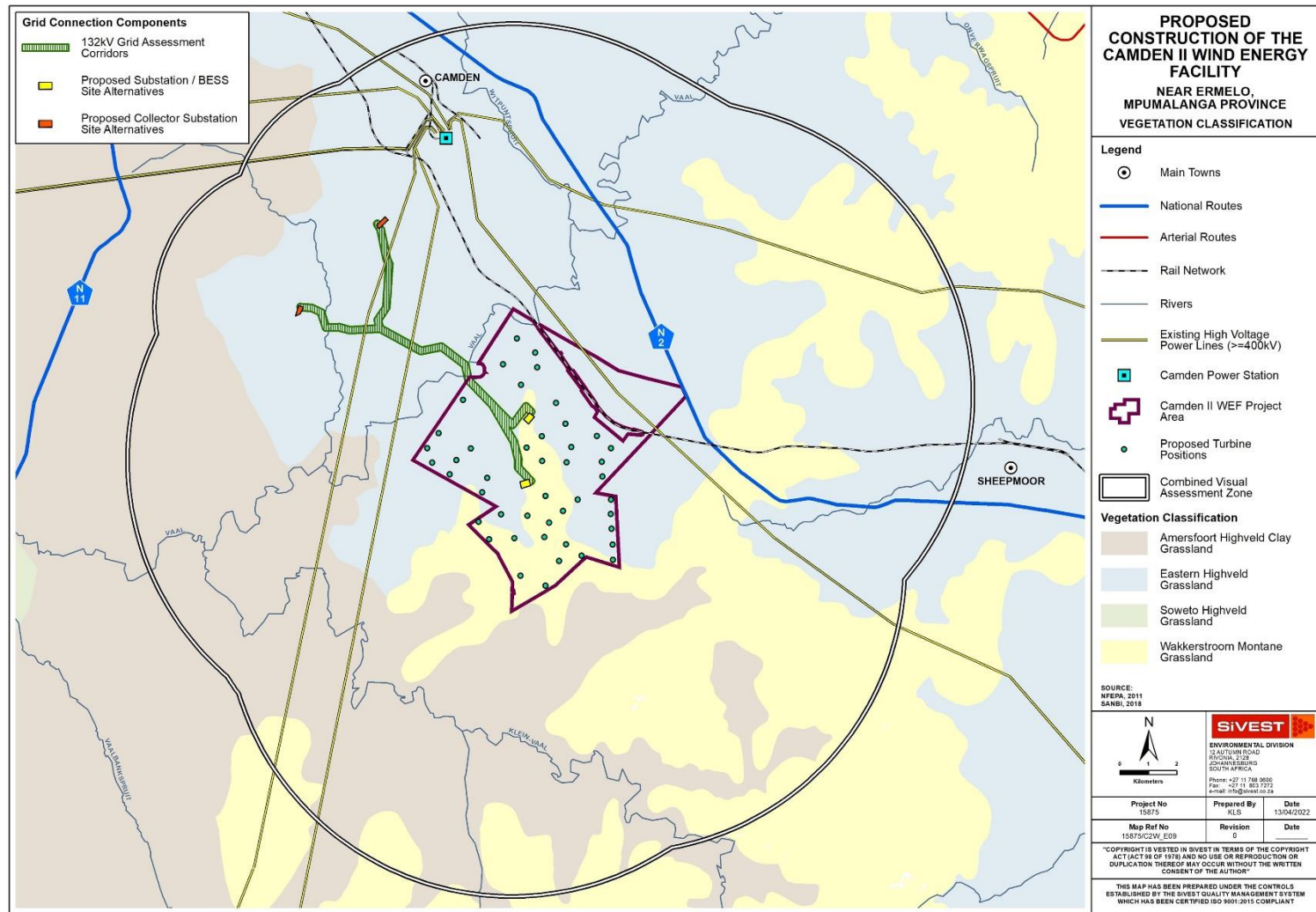


Figure 15: Vegetation Classification in the Study Area



Figure 16: Grasslands in the eastern sector of the study area.



E

Figure 17: Clusters of trees scattered across the study area.

6.1.3 Land Use

According to the South African National Land Cover dataset (Geoterrimage 2020), much of the visual assessment area is classified as “Grassland” interspersed with significant areas of “Cultivation”. Small tracts of forested land and numerous water bodies are scattered throughout the study area (**Figure 18**).

Commercial agriculture is the dominant activity in the study area, with the main focus being maize and soybean cultivation (**Figure 19**) and livestock grazing (**Figure 20**). There are multiple farm portions in the study area, resulting in a relatively moderate density of rural settlement with many scattered farmsteads in evidence. Built form in much of the study area comprises farmsteads, ancillary farm buildings and workers’ dwellings, gravel access roads, telephone lines, fences and windmills (**Figure 21**).

High levels of human influence are however visible in the northern sector of the study area caused by the presence of Camden Power Station (**Figure 22**) and the adjacent Camden residential area and associated high voltage power lines (**Figure 23**),

Other evidence of significant human influence includes a Mooiplaats Colliery located to the west of the N11 national route, as well as road, rail (**Figure 24**), telecommunications and a network of high voltage electricity infrastructure (**Figure 25**). Multiple dirt roads are further evident throughout the site connecting the various farm activities.

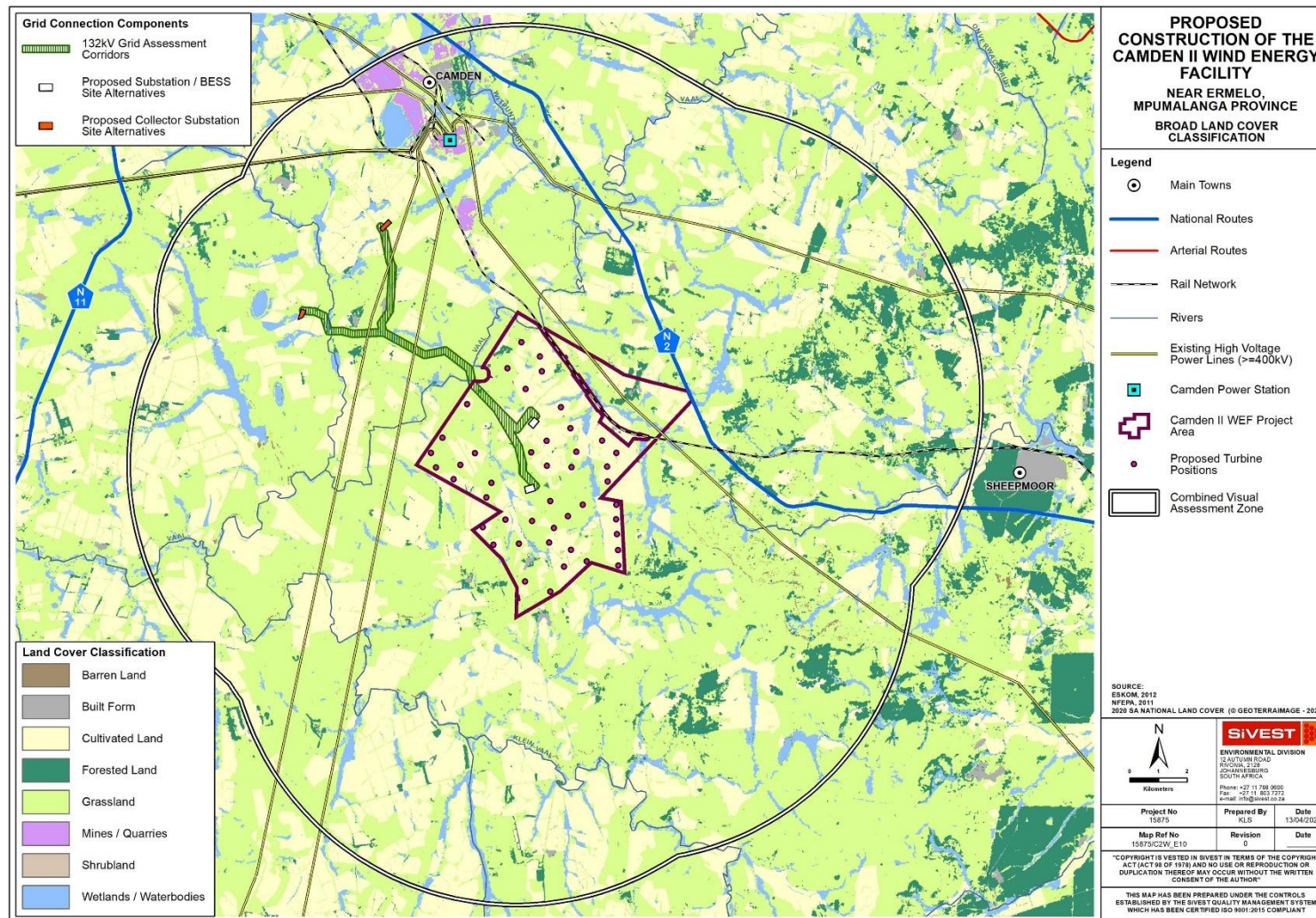


Figure 18: Land Cover Classification



Figure 19: Maize cultivation in the Camden II WEF project area.



Figure 20: Livestock grazing is common in the study area.



Figure 21: Typical farm infrastructure in the study area.



Figure 22: View of Camden Power Station and adjacent residential area to the west of the N2 national route.



Figure 23: High voltage power lines feeding into Camden Power Station.



Figure 24: Rail infrastructure, power lines and grain silos in the north-eastern sector of the Camden II WEF project area.



Figure 25: High voltage power lines crossing the N2 north of the Camden II WEF project area.

Visual Implications

The predominance of cultivated land in conjunction with the remaining natural grassland cover across much of the study area would give the viewer the general impression of a largely rural / pastoral setting. Thus, the proposed Camden II WEF development and associated grid connection infrastructure would alter the visual character and contrast with the typical land use and/or pattern and form of human elements present across the development site and across much of the study area.

High levels of human transformation and visual degradation are however evident in the north where Camden Power Station and associated residential and infrastructural development as well as mining activity dominate the landscape. In addition, roads, railways and power lines have further degraded the visual character of the study area to some degree. This transformation has already altered the visual character across much of the northern sector of the study area, thus reducing the level of contrast of the proposed development.

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 physical and land use-related characteristics of the study area as described above 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 including 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.

The predominant land use in the area (maize cultivation) has significantly transformed the natural landscape across much of the study area. In addition, the landscape becomes progressively more transformed towards the northern boundary of the study area where Camden Power Station and mining activities have resulted in a high degree of visual degradation. The more industrial character of the landscape is an important factor in this context, as the introduction of the proposed WEF and associated grid connection infrastructure would result in less visual contrast where other anthropogenic elements are already present, especially where the scale of those elements is similar to that of the proposed development.

The scenic quality of the landscape is also an important factor that contributes to the visual character or inherent sense of place. Visual appeal is often associated with unique natural features or distinct variations in form. As such, the pastoral landscape and rolling hills in parts of the study area are important features that could increase the visual appeal and visual interest in the area.

Cultural landscapes are becoming increasingly important concepts in terms of the preservation and management of rural and urban settings across the world. The concept of 'cultural landscape' is a way of looking at a place that focuses on the relationship between human activity and the biophysical environment (Breedlove, 2002). In this instance, the rural / pastoral landscape represents how the environment 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 Ermelo, engulfed by an otherwise rural / pastoral environment, form an integral part of the wider landscape.

In light of this, it is important to assess whether the introduction of a WEF and associated grid connection infrastructure into the study area would be a degrading factor in the context of the prevailing character of the cultural landscape. Broadly speaking, visual impacts on the cultural landscape in the area around the proposed development would be reduced by the fact that the visual character in much of the area has been significantly transformed and degraded by mining and infrastructural development.

6.3 Visual Sensitivity Analysis and Verification

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 or nature-based 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 WEF or a power line would be likely to be perceived negatively by receptors in this area as 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									
		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 a typical rural / pastoral 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 a typical rural / pastoral 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	Relatively few tourism/leisure based facilities in the area										
International / regional / local status of the environment	Study area is typical of rural / pastoral landscapes										
**Scenic quality under threat / at risk of change	Introduction of a WEF and associated 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 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 to moderate** 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 and this has been factored into the sensitivity rating above. The presence of visual receptors is examined in more detail in **Section 8** of this report.

The rating has also taken into account the Langcarel Private Nature Reserve identified in the South African Protected Areas Database (incremental release Quarter 2 2021). Field investigation found no outward indication of the presence of a nature reserve in this area and much of the land within the demarcated reserve is utilised for commercial cultivation, while the land parcels involved are all managed for agricultural purposes (commercial farming).. The reserve includes farm properties that form part of the nearby Camden I WEF project area (within the Camden Renewable Energy Complex development area) and it is known that the land owners support the proposed development. Accordingly, visual sensitivities normally associated with nature reserves will be reduced in this instance..

During the initial stages of the EIA, a site sensitivity assessment was undertaken to inform the site layout for the WEF and the power line route alignment. The aim of this exercise was to indicate any areas of the application site or grid assessment corridors which should be precluded from the development footprint. From a visual perspective, sensitive areas would be areas where the establishment of wind turbines, power lines or substations would result in the greatest probability of visual impacts on sensitive or potentially sensitive visual receptors.

6.3.1 WEF Site Sensitivity

Using GIS-based visibility analysis, it was possible to determine that the tip of at least one turbine blade (ie at a maximum height of 300m) would be visible from most of the identified potentially sensitive receptors in the study area and as such, no areas on the site are *significantly* more visible than the remainder of the site. It should be noted however that the visual prominence of a very tall structure such as a wind turbine would be exacerbated if located on a ridge top or a relatively high lying plateau. As such, it is recommended that wind turbines should preferably not be located on the highest ridges within the WEF development area. While these ridges could be seen as areas of potentially high visual sensitivity, the study area as a whole is rated as having a low to moderate visual sensitivity, and as such, the sensitivity rating would be reduced to “Medium-High”. Hence the ridges **are not** considered to be “no go areas”, but rather should be viewed as zones where turbine placement would be least preferred.

From a visual perspective, another aspect is the direct visual impact of the turbines on any farmsteads or receptors located on the application site. Accordingly, a visual sensitivity zone of 500m has been delineated around the existing residences on the application site and also around any receptors located within 500m of the site boundary. In addition, it is recommended that a 300m visual sensitivity zone is applied on either side of the district roads which traverse the WEF project area.

The preclusion of turbine development from these zones would reduce the direct impact of the turbines on the occupants of the farmsteads and on passing motorists, especially those impacts related to shadow flicker (see **Section 7.1.1** below). At this stage however, the visual sensitivity zones are ***not*** considered “no go” areas, but rather should be viewed as zones where development should be limited. It should be stressed that these zones apply to turbine development only. The visual impacts resulting from the associated on-site infrastructure are considered to have far less significance when viewed in the context of multiple wind turbines and as such the associated on-site infrastructure has been excluded from the sensitivity analysis.

The areas identified as visually sensitive to WEF development are shown in **Figure 26**
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6.3.2 Power Line Route Sensitivity

GIS-based visibility analysis in respect of the Camden II WEF 132kV power line route alignments determined that no sections of the route alignment are *significantly* more visible than any other. As such, in terms of visibility, no sections of the route alignment were found to be more sensitive than others.

In considering the possible visual impact of the power line or substations on any nearby farmsteads or receptors, investigation determined that there are four farmsteads within 500m of the assessment corridors (GVR13, GVR24, GVR25 and GVR26). However, GVR24, GVR25 AND GVR26 are located in close proximity to existing 400kV power lines and are located within the Camden I WEF project area, while GVR13 is located within the Camden II WEF project area. It is known that the land owners support the Camden Renewable Energy Complex project and would not perceive the proposed power lines in a negative light. Accordingly, no areas of visual sensitivity were identified in relation to any of the corridor alternatives.

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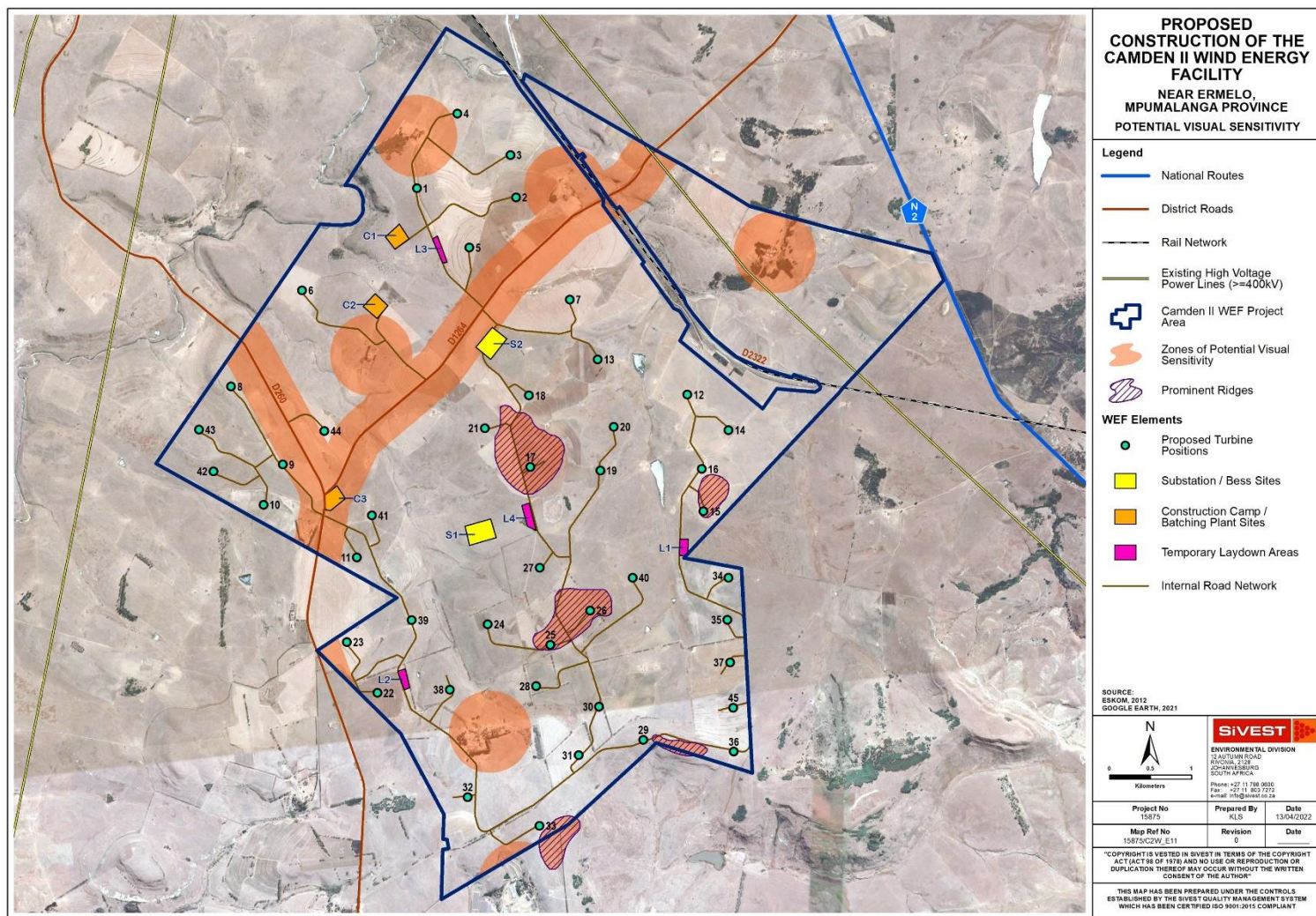


Figure 26: Zones of potential visual sensitivity on the Camden II WEF Site

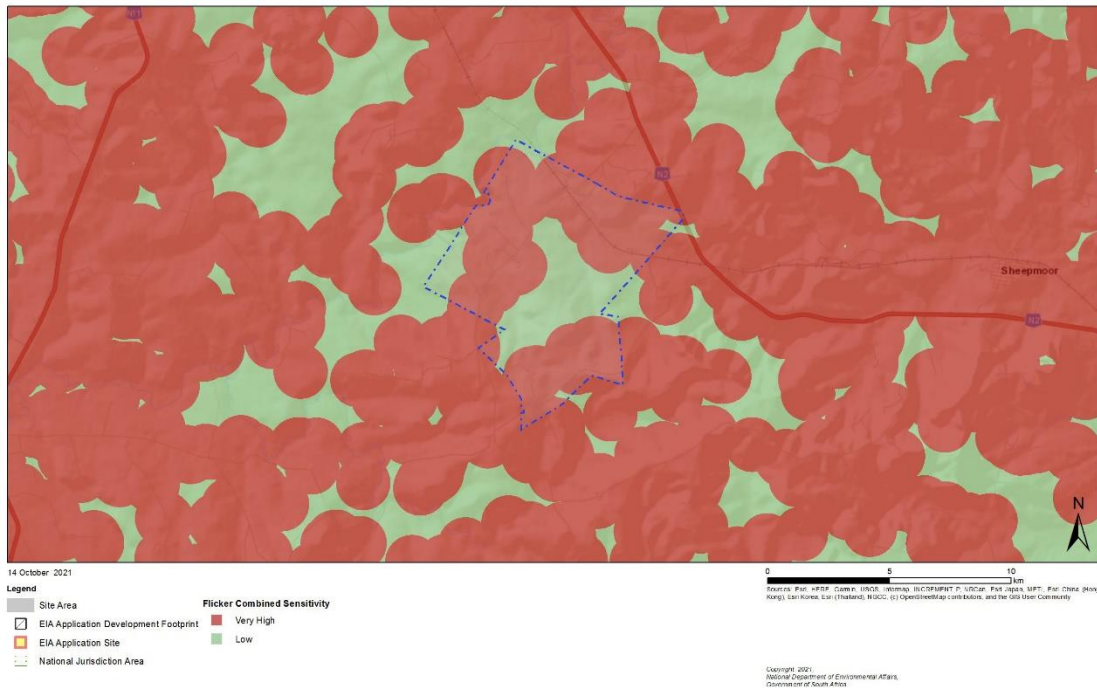


Figure 28: Flicker Sensitivity (October 2021)

The Screening Tool provides a very high level, desktop assessment and as such the results of the study must be viewed against the findings of the field investigation as well as factors affecting visual impact, such as:

- the presence of visual receptors;
- the distance of those receptors from the proposed development; and
- the likely visibility of the development from the receptor locations.

6.3.4 Sensitivity Analysis Summary for WEF Development

Although the Screening Tool identifies significant areas of very high landscape and flicker sensitivity, the site sensitivity verification exercise conducted in respect of this VIA found little evidence to support this sensitivity rating. The sensitivity rating for this site is heavily influenced by the Langcarel Private Nature Reserve which is identified in the South African Protected Areas Database. As stated however, the area is entirely managed for commercial agriculture with no conservation activities present and no evidence of public access to the site. Any landscape value or visual appeal has therefore been reduced.. Accordingly, the site is not subject to the usual visual / landscape sensitivity associated with nature reserves.

In addition, the desktop topographic assessment of the area did not indicate the presence of mountaintops, *high* ridges or any significantly steep slopes. This assessment, confirmed by the field investigation, showed the presence of a few relatively prominent ridges in a largely

undulating landscape. The sensitivity analysis above has recognised these ridges and identified the highest ridge tops as zones where development would be least preferred.

The presence of receptors, either within the Camden II WEF project area, or within 500m of the site boundary, was confirmed by the site sensitivity verification exercise. However, an assessment of receptor locations using Google Earth showed that there were no receptors present at some of the locations identified by the National Screening Tool. The remaining (confirmed) receptors were factored into the sensitivity analysis, together with an 500m buffer which is considered sufficient to reduce any adverse effects of shadow flicker.

6.3.5 Sensitivities identified by the National Screening Tool: Power Line Route Alternatives

The National Environmental Screening Tool does not identify any landscape sensitivities in respect of the proposed grid connection infrastructure.

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 and the areas of cultivation and grassland would reduce the visual absorption capacity, this would be offset to some degree by the presence of Camden Power Station, mining and infrastructural development in the vicinity of the proposed Camden II WEF project and associated grid connection infrastructure.

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

7 TYPICAL VISUAL IMPACTS ASSOCIATED WITH WIND ENERGY FACILITIES

In this section, the typical visual issues related to the establishment of a WEF and associated grid connection infrastructure as proposed are discussed. It is important to note that the renewable energy industry is still relatively new in South Africa and as such this report draws on international literature and web material (of which there is significant material available) to describe the generic impacts associated with WEFs.

7.1 Wind Energy Facilities

As previously mentioned, at this stage it is anticipated that the proposed project will consist of up to 45 wind turbines and associated on-site infrastructure with a total generation capacity of up to 200MW. The wind turbines will have a hub height of up to 200m and a rotor diameter of up to 200m. The height of the turbines and their location on gently undulating terrain would result in the development typically being visible over a large area (**Figure 29**).



Figure 29: Wind turbines at Noupoort Wind Farm, near Noupoort, Northern Cape Province.

Internationally, studies have demonstrated that there is a direct correlation between the number of turbines and the degree of objection to a wind farm, with less opposition being encountered when fewer turbines are proposed (Devine-Wright, 2005). Certain objectors to wind farms also mention the “sky space” occupied by the rotors of a turbine, this being the area in which the rotors would rotate.

The visual prominence of wind turbines would be exacerbated within natural settings, in areas of flat terrain or if located on ridge tops. Given the height of the turbines, even dense stands of wooded vegetation are only likely to offer partial visual screening.

7.1.1 Shadow Flicker

Shadow flicker may occur when the sun is low on the horizon and shines through the rotating blades of a wind turbine, resulting in a moving shadow. The rotating blades repeatedly cast a shadow which will be perceived as a “flicker” and this flicker effect can potentially impact on residents located near the wind turbines.

The effect of shadow flicker is however only likely to be experienced by people situated directly within the shadow cast by the blade of the wind turbine. As such, shadow flicker is only expected to have an impact on, and cause health risks to, people residing in houses located relatively close to a wind turbine and at a specific orientation, particularly in areas where there is little screening present. Shadow flicker may also be experienced by and impact on motorists if a wind turbine is located in close proximity to an existing road.

The impact of shadow flicker can be effectively mitigated by choosing the correct site and layout for the wind turbines, taking into consideration the orientation of the turbines relative to the nearby houses and the latitude of the site. Hence appropriate development restriction zones around residences will reduce the adverse effects of shadow flicker, while tall structures and trees will also obstruct shadows and prevent the effect of shadow flicker from impacting on surrounding residents. In this instance, appropriate restriction zones have been recommended in **Section 6.3.1**, and trees planted around many of the nearby farmsteads will reduce the likelihood of flicker impacts.

7.1.2 Motion-based visual intrusion

An important component of the visual impacts associated with wind turbines is the *movement* of the rotors. Labelled as motion-based visual intrusion, this refers to the tendency of the viewer to focus on discordant, moving features when scanning the landscape. Evidence from surveys of public attitudes towards wind farms suggest that the viewing of moving blades is not necessarily perceived negatively (Bishop and Miller, 2006). The authors of the study suggest two possible reasons for this; firstly, when the turbines are moving they are seen as being ‘at work’, ‘doing good’ and producing energy. Conversely, when they are stationary they are regarded as a visual intrusion that has no evident purpose. Such instances are however likely to be quite rare as inoperative turbines are not considered advantageous and the facility operators would seek to avoid this situation wherever possible

More interestingly, the second theory regarding this perception is related to the intrinsic value of wind in certain areas and how turbines may be an expression or extension of an otherwise ‘invisible’ presence. Famous winds across the world include the Mistral of the Camargue in

France, the Föhn in the Alps, or the Bise in the Lavaux region of Switzerland. The wind, in these cases, is an intrinsic component of the landscape, being expressed in the shape of trees or drifts of sands, but being otherwise invisible. Bishop and Miller (2006) argue that wind turbines in these environments give expression, when moving, to this quintessential landscape element. In a South African context, this phenomenon may well be experienced if wind farms are developed in areas where typical winds, like berg winds, or the south-easter in the Cape are an intrinsic part of the environment. In this way, it may even be possible that wind farms will, through time form part of the cultural landscape of an area, and become a representation of the opportunities presented by the natural environment.

7.2 Associated On-Site Infrastructure

The infrastructure associated with the proposed Camden II WEF will include the following:

- A new IPP on-site substation;
- Medium voltage (33kV) cables, buried underground wherever technically feasible;
- A Battery Energy Storage System (BESS) located next to the onsite substation, comprising batteries, power conversion system and transformer which will all be stored in various rows of containers;
- Internal roads;
- A construction laydown / staging area;
- Operation and Maintenance (O&M) buildings; and
- A temporary cement batching plant.

Substations are generally large, highly visible structures which are more industrial in character than many other components of a WEF. As they are not features of the natural environment, but are representative of human (anthropogenic) alteration, substations will be perceived to be incongruous when placed in largely natural landscapes. Conversely, the presence of other anthropogenic objects associated with the built environment, especially other substations or power lines, may result in the visual environment being considered to be 'degraded' and thus the introduction of a substation into this setting may be less of a visual impact than if there was no existing built infrastructure visible. In this instance, the substation is intended to serve the proposed Camden II WEF project and as such, is likely to be perceived as part of the greater WEF development. Thus, the visual impact of the substation will be relatively minor when compared to the visual impact associated with the WEF development as a whole.

Surface clearance for cable trenches, access roads, laydown areas and other on-site infrastructure may result in the increased visual prominence of these features, thus increasing the level of contrast with the surrounding landscape. Buildings, BESS containers and associated infrastructure placed in prominent positions such as on ridge tops may break the natural skyline, drawing the attention of the viewer. In addition, security lighting on the site may impact on the nightscape (**Section 8.4**).

The visual impact of the on-site infrastructure associated with a WEF is generally not regarded as a significant factor when compared to the visual impact associated with wind turbines. The infrastructure would however increase the visual “clutter” on the WEF site and magnify the visual prominence of the development if located on ridge tops or flat sites in natural settings where there is limited tall wooded vegetation to conceal the impact.

7.3 Grid Connection Infrastructure

Grid connection infrastructure for this project includes overhead 132kV power lines linking the on-site substation to proposed Camden Collector Substation.

Power line towers are by their nature very large objects and thus highly visible. It is understood that the maximum tower height envisaged for the proposed power line is expected to be 35 m (approximately equivalent in height to an ten 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 400m apart in a linear alignment.

As power lines are not features of the natural environment, they 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 taller vegetation from areas within the power line servitude can increase the visibility and incongruity of the power line. In a largely natural, bushy 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 servitude.

In this instance, the proposed grid connection infrastructure is intended to serve the proposed WEF and as such, will only be built if this project is developed. The power lines and substations are therefore likely to be perceived as part of the greater WEF development and the visual impact will be relatively minor when compared to the visual impact associated with the development as a whole.

8 SENSITIVE VISUAL RECEPTORS

A sensitive visual receptor location is defined as a location 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 EIA study.

As the visibility of the development would diminish exponentially over distance (refer to **section 5.4** above), receptor locations which are closer to the WEF or power line 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 landscape character of the surrounding area.

8.1 Receptor Identification

Preliminary desktop assessment of the study area for the proposed Camden II WEF identified multiple farmsteads and residences within the combined study area for the Camden II WEF and associated grid connection infrastructure. While these homesteads and residences could be considered to be receptors, not all of them would be sensitive to the proposed development. In light of this, the focus of the receptor assessment in this VIA will be on those receptors identified as being sensitive. These would therefore include three receptors found to be linked to leisure / tourism facilities namely:

- Indawo Game Ranch and Hotel;
- Overvaal Guest House: and
- Vonkelfontein Guest House.

Also included as sensitive receptors are two specific residences whose occupants have, in the early stages of the project, expressed some concern about the proposed development. These receptors are located on the Portion 2 and Remainder of the Farm Mooiplaats No 290.

It should be noted that, in general, farmsteads could be regarded as *potentially sensitive* visual receptors as they are located within a mostly rural setting with pastoral / natural vistas that will likely be altered by the proposed development. However, given the sheer number of farmsteads in the study area, the level of transformation and the fact that local sentiments toward the proposed development are unknown at this stage, the receptor assessment has only included those farmsteads within 2km of the nearest of turbine and within 5 km of the nearest corridor alternative. As a result, the receptor assessment includes thirty-three (33) potentially sensitive receptors, seven (7) of which are located within the Camden II WEF project, area and are known to be in favour of the proposed WEF development.

The residential area of Camden is located on the northern periphery of the Camden II WEF study area. While residences in this area could be considered as receptors, they are not believed to be sensitive due to their location within a predominantly built-up, heavily transformed area adjacent to Camden Power Station.

In many cases, roads along which people travel, are regarded as sensitive receptors. The primary thoroughfare in the study area is the N2 national route which links Piet Retief in the east with Ermelo to the north and Gauteng Province to the north-west.

The sections of this road traversing the study area are not considered part of designated scenic route, although the road is an important link and is likely to be utilised, to some extent, by tourists exploring this part of Mpumalanga Province. As a result, the N2 is considered to be a potentially sensitive receptor road – i.e. a road being used by motorists who may object to the potential visual intrusion of the proposed WEF and associated infrastructure.

Other thoroughfares in the study area are primarily used as local access roads and do not form part of any scenic tourist routes. These roads are not specifically valued or utilised for their scenic or tourism potential and are therefore not regarded as visually sensitive.

As previously stated, the South African Protected Areas Database identifies the Langcarel Private Nature Reserve within the Camden II WEF study area. The area is however entirely managed for commercial agriculture with no conservation activities present, and therefore any visual appeal has been reduced.. Accordingly, the reserve is not considered to be a sensitive receptor. Furthermore, the reserve includes farm properties that form part of the adjacent Camden I WEF project area and it is known that the land owners support the proposed WEF development and associated grid connection infrastructure.

The identified potentially sensitive visual receptor locations for the proposed WEF and grid connection are indicated in **Figure 30** and **Figure 31** respectively.

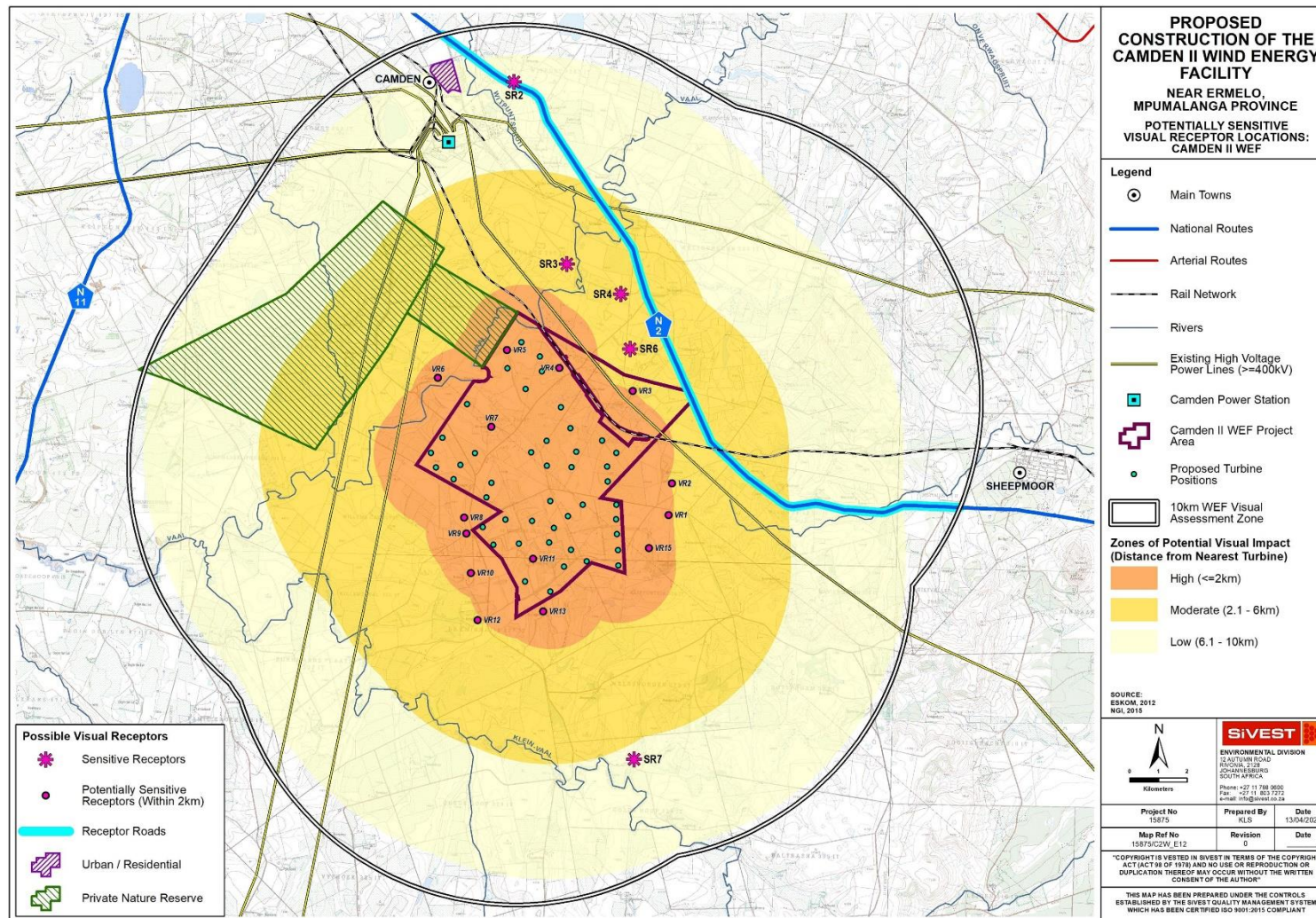


Figure 30: Sensitive receptor locations within 10kms of the Camden II WEF application site

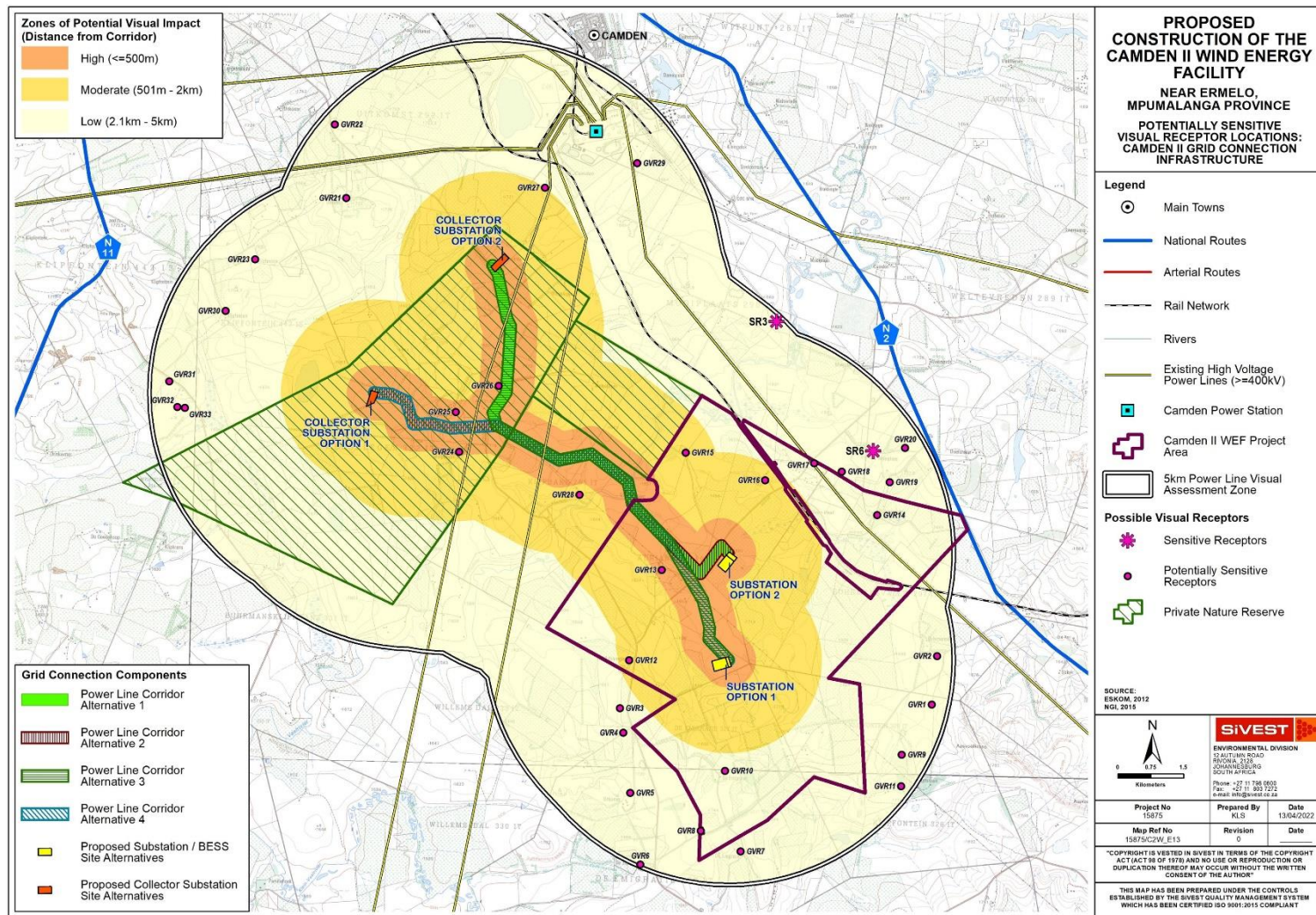


Figure 31: Potentially sensitive receptor locations within 5kms of the nearest power line corridor

8.2 Receptor Impact Rating

In order to assess the impact of the proposed WEF and associated grid connection infrastructure 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 the factors 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 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.

8.2.1 Distance

As described above, 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 2km of the nearest turbine. The visual impact of a WEF beyond 10km would be negligible as the development would appear to merge with the elements on the horizon. Any visual receptor locations beyond these distance limits have therefore not been assessed as they fall outside the study area and would not be visually influenced by the proposed development.

At this stage of the process, zones of visual impact for the proposed WEF have been delineated according to distance from the nearest turbine. Based on the height and scale of the WEF project, the distance intervals chosen for the zones of visual impact, as shown in **Figure 30**, are as follows:

- 0 – 2km (high impact zone);
- 2km – 6km (moderate impact zone);
- 6km - 10km (low impact zone).

Zones of visual impact for the proposed power lines have been delineated according to distance from the combined power line assessment corridors. Based on the likely height of the power

line towers, the distance intervals chosen for the zones of visual impact, as shown in **Figure 31** are as follows:

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

8.2.2 Screening Elements

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.

8.2.3 Visual Contrast

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 change the visual character of the landscape and have a significant visual impact on sensitive receptors.

In order to determine the likely visual compatibility of the proposed development, the study area was classified into the following zones of visual contrast:

- **High** – undeveloped / natural / rural areas.
- **Moderate** –
 - areas within 500m of existing power lines ($\geq 88\text{kV}$);
 - areas within 500m of N2, N11, R39 and R64 main roads;
 - areas within 500m of railway infrastructure;
 - cultivated areas and smallholdings.
- **Low** –
 - areas within 500m of urban / built-up areas;
 - areas within 500m of quarries / mines etc;
 - areas within 500m of Camden Power Station;

These zones are depicted in **Figure 32** below.

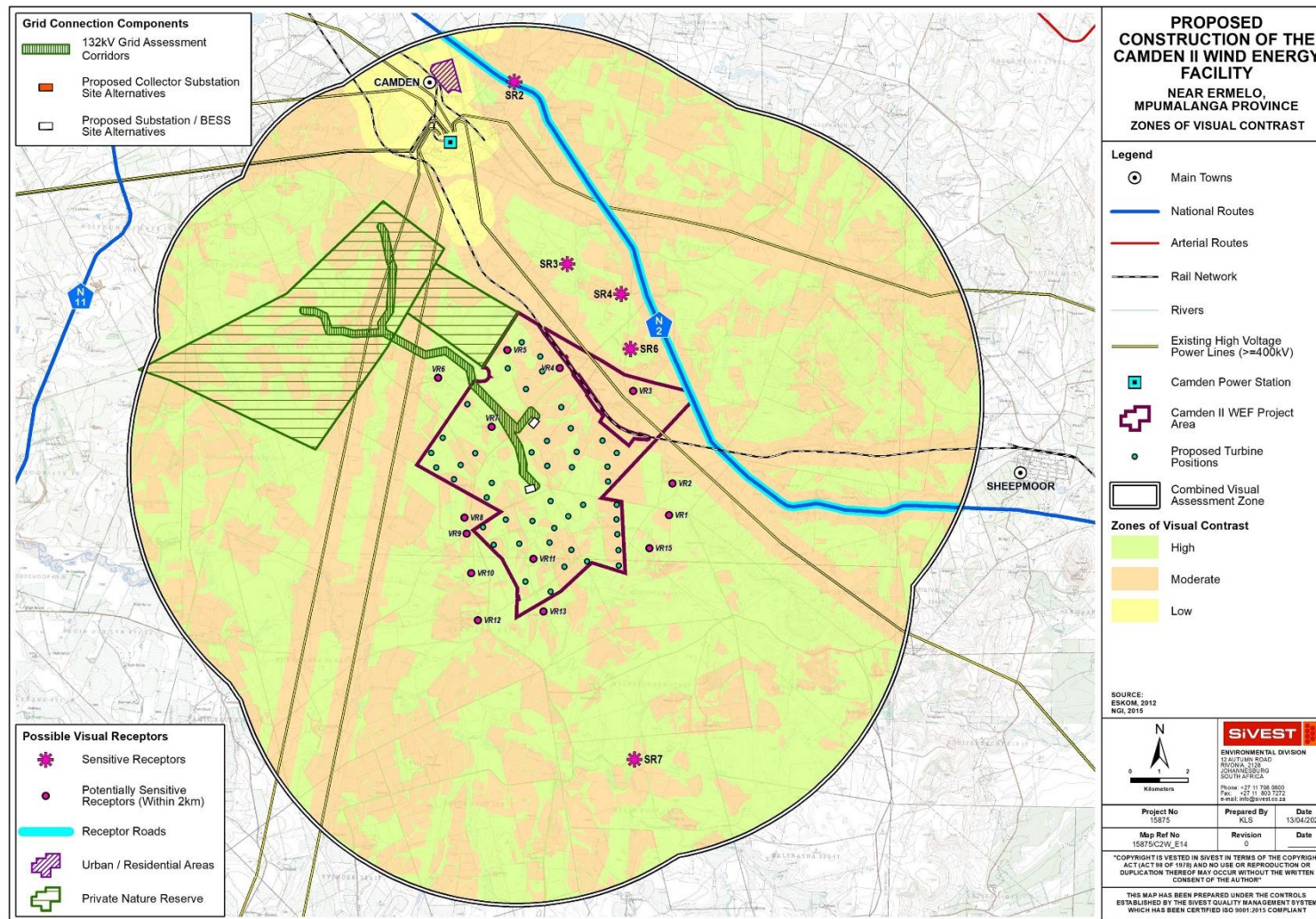


Figure 32: Zones of Visual Contrast

8.2.4 Impact Rating Matrix

The receptor impact rating matrix returns a score which in turn determines the visual impact rating assigned to each receptor location (**Error! Reference source not found.**) 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.

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

VISUAL FACTOR	VISUAL IMPACT RATING			<u>OVERRIDING FACTOR:</u> NEGLIGIBLE
	HIGH	MODERATE	LOW	
Distance of receptor away from proposed development	WEF: <= 2km Grid: <= 500m Score 3	WEF: 2 - 6km Grid: 500m - 2km Score 2	WEF: 6km - 10km Grid: 2km - 5km Score 1	>10km
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 Camden II WEF on each of the sensitive visual receptor locations identified within 10kms of the boundary of the Camden II WEF application site. Also included are the ten potentially sensitive receptors identified within 2km of the nearest turbine placement, but outside the Camden II WEF project area.

Table 5: Receptor impact rating for the proposed Camden II WEF Project

Receptor Location	Distance to nearest Turbine			Screening		Contrast		OVERALL IMPACT RATING	
	KMs	Rating		Rating		Rating		Rating	
SR2 - Indawo Game Ranch	9.1	Low	1	Mod	2	Mod	2	MODERATE	5
SR3 - Homestead on Ptn 2 of Mooiplaats No 290	3.1	Mod	2	Mod	2	High	3	MODERATE	7
SR4 - Homestead on Rem of Mooiplaats No 290	3.6	Mod	2	Low	1	Mod	2	MODERATE	5
SR6 - Overvaal Guest House	3.1	Mod	2	Low	1	Mod	2	MODERATE	5
SR7 - Vonkelfontein Private Lodge*	NIL								
VR1 - Farmstead	1.9	High	3	High	3	Mod	2	HIGH	8
VR2 - Farmstead	2.1	Mod	2	Mod	2	Mod	2	MODERATE	6
VR6 - Farmstead	1.4	High	3	Mod	2	Mod	2	MODERATE	7
VR8 - Farmstead	0.8	High	3	Mod	2	High	3	HIGH	8
VR9 - Farmstead	0.6	High	3	Mod	2	Mod	2	MODERATE	7
VR10 - Farmstead	1.2	High	3	Low	1	Mod	2	MODERATE	6
VR12 - Farmstead	2.1	Mod	2	Mod	2	High	3	MODERATE	7
VR13 - Farmstead	0.7	High	3	Low	1	Mod	2	MODERATE	6
VR15 - Farmstead	1.1	High	3	High	3	Mod	2	MODERATE	7

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

The table above shows that none of the identified sensitive receptors would experience high levels of visual impact as a result of the proposed Camden II WEF development. Four of these receptors are expected to experience only moderate levels of visual impact, while the remaining receptor is outside the viewshed for the proposed WEF. With regard to the Indawo Game Ranch and Overvaal Guest house, details of the levels of leisure / tourism activities on different sectors of the relevant farms are not known and as such, the impact rating matrix for these receptors is based on the assumed location of the main accommodation complex on each property.

Of the fourteen (14) *potentially* sensitive receptor locations located within 2 kms of the nearest turbine placement, five (5) are located within the Camden II WEF project area. It has been assumed that the relevant land owners are involved in the project and as such are not expected to perceive the proposed development in a negative light. Accordingly, these receptors have

been removed from the impact rating matrix. Two of the remaining receptor locations are expected to experience high levels of visual impact as a result of the WEF development due to their proximity to the nearest turbine placement in conjunction with the lack of any form of screening and / or high levels of contrast. As stated however, the actual degree of visual impact experienced at these locations will depend on the viewer's perception and their sentiments toward the proposed development. The remaining seven potentially sensitive receptor locations will experience moderate levels of impact as a result of the WEF development.

It should be noted that these ratings have been updated in relation to the refined turbine layout for the Camden II WEF provided by the Proponent for assessment in the EIA Phase of the project.

Error! Reference source not found. below presents a summary of the overall visual impact of the proposed 132kV power line on each of the potentially sensitive visual receptor locations identified within 5kms of the boundary of the nearest assessment corridor.

Table 6: Receptor Impact rating for the proposed 132kV Power Line

Receptor Location	Distance to Nearest Corridor Alternative			Screening		Contrast		OVERALL IMPACT RATING	
	KMs	Rating		Rating		Rating		Rating	
SR3 - Homestead on Ptn 2 of Mooiplaats No 290	4.9	Low	1	Mod	2	High	3	MODERATE	6
SR6 - Overvaal Guest House	3.9	Low	1	Low	1	Mod	2	LOW	4
GVR1 - Farmstead	4.6	Low	1	High	3	Mod	2	MODERATE	6
GVR2 - Farmstead	4.6	Low	1	Mod	2	Mod	2	MODERATE	5
GVR3 - Farmstead	2.4	Low	1	Mod	2	High	3	MODERATE	6
GVR4 - Farmstead	2.8	Low	1	Mod	2	Mod	2	MODERATE	5
GVR5 - Farmstead	3.6	Low	1	Low	1	Mod	2	LOW	4
GVR6 - Farmstead	4.9	Low	1	Mod	2	High	3	MODERATE	6
GVR7 - Farmstead*	NIL								
GVR8 - Farmstead*	NIL								
GVR9 - Farmstead*	NIL								
GVR10 - Farmstead^	2.4	Low	1	Low	1	High	3	MODERATE	5
GVR11 - Farmstead	4.7	Low	1	Low	1	High	3	MODERATE	5
GVR12 - Farmstead^	1.8	Mod	2	Mod	2	Mod	2	MODERATE	6
GVR13 - Farmstead^	0.3	High	3	Low	1	High	3	MODERATE	7
GVR14 - Farmstead^	3.4	Low	1	Low	1	Mod	2	LOW	4
GVR15 - Farmstead^	1.4	Mod	2	Low	1	High	3	MODERATE	6
GVR16 - Farmstead^	1.7	Mod	2	Low	1	Mod	2	MODERATE	5

GVR17 - Farmstead^	2.7	Low	1	High	3	Mod	2	MODERATE	6
GVR18 - Farmstead	3.1	Low	1	High	3	Mod	2	MODERATE	6
GVR19 - Farmstead	3.9	Low	1	Low	1	Mod	2	LOW	4
GVR20 - Farmstead	4.6	Low	1	Low	1	Mod	2	LOW	4
GVR21 - Farmstead#	3.5	Low	1	High	3	Mod	2	MODERATE	6
GVR22 - Farmstead#	4.7	Low	1	Mod	2	Mod	2	MODERATE	5
GVR23 – Farmstead*	NIL								
GVR24 - Farmstead	0.4	High	3	Low	1	Mod	2	MODERATE	6
GVR25 - Farmstead#	0.2	High	3	Low	1	Mod	2	MODERATE	6
GVR26 - Farmstead#	0.1	High	3	Mod	2	Mod	2	MODERATE	7
GVR27 – Farmstead*	NIL								
GVR28 - Farmstead	0.7	Mod	2	Mod	2	Mod	2	MODERATE	6
GVR29 - Farmstead	3.9	Low	1	Mod	2	Low	1	LOW	4
GVR30 – Farmstead*	NIL								
GVR31 - Farmstead#	4.5	Low	1	High	3	High	3	MODERATE	7
GVR32 - Farmstead#	4.4	Low	1	Low	1	Mod	2	LOW	4
GVR33 - Farmstead#	4.2	Low	1	High	3	Mod	2	MODERATE	6

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

Receptor is inside the Camden I WEF project area

^ Receptor is inside the Camden II WEF project area

The table above shows that neither of the identified sensitive receptors would experience high levels of visual impact as a result of the proposed Camden II grid connection project. One of these receptors is expected to experience only moderate levels of visual impact, while the remaining receptor is expected to experience low levels of visual impact.

Thirty-three (33) *potentially* sensitive receptor locations were identified within 5 kms of the nearest corridor alternative, six (6) of which were found to be outside the viewshed for the grid connection. Of the remaining twenty-seven receptors, twenty-one (21) are expected to experience moderate levels of visual impact resulting from the grid connection infrastructure while the remaining six (6) will only experience low levels of impact. Impacts on fourteen (14) of these receptors will however be reduced due to their location within either the Camden I WEF or Camden II WEF project areas. It has been assumed that the relevant land owners support these projects and are not expected to perceive the proposed development in a negative light.

As stated above, the N2 national route could be considered as a potentially sensitive receptor road. Elements of the WEF development are expected to be highly visible to motorists travelling along the N2, but the likely visual impacts of these elements on motorists utilising this route would depend on the location of the different elements on the site. Impacts would be also be

reduced by the level of transformation and landscape degradation present in the vicinity of Camden Power Station.

In light of this, visual impacts from the WEF development affecting the N2 are rated as moderate.

As there are no national routes or main roads within 5 kms of the grid assessment corridors, it is not anticipated that these roads will be subjected to any visual impacts as a result of the grid connection infrastructure.

8.3 Photomontages

Photomontages (visual simulations) were originally compiled in 2019 order to provide a preliminary indication of how the proposed Camden II WEF development would appear from various viewpoints within the visual assessment area. An indicative range of locations (referred to as “view points”) was selected for modelling purposes and photomontages were produced from these viewpoints (**Figure 33**). The original wind turbine layout for Camden II as provided by the Proponent in 2019 was modelled in 3D, at the correct scale, and then superimposed onto landscape photographs taken during the site visit. Although the turbine layout for Camden II WEF has since been revised, the resulting photomontages are still considered relevant as they illustrate how views from each selected viewpoint could potentially be transformed by the proposed WEF development if the wind turbines are erected within the project area as proposed.

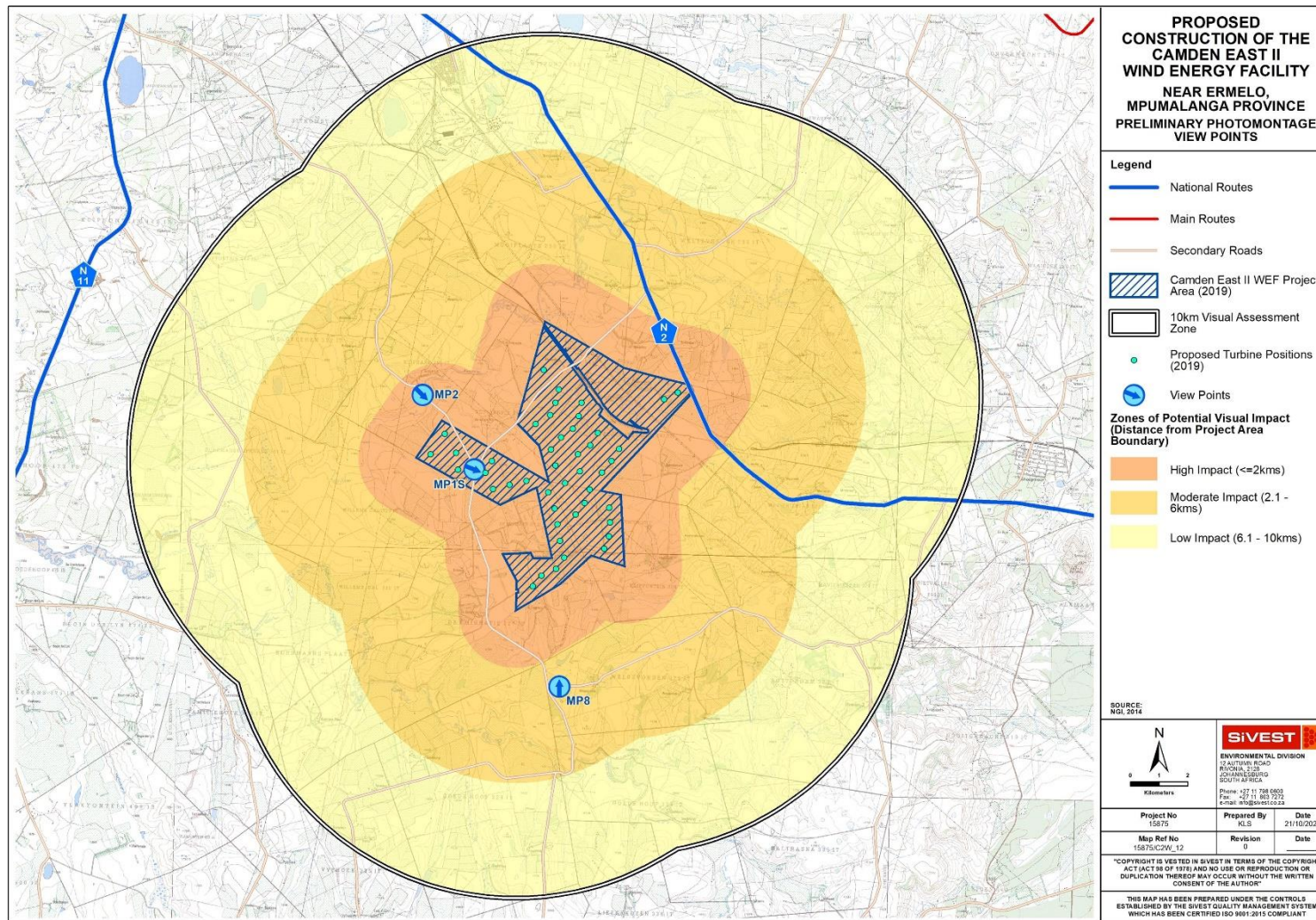


Figure 33: Photomontage viewpoints for Camden East II WEF (2019 conceptual layout)

8.3.1 Viewpoint MP1S

This viewpoint is within the Camden II WEF project area, on District Road D260. This point is approximately 575m from the nearest turbine placement in the original layout and is thus in a zone of high visual impact. Hence the turbines are highly visible from this distance.



Figure 34: View east-south-east from Viewpoint MP1S - Pre-Construction



Figure 35: View east-south-east from Viewpoint MP1S – Post Construction

8.3.2 Viewpoint MP2

This viewpoint is located on District Road D260, approximately 1.6km from the nearest turbine placement in the original layout and is thus in a zone of high visual impact. Turbines are visible from this distance, but hazy conditions tend to reduce the visibility.



Figure 36: View north from Viewpoint MP3 – Pre-Construction



Figure 37: View north from Viewpoint MP3 – Post Construction

8.3.3 Viewpoint MP8

This viewpoint is located on the secondary road to the south of the Camden II WEF project area. This point is approximately 3.7km from the nearest turbine placement and is thus in a zone of moderate visual impact. Turbines are visible from this distance, but hazy conditions tend to reduce the visibility.



Figure 38: View west-south-west from Viewpoint MP7 – Pre-Construction



Figure 39: View west-south-west from Viewpoint MP7 – Post Construction

8.4 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 wind farm at night.

Camden Power Station and the adjacent Camden residential area, as well as Mooiplaats Colliery to the north-west of the Camden II WEF project area are the main sources of light within the study area. These elements are expected to have a significant impact on the night scene in the northern sector of the study area.

Other light sources in the broader area would largely emanate from the many farmsteads dotted across the study area, and also from vehicles travelling along the national routes.

Overall, the visual character of the night environment within the study area is considered to be moderately 'polluted' and will therefore not be regarded as pristine. While the operational and security lighting required for the proposed WEF project is likely to intrude on the nightscape and create some glare, the impact of the additional lighting is expected to be reduced by the significant amount of light already present within the surrounding area at night. However, farmsteads located in areas characterised by lower levels of disturbance / transformation would be moderately sensitive to the impact of additional lighting.

Power lines and associated towers or pylons are not generally lit up at night and, thus light spill associated with the proposed grid connection infrastructure is only likely to emanate from the proposed on-site substation. Lighting from this facility is therefore expected to intrude on the nightscape to some degree. It should however be noted that the grid connection infrastructure will only be constructed if the proposed WEF is developed and thus the lighting impacts from the proposed substation would be subsumed by the glare and contrast of the lights associated with the WEF as a whole. As such, the grid connection infrastructure is not expected to result in significant lighting impacts.

8.5 Cumulative Impacts

Although it is important to assess the visual impacts of the proposed Camden II WEF specifically, it is equally important to assess the cumulative visual impact that could materialise as a result of this development. 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:

- existing and proposed mining / quarrying activities,

- electrical infrastructure including Camden Power Station and associated power lines; and
- proposed renewable energy facilities comprising the Camden Renewable Energy Complex (Wind, Solar, Hydrogen and associated grid connection infrastructure).

Existing mining / quarrying and electrical infrastructure have already resulted in large scale visual impacts, mostly along the N2 national route, extending south-eastwards from Ermelo to Camden Power Station. These developments have significantly altered the sense of place and visual character in the broader region.

Renewable energy facilities have the potential to cause large-scale visual impacts, and although the level of transformation already present in the landscape will reduce the contrast and overall visual impact of the new development, the incremental change in the landscape will be increased and the visual impacts on surrounding visual receptors would be exacerbated. Although the South African Renewable Energy EIA Application Database from DFFE does not record any existing or proposed renewable projects within 35kms of the Camden II WEF project area, a cumulative assessment must include all elements of the proposed Camden Renewable Energy Complex. This complex, including wind, solar and green hydrogen energy facilities as well as associated grid connection infrastructure, will affect a large portion of the study area.

From a visual perspective, the concentration of renewable energy facilities as proposed will further change the visual character of the area and alter the inherent sense of place, extending 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 recommended mitigation measures. In addition, it is possible that these developments in close proximity to each other could be seen as one large Renewable Energy Facility (REF) rather than several 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.

8.6 Identification of Potential Impacts

Potential visual issues / impacts resulting from the proposed Camden II WEF and associated grid connection infrastructure are outlined below. More detailed descriptions of these impacts are provided in Section **Error! Reference source not found.**

8.6.1 Construction Phase: WEF and Grid Connection Infrastructure

Nature of the impact

- Potential visual intrusion resulting from large construction vehicles and equipment;
- Potential visual effect of construction laydown areas and material stockpiles.
- Potential impacts of increased dust emissions from construction activities and related traffic;
- Potential visual scarring of the landscape as a result of site clearance and earthworks; and
- Potential visual pollution resulting from littering on the construction site

Significance of impact

The significance of visual impacts associated with the WEF during construction is expected to be **Moderate** but will be reduced to **Low** with the implementation of mitigation measures.

The significance of visual impacts associated with the grid connection infrastructure during construction is expected to be **Low** but will be further reduced with the implementation of mitigation measures.

8.6.2 Operational Phase: WEF and Grid Connection Infrastructure

Nature of the impact

- Potential alteration of the visual character of the area;
- Potential visual clutter caused by substation and other associated infrastructure on-site.
- Potential visual effect on surrounding farmsteads; and
- Potential alteration of the night time visual environment as a result of operational and security lighting as well as navigational lighting on top of the wind turbines.

Significance of impact

The significance of visual impacts during operation are expected to be **Moderate**, and although mitigation measures will result in some minor reduction of visual impacts, the degree of significance will remain **Moderate**.

The significance of visual impacts associated with the grid connection infrastructure during operation are expected to be **Low** but will be further reduced with the implementation of mitigation measures.

8.6.3 Decommissioning Phase: WEF and Grid Connection Infrastructure

Nature of the impact

- Potential visual intrusion resulting from vehicles and equipment involved in the decommissioning process;
- Potential impacts of increased dust emissions from decommissioning activities and related traffic;
- Potential visual scarring of the landscape as a result of decommissioning activities; and
- Potential visual intrusion of any remaining infrastructure on the site.

Significance of impact

The significance of visual impacts associated with the WEF during decommissioning is expected to be **Moderate** but will be reduced to **Low** with the implementation of mitigation measures.

The significance of visual impacts associated with the grid connection infrastructure during decommissioning is expected to be **Low** but will be further reduced with the implementation of mitigation measures.

8.6.4 Cumulative Impacts: WEF and Grid Connection Infrastructure

Nature of the impact

- Combined visual impacts from mining, industrial, infrastructural and renewable energy development in the broader area could potentially alter the sense of place and visual character of the area; and
- Combined visual impacts from mining, industrial, infrastructural and renewable energy development in the broader area could potentially exacerbate visual impacts on visual receptors.

Significance of impact

The significance of cumulative visual impacts are potentially **High**, but could be reduced to **Moderate** with the implementation of mitigation measures.

9 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. The tables below present the impact matrix for visual impacts associated with the proposed construction and operation of the Camden II WEF and the associated grid connection infrastructure. Preliminary mitigation measures have been determined based on best practice and literature reviews.

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

9.1 Camden II WEF

9.1.1 Construction Phase Impact Rating

Table 7: Impact Rating for Camden II WEF during the construction phase

CONSTRUCTION PHASE: DIRECT IMPACTS																			
Impact number	Aspect	Description	Stage	Character	Ease of Mitigation	Pre-Mitigation							Post-Mitigation						
						(M+	E+	R+	D)x	P=	S	Rating	(M+	E+	R+	D)x	P=	S	Rating
Impact 1:	Visual impacts	<ul style="list-style-type: none">▪ Large construction vehicles, equipment and construction material stockpiles 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.▪ 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.▪ 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 resulting in visual scarring of the landscape and increasing the level of visual contrast with the surrounding environment.▪ Potential visual pollution resulting from littering on the construction site.	Construction	Negative	Moderate	3	2	3	4	3	40	N3	2	2	3	2	2	18	N2
Significance						N3- Moderate							N2 - Low						

9.1.2 Construction Phase Mitigation Measures

- Carefully plan to minimise the construction period and avoid construction delays.
- Where possible, restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.
- Inform receptors within 1km of the WEF development area of the construction programme and schedules.
- Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.
- Maintain a neat construction site by removing rubble, litter and waste materials regularly.
- Position storage / stockpile areas in unobtrusive positions in the landscape, where possible.
- 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;
 - in all areas where vegetation clearing has taken place;
 - on all soil stockpiles.

9.1.3 Operational Phase Impact Rating

Table 8: Impact Rating for Camden II WEF during the operational phase

OPERATION PHASE: DIRECT IMPACTS																			
Impact number	Aspect	Description	Stage	Character	Ease of Mitigation	Pre-Mitigation							Post-Mitigation						
						(M+	E+	R+	D)x	P=	S	Rating	(M+	E+	R+	D)x	P=	S	Rating
Impact 1:	Visual impacts	<ul style="list-style-type: none">The development may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings.The proposed WEF and associated infrastructure will alter the visual character of the surrounding area and expose potentially sensitive visual receptor locations to visual impacts.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 WEF.	Operation	Negative	Moderate	3	3	3	4	4	52	N3	3	3	3	4	4	52	N3
Significance						N3- Moderate							N3 - Moderate						

9.1.4 Operational Phase Mitigation Measures

- Turbine colours should adhere to CAA requirements. Bright colours and logos on the turbines should be kept to a minimum.
- Inoperative turbines should be repaired promptly, as they are considered more visually appealing when the blades are rotating (or at work) (Vissering, 2011).
- If turbines need to be replaced for any reason, they should be replaced with turbines of similar height and scale to lessen the visual impact.
- As far as possible, limit the number of maintenance vehicles which are allowed to access the site.
- Ensure that dust suppression techniques are implemented on all gravel access roads.
- As far as possible, limit the amount of security and operational lighting present on site whilst adhering to relevant safety standards.
- 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 whilst adhering to relevant safety standards.
- 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.
- Where possible, the operation and maintenance buildings should be consolidated to reduce visual clutter.
- Non-reflective surfaces should be used where possible.

9.1.5 Decommissioning Phase Impact Rating

Table 9: Impact Rating for Camden II WEF during the decommissioning phase

DECOMMISSIONING PHASE: DIRECT IMPACTS																			
Impact number	Aspect	Description	Stage	Character	Ease of Mitigation	Pre-Mitigation							Post-Mitigation						
						(M+	E+	R+	D)x	P=	S	Rating	(M+	E+	R+	D)x	P=	S	Rating
Impact 1:	Visual impacts	<ul style="list-style-type: none">▪ Vehicles and equipment required for decommissioning will alter the natural character of the study area and expose visual receptors to visual impacts.▪ 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 construction would expose bare soil resulting in visual scarring of the landscape and increasing the level of visual 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.	Decommissioning	Negative	Moderate	3	2	3	4	3	40	N3	2	2	3	2	2	18	N2
Significance						N3- Moderate							N2 - Low						

9.1.6 Decommissioning Phase Mitigation Measures

- All infrastructure that is not required for post-decommissioning use should be removed.
- Carefully plan to minimize the decommissioning period and avoid delays.
- Maintain a neat decommissioning site by removing rubble and waste materials regularly.
- Position storage / stockpile areas in unobtrusive positions in the landscape, where possible.
- Ensure that dust suppression procedures are maintained on all gravel access roads throughout the decommissioning phase.
- All cleared areas should be rehabilitated as soon as possible.
- Rehabilitated areas should be monitored post-decommissioning and remedial actions implemented as required in compliance with the regulatory requirements at the time of decommissioning.

9.1.7 Cumulative Impact Rating

Table 10: Cumulative Impact Rating for Camden II WEF

CUMULATIVE IMPACTS																			
Impact number	Aspect	Description	Stage	Character	Ease of Mitigation	Pre-Mitigation							Post-Mitigation						
						(M+	E+	R+	D)x	P=	S	Rating	(M+	E+	R+	D)x	P=	S	Rating
Impact 1:	Visual impacts	<ul style="list-style-type: none">Additional renewable energy 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.	All stages	Negative	Moderate	5	3	3	5	4	64	N4	4	3	3	4	4	56	N3
Significance						N4- High							N3 - Moderate						

9.1.8 Cumulative Impact Mitigation Measures

- Carefully plan to minimise the construction period and avoid construction delays.
- Position laydown areas and related storage/stockpile areas in unobtrusive positions in the landscape, where possible.
- Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.
- Where possible, the operation and maintenance buildings should be consolidated to reduce visual clutter.
- As far as possible, limit the number of maintenance vehicles which are allowed to access the facility.
- Ensure that dust suppression techniques are implemented on all gravel access roads.
- As far as possible, limit the amount of security and operational lighting present on site whilst adhering to relevant safety standards.
- 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 whilst adhering to relevant safety standards.
- 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.

9.2 Camden II WEF Grid Connection Infrastructure

9.2.1 Construction Phase Impact Rating

Table 11: Impact Rating for Camden II WEF 132kV Grid Connection Infrastructure during the construction phase

CONSTRUCTION PHASE: DIRECT IMPACTS																			
Impact number	Aspect	Description	Stage	Character	Ease of Mitigation	Pre-Mitigation							Post-Mitigation						
						(M+	E+	R+	D)x	P=	S	Rating	(M+	E+	R+	D)x	P=	S	Rating
Impact 1:	Visual impacts	<ul style="list-style-type: none">▪ Large construction vehicles, equipment and construction material stockpiles 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.▪ 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.▪ 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 resulting in visual scarring of the landscape and increasing the level of visual contrast with the surrounding environment.▪ Potential visual pollution resulting from littering on the construction site.	Construction	Negative	Moderate	3	2	3	2	2	30	N2	2	2	3	2	2	18	N2
Significance						N2- Low							N2 - Low						

9.2.2 Construction Phase Mitigation Measures

- Carefully plan to minimise the construction period and avoid construction delays.
- Inform receptors within 500m of the proposed power line and / or substation of the construction programme and schedules;
- Make use of existing gravel access roads where possible.
- Limit the number of vehicles and trucks travelling to and from the proposed sites, where possible.
- Ensure that dust suppression techniques are implemented:
 - on all access roads;
 - in all areas where vegetation clearing has taken place;
 - on all soil stockpiles.
- Maintain a neat construction site by removing litter, rubble and waste materials regularly.

9.2.3 Operational Phase Impact Rating

Table 12: Impact Rating for Camden II WEF 132kV Grid Connection Infrastructure during the operational phase

OPERATIONAL PHASE: DIRECT IMPACTS																			
Impact number	Aspect	Description	Stage	Character	Ease of Mitigation	Pre-Mitigation							Post-Mitigation						
						(M+	E+	R+	D)x	P=	S	Rating	(M+	E+	R+	D)x	P=	S	Rating
Impact 1:	Visual impacts	<ul style="list-style-type: none">The proposed power line and substation could alter the visual character of the surrounding area and expose sensitive visual receptor locations to visual impacts.The proposed development will alter the visual character of the surrounding area and expose potentially sensitive visual receptor locations to visual impacts.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 could be altered as a result of operational and security lighting at the proposed substation.	Operation	Negative	Moderate	2	3	3	4	2	24	N2	2	3	3	4	2	24	N2
Significance						N2- Low							N2 - Low						

9.2.4 Operational Phase Mitigation Measures

- Where possible, limit the number of maintenance vehicles using access roads.
- Ensure that dust suppression techniques are implemented on all gravel access roads.
- As far as possible, limit the amount of security and operational lighting present on the substation site whilst adhering to relevant safety standards.
- 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 whilst adhering to relevant safety standards.
- 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.
- Non-reflective surfaces should be used where possible.

9.2.5 Decommissioning Phase Impact Rating

Table 13: Impact Rating for Camden II WEF 132kV Grid Connection Infrastructure during the decommissioning phase

DECOMMISSIONING PHASE: DIRECT IMPACTS																			
Impact number	Aspect	Description	Stage	Character	Ease of Mitigation	Pre-Mitigation							Post-Mitigation						
						(M+	E+	R+	D)x	P=	S	Rating	(M+	E+	R+	D)x	P=	S	Rating
Impact 1:	Visual impacts	<ul style="list-style-type: none">▪ Vehicles and equipment required for decommissioning will alter the natural character of the study area and expose visual receptors to visual impacts.▪ 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 construction would expose bare soil resulting in visual scarring of the landscape and increasing the level of visual 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.	Decommissioning	Negative	Moderate	3	2	3	2	2	30	N2	2	2	3	2	2	18	N2
Significance						N2- Low							N2 - Low						

9.2.6 Decommissioning Phase Mitigation Measures

- All infrastructure that is not required for post-decommissioning use should be removed.
- Carefully plan to minimize the decommissioning period and avoid delays.
- Maintain a neat decommissioning site by removing rubble and waste materials regularly.
- Position storage / stockpile areas in unobtrusive positions in the landscape, where possible.
- Ensure that dust suppression procedures are maintained on all gravel access roads throughout the decommissioning phase.
- All cleared areas should be rehabilitated as soon as possible.
- Rehabilitated areas should be monitored post-decommissioning and remedial actions implemented as required in compliance with the regulatory requirements at the time of decommissioning.

9.2.7 Cumulative Impact Rating

Table 14: Cumulative Impact Rating for Camden II WEF 132kV Grid Connection Infrastructure

CUMULATIVE IMPACTS																			
Impact number	Aspect	Description	Stage	Character	Ease of Mitigation	Pre-Mitigation							Post-Mitigation						
						(M+	E+	R+	D)x	P=	S	Rating	(M+	E+	R+	D)x	P=	S	Rating
Impact 1:	Visual impacts	<ul style="list-style-type: none">Additional renewable energy and associated 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 and associated infrastructure 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.	All stages	Negative	Moderate	5	3	3	5	4	64	N4	4	3	3	4	4	56	N3
Significance						N4- High							N3 - Moderate						

9.2.8 Cumulative Impact Mitigation Measures

- Where possible, limit the number of maintenance vehicles using access roads.
- Non-reflective surfaces should be utilised where possible.
- Where possible, limit the amount of security and operational lighting present at the on-site substation.
- Light fittings for security at night should reflect the light toward the ground and prevent light spill.

10 COMPARATIVE ASSESSMENT OF ALTERNATIVES

A comparative assessment has been undertaken in respect of the design and layout alternatives put forward for the EIA phase of the Camden II WEF and associated grid connection infrastructure. The aim of the comparative assessment is to determine which of the alternatives would be preferred from a visual perspective. Preference ratings for each alternative have been based on the following factors:

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

The alternatives are rated as preferred; favourable, least-preferred or no-preference described in **Table 15** below.

Table 15: Description of preference ratings applied to alternatives

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

Detailed comparative assessment tables for each sub-project are provided in **Appendix D**. Summaries of the findings are however provided below.

10.1 Camden II WEF: Infrastructure Alternatives

The EIA Phase design and layout proposals for Camden II WEF include include two site alternatives for the Substation / BESS, three site alternatives for the construction camp and four site alternatives for the temporary laydown area (**Figure 4**).

No fatal flaws were identified for any of the proposed site alternatives for the substation / BESS, laydown areas and construction camps for Camden II WEF. A summary of the preference ratings for each infrastructural element is provided below.

- Substation / BESS: No preference was determined for any of the site alternatives and both alternatives were found to be favourable.
- Temporary Construction Laydown Area: No preference was determined for any of the site alternatives and all alternatives were found to be favourable.
- Temporary Construction Camp / Cement Batching Plant: No preference was determined for any of the site alternatives and all alternatives were found to be favourable.

10.2 Camden II WEF: 132kV Grid Connection Alternatives

Two substation alternatives with four associated route alternatives are being assessed for the proposed Camden II WEF 132kV Grid Connection (**Figure 5**):

No fatal flaws were identified for either of the proposed substation site alternatives or the proposed grid connection alternatives. A summary of the preference ratings for each infrastructural element is provided below.

- Substation: No preference was determined for either of the site alternatives and both alternatives were found to be favourable.
- Grid Connection Corridors: No preference was determined for any of the corridor alternatives and all four alternatives were found to be favourable.

10.3 No-Go Alternative

The 'no-go' alternative is the option of not undertaking the proposed project. Hence, if the 'no-go' option is implemented, there would be no development. The area would thus retain its visual character and sense of place and no visual impacts would be experienced by any locally occurring receptors.

11 REVISED LAYOUT

Subsequent to the completion of all specialist studies, the Proponent has refined the proposed Camden II WEF layout in line with the recommendations of the various specialists. The refined layout as shown in **Figure 4** has been assessed from a visual perspective and it has been concluded that these amendments do not change the findings of this VIA.

12 CONCLUSION

A combined visual study was conducted to assess the magnitude and significance of the potential visual impacts associated with the development of the proposed Camden II WEF and associated grid connection infrastructure near Ermelo in Mpumalanga Province. The VIA has demonstrated that the study area has a somewhat mixed visual character, transitioning from the heavily transformed urban / industrial landscape associated with Camden Power Station, Camden residential area and Mooiplaats Colliery in the north to a more rural / pastoral character across the remainder of the study area. Hence, although a WEF and power line development would alter the visual character and contrast with this rural / pastoral character, the location of the proposed WEF and grid connection infrastructure in relatively close proximity to Camden Power Station and the associated power lines, mining activity and rail infrastructure will significantly reduce the level of contrast.

A broad-scale assessment of visual 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 to moderate** visual sensitivity. However, 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.

One formal protected area (Langcarel Private Nature Reserve) was identified within the study area, although the area is entirely managed for commercial agriculture with no conservation activities present and no evidence of public access to the site. Any landscape value or visual appeal has therefore been reduced. The area is not typically valued for its tourism significance and relatively few leisure-based tourism facilities (lodges/accommodation facilities) were identified inside the study area. This factor in conjunction with the high levels of transformation in the north have reduced the overall visual sensitivity of the broader area.

Wind Energy Facility: Receptor Identification

A total of five (5) sensitive receptors were identified in the study area, three (3) of which are considered to be sensitive receptors as they are linked to leisure/nature-based tourism activities in the area. None of these receptors are however expected to experience high levels of visual impact from the proposed WEF facility. An additional fourteen (14) receptors were identified within 2km of the proposed WEF development, all of which appear to be farmsteads that could be regarded as potentially sensitive visual receptors as the proposed development will likely alter vistas experienced from these locations. Five (5) of these farmsteads are however located within the Camden II WEF project area and it has been confirmed by the Proponent that the relevant land owners are in support of the overall Camden Renewable Energy Complex project. As such, they are not expected to perceive the proposed development in a negative light and this would reduce the level of visual impact experienced at these locations. Two (2) potentially sensitive receptors are expected to experience high levels of visual impact as a result of the proposed development, while the remaining seven (7) will experience moderate levels of visual impact.

Electrical Grid Infrastructure: Receptor Identification

Two (2) sensitive receptors were identified within 5 km of the nearest grid corridor alternative, although neither of these would experience high levels of visual impact as a result of the proposed Camden II grid connection project. One of these receptors is expected to experience only moderate levels of visual impact, while the remaining receptor is expected to experience low levels of visual impact.

A total of thirty-three (33) *potentially* sensitive receptor locations were identified within 5 kms of the nearest corridor alternative, six (6) of which were found to be outside the viewshed for the grid connection. Of the remaining twenty-seven receptors, twenty-one (21) are expected to experience moderate levels of visual impact resulting from the grid connection infrastructure while the remaining six (6) will only experience low levels of impact. Impacts on fourteen (14) of these receptors will however be reduced due to their location within either the Camden I WEF or Camden II WEF project areas. It is known that the relevant land owners support these projects and are not expected to perceive the proposed development in a negative light.

Although the N2 road traverses the study area, motorists travelling along this route are only expected to experience moderate impacts from the proposed Camden II WEF. As there are no national routes or main roads within 5 kms of the grid assessment corridors, it is not anticipated that these roads will be subjected to any visual impacts as a result of the grid connection infrastructure.

A preliminary assessment of overall impacts revealed that impacts associated with all the proposed Camden II WEF and associated grid connection infrastructure (post mitigation) are of low significance during both construction and decommissioning phases. During operation however, visual impacts (post mitigation) from the Camden II WEF would be of moderate significance with relatively few mitigation measures available to reduce the visual impact. Visual impacts associated with the Camden II WEF 132kV Grid Connection project during operation would be of low significance.

Considering the presence of existing and proposed mining activity and electrical generation and distribution infrastructure, the introduction of new renewable energy facilities in the area will result in further change in the visual character of the area and alteration of the inherent sense of place, extending 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 recommended mitigation measures. In light of this, cumulative impacts have been rated as medium.

A comparative assessment of site alternatives for the on-site WEF infrastructure and also for the grid connection alternatives was undertaken in order to determine which of the alternatives would be preferred from a visual perspective. No fatal flaws were identified in respect of any of the alternatives for the proposed on-site substation / BESS facilities, temporary construction laydown area and temporary construction camp / cement batching plant and all alternatives were found to be favourable.

No fatal flaws were identified for either of the substation alternatives or any of the grid connection infrastructure alternatives. No preference was determined for any of the grid connection alternatives and both substation site alternatives and all four Power Line Corridor Alternatives were found to be favourable.

12.1 Visual Impact Statement

It is SiVEST's opinion that the potential visual impacts associated with the proposed Camden II WEF and the associated grid connection infrastructure are negative and of moderate significance. Given the relatively low number of sensitive receptors and the significant level of human transformation and landscape degradation in areas near the proposed development, the respective projects are deemed acceptable from a visual perspective and the EAs should be granted. SiVEST is of the opinion that the 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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