PROPOSED CONSTRUCTION OF A 132KV TRANSMISSION LINE FROM DE AAR NORTH WEF SUBSTATION TO HYDRA SUBSTATION, DE AAR, NORTHERN CAPE

Longyuan Mulilo De Aar 2 North Wind Energy Facility

DEA REF NR:

Visual Impact Assessment

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On behalf of
Longyuan Mulilo De Aar 2 North Pty Ltd (for LM DA 2 North WEF)
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March 2014

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Visual Impact Assessment

CONTENTS:

FIGURES

TABLES

Abbreviations used in the Report:

Asl : above sea level.
WEF: Wind Energy Facility SEF: Solar Energy Facility

Glossary:
Farmstead is the building, or group of buildings where people may live, not the whole farm.

Bibliography:

Understanding the Characteristics of Powerlines. National Grid, UK
Visual Representation of Wind Farms, Good Practice Guidance, SNH, 2007
Design of Wind Farms in the Landscape 2009, SNH, Scotland
Guidelines on the Environmental Impact of Wind Farms and Small Scale Hydroelectric Schemes, Scottish Natural Heritage, 2001 and their revisions and amendments relating to powerlines only, published in 2009.
Guidelines for Landscape and Visual Impact Assessment, (GLVIA). 3rd Ed, LI UK 2012

EXECUTIVE SUMMARY

This Visual Impact Assessment Report was originally undertaken during the months of December 2012 and January 2013; and this current study, dealing with an amendment to the route previously assessed was undertaken during March 2014.

It assesses a proposal by Longyuan Mulilo De Aar 2 North Pty Ltd (for LM DA 2 North WEF), to establish a 132kV Transmission Line on a route to the north-east of De Aar. The need for the new transmission line is as a response to the proposed WEF on the Eastern Plateau, (De Aar 2 North), which will require new substations for connectivity to the grid. The generated power would be evacuated from the WEF substation direct to the existing Eskom substation, Hydra. The location of the proposed servitude and the design of the towers/masts are the subject of the report, not the substations.

The servitude width is proposed to be 31m and the towers are proposed to be of the steel monopole design, with side arms. The route runs in parallel for much of its length with an existing 400kV transmission line; the servitude would in that case be 52m, the assessed corridor, 500m.

This project would be executed on land currently mainly used for agriculture and transmission lines. The site is also relatively close to some farmsteads, and a freight rail line. The servitude does not appear to have cultural significance. The major centre of local habitation, De Aar, is not visually impacted upon.

The Preferred and an Alternative route were assessed and the No-Go alternative. The zone of visual influence extends up to 2.5km from the route.

This proposal would provide land uses very similar to existing uses close to the proposed servitude, and to uses in the immediate locality. The tower design is different from those used locally at present, and while it could be considered to be somewhat more visible in close proximity, it is technically more appropriate and it has a smaller footprint.

Visual Impact Rating:
The visual impact would be rated as low; during the operational phase receptors could become habituated to the additional transmission servitude.

Visual Sensitivity Issues:
The sensitivity of the landscapes along the route is assessed as low since the landscape is contextualised by transmission lines and can thus accommodate additional transmission lines with careful planning.

Recommendations
It is recommended therefore that from a visual perspective, the proposed construction of one 132kV transmission line from De Aar 2 North to Eskom Hydra substation should proceed on the preferred route, and the agreed mitigation measures are undertaken relating to the:

5.3.1 to 5.3.3 Construction Phase and provision of an Environmental Management Plan.
5.3.4 Layout of the route

1.0 INTRODUCTION

1.1 Background Context:

Longyuan Mulilo De Aar 2 North Pty Ltd (for LM DA 2 North WEF) (**LM**), proposes to construct one 132kV overhead transmission line on land to the west of the Eastern Plateau and to the east of the town of De Aar, Northern Cape.

This is proposed in order to connect 140MW Wind Energy Facilities (South & North); (South: DEA REF. NO. 12/12/20/2463/1, North: DEA REF. NO. 12/12/20/2463/2) to be developed to the north-east of De Aar, Northern Cape, to the national transmission grid via the existing Hydra substation, (Refer to Figures 1.1 and 2.1 for locality maps).
(Source: Aurecon).

This Assessment refers to the transmission lines only, not to the substations.

Aurecon South Africa (Pty) Ltd (Aurecon) has been appointed to undertake the requisite environmental process as required in terms of the National Environmental Management Act (No. 107 of 1998), as amended, on behalf of **LM**.

The proposed project would take place on land zoned for Agriculture and owned by a number of different farming entities.

Aurecon has commissioned Karen Hansen, Landscape Architect, and an independent Visual Impact Assessment practitioner, to provide this Visual Impact Assessment for the project. K Hansen's CV and experience are listed in Addendum 4.

Figure 1.1: Location of **De Aar** in Northern Cape Province, in relation to Cape Town in the Western Cape. Source: Google mapping.

1.2 Terms of Reference

The proposed ToR for this Visual Impact Assessment is as follows:

- Source and review baseline information from earlier studies
- Analysis of applicable information
- Prepare a full Visual Impact Assessment to include the proposed transmission line routes at De Aar 2
    - Identify issues raised relating to visual, aesthetic and scenic resources through any existing reports, baseline studies and framework plans, any public scoping phase, and site visits. The study must take into account the expected community response as well as the applicable South African standards.
    - Describe the receiving environment and the proposed project in terms of landscape types, landscape character and land use patterns.
    - Describe the sense of place and contributing factors (spatial and non-spatial).
    - Establish the view catchment area, view corridors, viewpoints and receptors
    - Determine the relative visibility or visual intrusion of the proposed project
    - Determine the relative compatibility or conflict of the project with the surrounding land uses in terms of visibility.
    - Determine significant/sensitive receptors.
    - Indicate potential visual impacts using established criteria and including:
        - Consideration of impacts at the construction phase
        - Consideration of cumulative impacts potentially arising from the various renewable energy projects in the area
    - Describe alternatives, mitigation measures and monitoring programs
    - Describe the opportunities and constraints of the alternatives
    - Use mapping and photo-montage techniques as appropriate.

In terms of evaluation criteria, use the criteria specific for Visual Impact Assessments listed in the Department of Environmental Affairs and Development Planning guideline document "Guideline for involving visual and aesthetic specialists in EIA processes".

1.3 Methodology

1.3.1 The following sequence of work was employed in this report:
A desktop survey using 1:50,000 topographical survey maps to assess the servitude setting, to identify landform, landscape and habitation patterns and assess the viewshed. Aerial photography, Google Earth, was used to assist in this part of the study. Global Mapper, a software tool for spatial and terrain analysis was used to start the visual envelope definition process. Adobe photoshop and CAD software were used to manipulate some images to test the visual effect of the proposed infrastructure.

1.3.2 Written and Drawn Material was made available by Aurecon:

- Terms of Reference for the Study
- Email dated 22/11/2012 including Google earth based location plans
- Annexure B Property Description 22-11-2012.docx
- Electrical Layout De Aar NorthWEF.kmz
- Electrical Layout De Aar South WEF.kmz

- Project description De Aar 2 Rev 1.docx
- De Aar 1 sub loc and 132kV route (2014-01-28).kmz
- De Aar 2 sub loc and 132kV route (2014-01-28).kmz
- De Aar 2 North WEF – Revised 25 March 2014.kmz
- Email dated 28/02/2014 including Google earth based location plans
- Further emails containing clarification of issues.

Background research from earlier studies assessing proposed transmission infrastructure around De Aar has also been referred to.
All of the above was used as source reference material.

1.3.3 The receiving servitude was assessed, and also areas of the locality from where it appeared to be likely to be visible; the site visit was undertaken 12th December 2012.

- This first study was conducted during the months of December 2012 and January 2013; and this current study, dealing with an amendment to the route previously assessed was undertaken during March 2014.
- A photographic survey of the servitude and parts of the surrounding areas was carried out; this determined the extent of the visibility of the infrastructure.
- The visual impacts were evaluated using standard criteria such as geographic viewsheds and viewing distances as well as qualitative criteria such as compatibility with the existing landscape character and settlement pattern; referring to The Guidelines, Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning, June 2005.
- Potentially sensitive areas were assessed. Mitigation measures were evaluated.

1.3.4 Determination of the Theoretical Viewshed
The theoretical viewshed has been determined in two ways for this study. First the locality has been thoroughly explored in publicly accessible areas and photographed from places where the view appeared to be significant.

Secondly, Global Mapper software was used to generate a viewshed by inputting the exact position and heights of a representative sample of towers. Global Mapper is terrain analysis software and as such contains detailed information on the terrain, transportation routes and centres of habitation, but not on lesser elements in the landscape that can delineate a view, such as trees and buildings. The resulting images were useful, but the information they contained was interpreted with information gathered on site.

1.3.5 Determination of the maximum viewing distance from the proposed infrastructure appropriate for the study.
The specialist determined the maximum distance to be assessed between receptor and proposed infrastructure by:

- Using the local context of light conditions, landscape patterns and colours, to determine probable visual impact of existing pylons at known points at certain distances.
- Noting that the nature and extent of the impact varies along a linear route, the response should vary and be flexible.
- Noting the positive correlation in impact with distance from receptor.

The maximum distance from the proposed infrastructure to be assessed will be 2.5km.

1.4 Key Issues

Some of the issues relating to visual concerns arising from the assessment of the servitude and the proposed linear development will be:

- The potential visibility of the transmission lines from the surrounding terrain, residential areas, and transport corridors
- The technical specifications of all the infrastructure elements
- The ability of the landscape to absorb the linear development
- The potential negative visual impact during the construction phase
- Views under the worst (least visible) and best (most visible) weather conditions;
- The potential visual impacts during the life of the project
- The consideration of alternatives
- Possible Mitigation measures to reduce the impacts

1.5 Rating Criteria

The rating criteria which apply in this study are identified in Addendum 1 and 2. Addendum 1 lists those criteria referred to in material provided by DEA+DP and Addendum 2 lists those developed by the EAP, Aurecon Group.

1.6 Assumptions and Limitations.

The information and deductions in this report are based on information received from Aurecon Group (South Africa) (Pty) Ltd, (Cape Town), and on research by the specialist.

1.7 Alternatives

The layout and technical specification as illustrated is the Preferred Layout. Technology and Location alternatives are discussed in section 4, paragraph 4.4. The No-Go Alternative is also assessed.

2.0 PROJECT DESCRIPTION

2.1 Route of the Proposed new Transmission Line

The proposed infrastructure to be assessed in this study is a new 132kV overhead transmission line; the scheme is called De Aar North, (De Aar 2). The *preferred* route for the transmission line would start from the new WEF substation, and extend, with some changes of direction, to Hydra, an existing Eskom substation. The route would be 26.50 km. The substations are not dealt with in this study. There is also an alternative route between the same two substations.

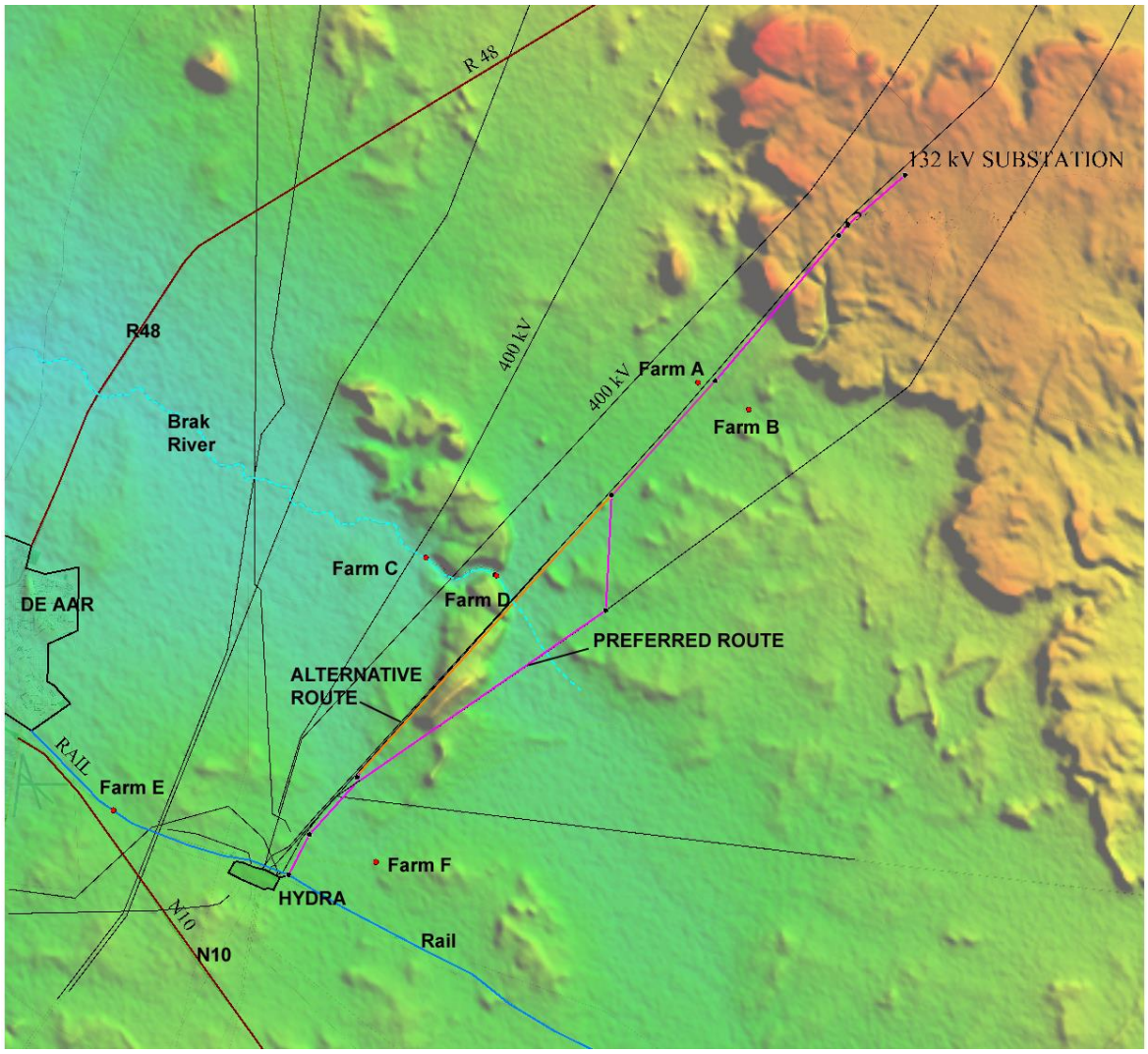

Figure 2.1: Location of the *preferred* transmission route to serve the De Aar North WEF from the WEF substation in the north-east, to Hydra substation. The *preferred* route is shown as a magenta line, the *alternative* route as an orange line; both are aligned north-east/south-west but the *preferred* is aligned south and then south west, to join a more southerly corridor. Also illustrated are De Aar, transport, (road and rail), corridors, other existing transmission lines, and the location of farmsteads. Source: Hansen.

Figure 2.2: A self-supporting structure along a straight section, with a guyed angle strained structure at each bend in the alignment. Source: Aurecon

Figure 2.3: A guyed intermediate post. Source Aurecon

2.2Tower Specification

The proposed towers are steel monopoles with side arms.

These weigh approximately 1 200 kg each and vary in height from approximately 17,4 m to 21 m. The size of the footprint depends on the type of pole, i.e. whether it is a self-supporting, guyed suspension or an angle strain pole structure. The size of the footprint ranges from 0,6 m x 0,6 m to 1,5 m x 1,5 m, with the larger footprint associated with the guyed suspension and angle strain pole used as bend/strain structures. The average span between two towers is 200 m, but can vary between 250 m and up to 375 m depending on the ground profile (topography) and the terrain to be spanned. The self-supporting structure (suspension pole) is typically used along the straight sections of the powerline, while the guyed intermediate or guyed suspension and angle strain structures are used where there is a bend in the powerline alignment.

The final tower sizes and positions will only be determined once the project has received Environmental Authorisation and after negotiations with landowners.
(Source: Aurecon brief).

There is a number of different pylon specifications used locally, and all, whether lattice or timber have a lightweight appearance which is not too visually dominant, and can be better backgrounded. The solid poles specified for this development could be more visually evident and could be absorbed less easily into the landscape, but these towers also have a smaller footprint and a technical advantage as they can support specially designed structures for certain applications whereas the lattice only has 3-4 different structure types.

2.3 Servitude width

The servitude width for a 132 kV Sub-transmission line is 31 m, (15.5 m on either side of the centre line of the powerline). Where the proposed line is aligned parallel with an existing line there would be a 21m line separation with 15.5 m either side (52m). This is ground which is kept clear. The servitude will be assessed, and also the 500m wide corridor in which these lines are located. The proposed servitude runs parallel for almost all its length with an existing 400kV line. (Source: Aurecon).

2.4 Associated infrastructure

The associated infrastructure anticipated would be access roads/tracks. Existing roads/tracks would be used for access during the construction and the maintenance periods and new 4x4 jeep tracks would be established for access to the transmission route where required. No other built form is anticipated.

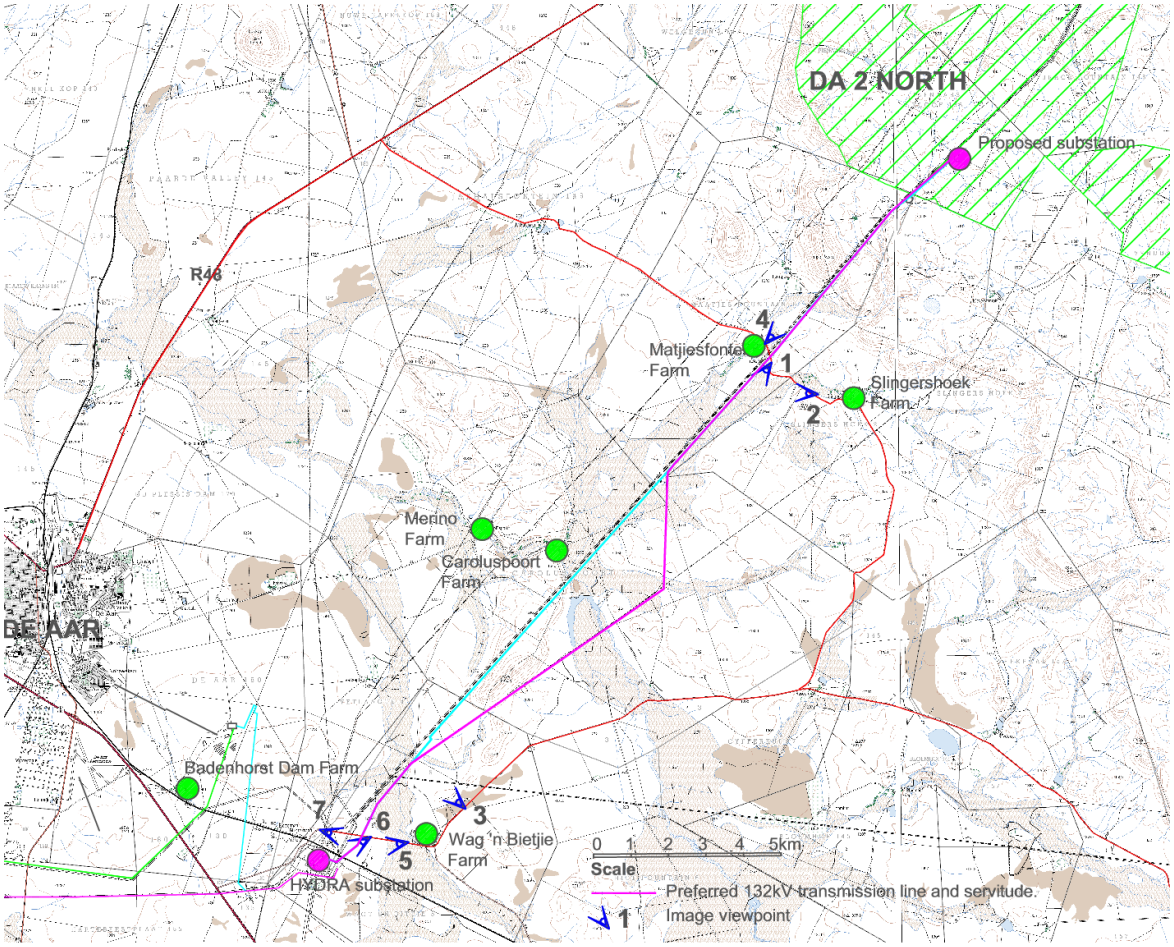

Figure 2.4: Location of the preferred 132kV transmission line in magenta; the alternative line in cyan. Illustrating the locations of the substations, farmsteads, roads, and viewpoints where images were taken. Source Hansen/CAD/1:50000 mapping, Surveyor Generals Office.

3.0 NATURE OF THE RECEIVING ENVIRONMENT

3.1 General

Landscape Character is the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and how this pattern is perceived. It reflects particular combinations of geology, landform, soils, vegetation, river systems, land use and human settlement. It creates the definite sense of place of different areas of the landscape.

3.2 Location and Routes

De Aar is located just to the north of the N10, which links Port Elizabeth on the south coast of the Eastern Cape, crossing the N1, with Upington in the north. The town is also linked north south by the R48 which goes north and east to Philipstown and south, via the R348, to Richmond on the N1. The railway radiates to all compass points; the north south route is the passenger service of ShosholozaMeyl, and Premier Classe twice a week; the route to Middelburg is mainly freight. There is an airport/aerodrome for light aircraft to the south of the N10 and close to the town.

De Aar is an important railway junction, has an aerodrome, and also a major depot for the South African Armed Services.The population is about 45,800, and the town is laid out on a grid system,on both sides of the railway junction and sidings; a line of smallholdings extends south along the R348 and there are scattered farmsteads locally. De Aar has a tourism profile focused on its connections with Olive Schreiner, and also hang gliding and para- gliding.

Recently there have been several applications for Wind Farms and Solar Photovoltaic Installations within a 25km radius of the town, and additional electricity transmission infrastructure is needed. There are two major substations located within close proximity to De Aar, namely the De Aar sub-station which is located to the north-west of the town and Hydra substation which is located south-east of the town; others are being planned.

3.3 Topography Rivers and Climate

The main geographic features defining the locality of De Aar are the wide, almost flat to undulating open spaces, big skies and sparse settlements.

Emerging from the plain are conical and ridge shaped hills and larger flatter plateaux which are intrusions of dolerite rock, and form the only vertical relief. The hills are about 100m above the plain, and the plateaux are about 250m above the plain.

There are two perennial rivers locally, the Elandsfontein running south to north, and passing De Aar to the west, and the Brak which runs from the east to the west and passes De Aar to the north.

The Northern Cape experiences semi-desert climatic conditions. De Aar is located within the low rainfall area of the Northern Cape and typically receives about 196 mm of rainfall per annum.

Approximately 45 mm are received during March. Mean temperatures range between 30ºC and 40ºC during summer months and the temperature can drop to -10ºC during winter nights.

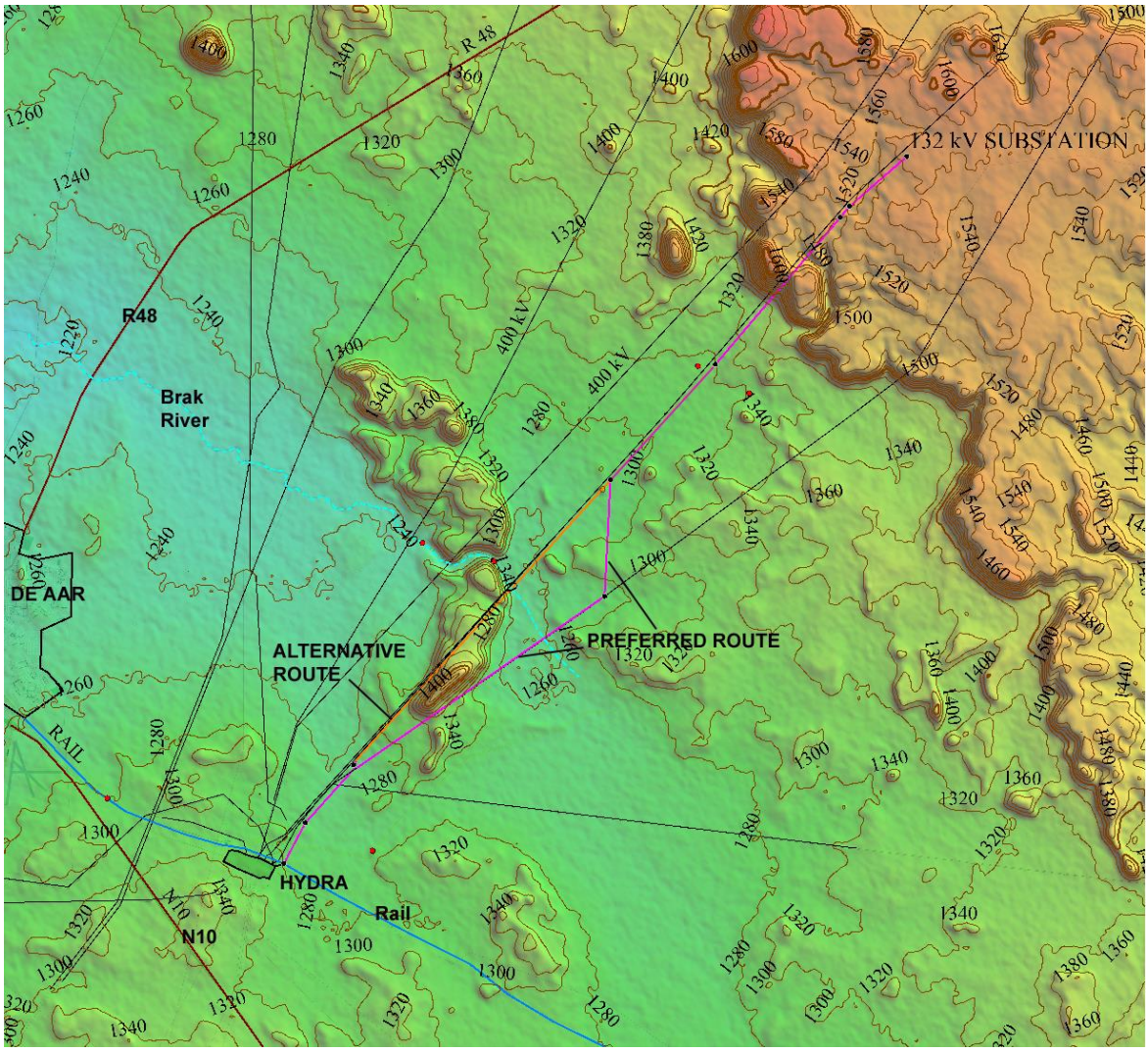

Figure 3.1: Topography: the *preferred* route commences at the WEF substation, and proceeds down a gentle valley. Then it traverses the side of a valley, over a ridge at 1517m asl., across another valley, at 1523m, then down a steep slope, 1360m, and a down a slope that becomes progressively gentle, 1311m. The *preferred* route is aligned with a seasonal watercourse, then turns south and south-west, and then crosses the Brak River at 1260m. From there the route proceeds over undulating land up to 1370m then gradually downhill to Hydra substation at 1298m asl. Source: Hansen

3.4 Natural Vegetation

The study area lies near the eastern edge of the Nama Karoo biome, which has a single mapped vegetation type namely the Northern Upper Karoo. The characteristics of vegetation in the area are mainly influenced by soil type, habitat rockiness and disturbance by man. Shrubs that rarely exceed 70 cm in height dominate the plains and the hills and mountains tend to be grassy (Source: Aurecon: BirdLife International, 2011).

There are few trees locally, only around De Aar and at farmsteads, poplar and eucalypt. The overall colour of the natural landscape is grey-green and yellow-green grasslands with grey scrub

interspersed with the pale brown roads. The scrub vegetation pattern appears uniform in colour providing visual clarity and lack of clutter.

3.5 Agriculture

The dominant land use on the lowland development site is pastoral, (sheep and cattle), along with grasslands and land that is unused.There are scattered farmsteads and the large fields are mainly defined by fencing. There are small dams fed by seasonal rainfall, and wind pumps.

3.6 Other Land Uses

Apart from housing, other land uses include: commerce, industry, agriculture, electricity transmission, and the renewable energy projects within the De Aar area that are in various stages of approval. There are several approved WEFs and SEFs, and some in earlier planning stages. There are also alternative energy schemes being constructed and additional substations and transmission lines being planned or being constructed.

3.7 Landscape Value

A landscape may be valued for many reasons, which may include landscape quality, scenic quality, tranquillity, wilderness value, consensus about its importance either nationally or locally, and other conservation interests and cultural associations.

These sites have some value for agriculture, and also have an identifiable sense of place as defined by topography, and land use.. Measured by distance from the town, the relative absence of local settlement, and similar land uses to that proposed, they would be valued as a rural area.

3.8 Landscape character

The landscape character through which the *preferred* servitude route runs starts at the plateau uplands and continues through the open land of the lowlands. Thereafter the *preferred* route follows a line down the plateau and onto open land characterised by gently undulating topography and low scrub, with long views. The land is used for agriculture and transmission lines and the character is therefore industrialised rural.

3.9 Visual significance of the area

The proposed transmission line servitude will start on the plateau where there could ultimately be a large number of wind turbines, and end where there are many other transmission lines. Therefore the rural character is in the process of gradual change to more industrial. There are visual signposts to identify the route at present from the proximity of other transmission lines the area will become more visually cluttered. The landscape is at a scale that can absorb this development.

4.0 VISUAL IMPACT ASSESSMENT

4.1 The Viewshed Envelope definition

This refers to the theoretical outer-most extent of the area from which an object, (in this case the whole servitude, may be seen. Visibility can be obscured in part or in whole by objects within the viewshed such as existing buildings, trees, or landform.

Objects can also appear to be obscured by distance, where an object can seem to blend into its background by virtue of the distance between it and the viewer.

4.1.1 Significant Issues affecting visibility:

Towers illustrated and described in section 2:

- Steel monopoles with arms, heights varying between 17.4m and 21.0m. For Assessment purposes, and because at this time the locations of the highest towers cannot be exactly identified, the maximum height specified for the towers, was used.
- Average span is 200m, but this can vary depending on servitude conditions up to 250m or 375m.
- The alignment as currently proposed.
- The other transmission lines locally.
- The numbers of receptors

4.2 View Catchment Areas

Views of greatest significance would be from transportation corridors of the N10 and the rail line, some farmsteads and from other local places of habitation and work.

The viewshed envelope would be defined by views from transport corridors, existing places of habitation and employment, and by topography.

The degree of visual influence within the View Catchment Area is judged to be moderate-low as the development would only influence the view and act as a visual focus, within a 2.5km radius, (locally).

4.3 Viewshed

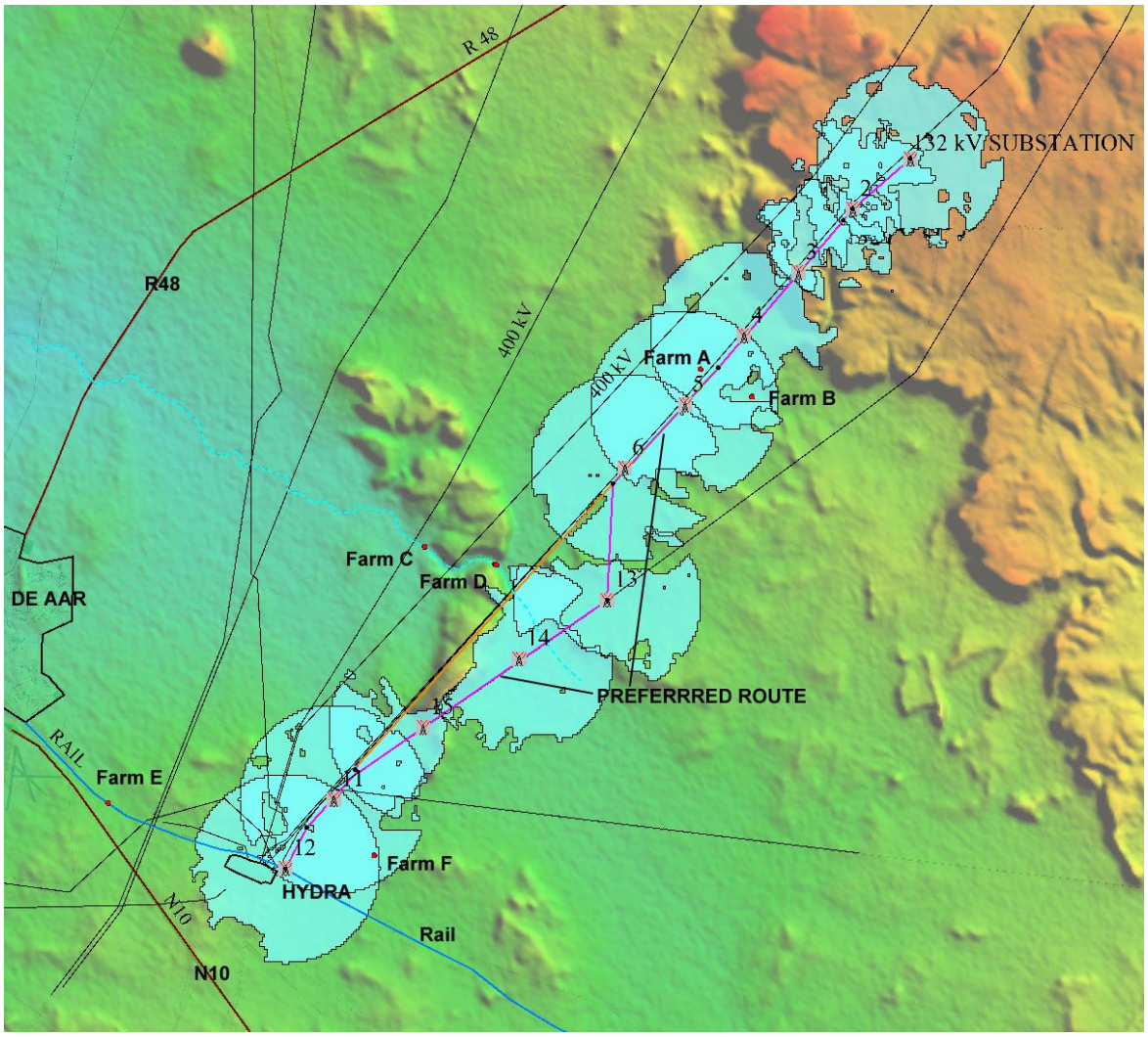

Figure 4.1: Viewsheds of the *preferred* transmission line route from the proposed WEF 132kV substation to the existing substation at Hydra, a distance of 26.5km Visual envelope calculated at a radius of 2.5km from the proposed *preferred* installation, using 21m poles and random points along the route indicating that the route and masts would be clearly visible; the selected points are shown in red. Also shows the locations of De Aar, transport corridors, and farmsteads. The visual envelope becomes somewhat broken up over higher ground, but more extensive in the plain. Source: Hansen

4.4 Alternatives

4.4.1 Technology Alternative

Technology alternative: There is currently no feasible alternative technology/ies to connect wind energy facilities to the electrical grid, therefore no alternative is assessed.

4.4.2 Location alternative

The alternative alignment does not take the more southerly route for part of the transmission servitude, but continues on the same corridor as the start and finish of the route.

4.4.3 Location alternative relative to layout and spacing

No layout alternatives can be assessed as the placement of the power line towers and any associated infrastructure will be required to be in line with the WEF technical requirements, Eskom's technical requirements, as well as with specific landowner requirements. Layout/spacing alternatives will be negotiated within the broader corridor being considered for the power lines. (Source: Aurecon)

The layout and technical specification as illustrated are the *preferred* and the *alternative* layouts. The No-Go Alternative is also assessed.

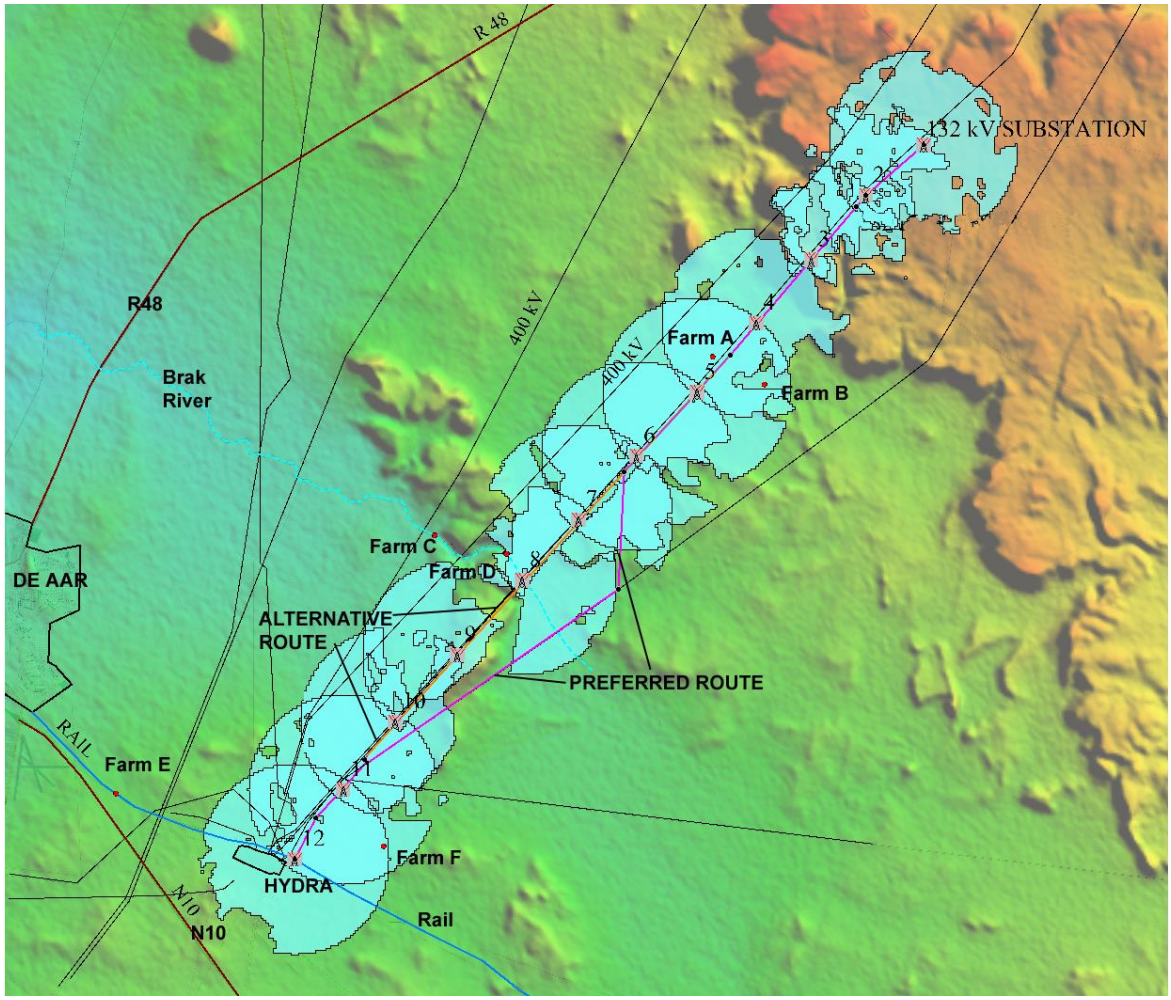

Figure 4.2: Viewsheds of the *alternative* transmission line route from the proposed WEF 132kV substation to the existing substation at Hydra, a distance of 25.6km Visual envelope calculated at a radius of 2.5km from the proposed *preferred* installation, using 21m poles and random points along the route indicating that the route and masts would be clearly visible; the selected points are shown in red. Also shows the locations of De Aar, transport corridors, and farmsteads. The visual envelope becomes somewhat broken up over higher ground, but more extensive in the plain. Source: Hansen

4.5 Visibility of the Proposed Development

4.5.1 General

As referred to in paragraph 4.2, the visibility of the proposed infrastructure up to 2.5km distance has been tested on site. Views experienced from further away became insignificant in the landscape. The degree to which the development would be visible is determined by the height of the infrastructure, its specifications, the length of the line, but is moderated by:

- distances over which these transmission lines would be seen
- weather and season conditions
- built form, trees, and terrain

Factors affecting the overall visibility of the development are the open aspect of the servitude, the surrounding land uses and land cover.

Other key issues are:
Visual effects: *The servitude is in an area of little visual clutter (current situation); more clutter will ensue following the development of renewable energy projects.*

Visual order: *The proposed infrastructure offers some visual order, but in a landscape with varying and conflicting degrees of visual order.*

Visual composition: *The proposed route offers some visual composition opportunities such as from backgrounding adjacent to the hills and higher ground.*

4.5.2 Localities from which the proposed route would be seen are:

- People walking on the hills and plateaux (recreational)
- Several Farms
- The freight rail line, (to Middelburg).

4.5.3Construction Period

The construction access would likely be off existing roads, (within the defined visual envelope). There could be large container loads over the 6 month construction period. Road haulage could be via the N10.

There will be traffic movements of heavy construction vehicles; and there may also be visible lay-down area(s) within the development servitude, visible within 1km.

4.5.4 Alternative

The visibility of the *alternative* route would be accessible to very few receptors.
No-go Alternative: As the visual envelope is defined by the edge of the transmission line servitude the visibility of the *no-go alternative* is deemed to be constant.

4.6 The Extent of the Visual Impact

Rates the impact in terms of the geographical area that will be influenced by the visual impact:

- *no impact: no visual impact*

- *site specific: on site or within 100m of the candidate site*
- *local: within a 10km radius of the candidate site*
- *regional: beyond a 10km radius of the candidate site*

4.6.1 The extent of the impact
The extent of the impact is local. The extent to which the proposed infrastructure is considered visible in clear weather conditions is taken to be 2.5km.

4.6.2 Extent varies with available light
The visual Impact is assessed in optimum weather conditions and would be reduced in poor light, (dusk and dawn) haze or dust in the air, and rain. It is anticipated that during times of less than optimum weather conditions, the extent of the visual impact could reduce to around 1.5 to 2km.

4.6.3 Extent of Impact of Alternative
The extent of the impact of the alternative route is rated local.
The extent of the impact of the *No-Go Alternative* is rated as having no impact.

4.7 Visual Exposure

Visual exposure refers to the visibility of the project site in terms of the capacity of the surrounding landscape to offer screening; such as by topography, tree cover, built form, etc.

- *no exposure: the site is hidden by topography, planting, etc*
- *low: the site is largely hidden*
- *medium: the site is partially hidden*
- *high: there is little in the surrounding landscape that can shield the development from view*

4.7.1 *Preferred* Route: Elements affecting Visual Exposure
There are no elements **on** the proposed route which affect Visual Exposure, but **beyond** the route, topography and tree planting both play a limited role.

Topography: the Eastern Plateau offers shielding and minor changes in landform in the agricultural lands may shield the tower bases from receptors.

Tree Planting and Built Form: the proposed route would be screened from farmsteads by local trees.

4.7.2 *Alternative* Route: Elements affecting Visual Exposure
There are no elements **on** the proposed route which affect Visual Exposure, but **beyond** the route, topography and tree planting both play a limited role.

Topography: the Eastern Plateau offers shielding and minor changes in landform in the agricultural lands may shield the tower bases from receptors.

Tree Planting and Built Form: the proposed route would be screened from farmsteads by local trees.

4.7.3 Conclusion

The visual exposure is rated as 'exposed', or high for the 6 months construction period, and also high for the operational period; this is because the visual exposure assessment refers primarily to the transmission line servitudes and corridors, and its surroundings, rather than to the infrastructure itself. The extent of the impact will be to the same degree for the *No-Go Alternative.*

4.8 Zones of Visual Influence

Describes the areas visually influenced by the proposed development, and assesses the amount of influence

- *non-existent: the site cannot be seen from surrounding areas*
- *low: the development is largely shielded from view by topography, planting, etc*
- *moderate: the development is partially shielded*
- *high: the development strongly influences the view and acts as a visual focus*

- People walking on the hills and plateaux (recreational).
- Several Farms
- The freight rail line, (to Middelburg).

The zones of visual influence, viewsheds, are recorded in Figure 4.1 and from it can be seen the significant areas visually affected.

4.8.1 People walking on the hills

People walking on the hills may be few in number, and if the WEF should proceed to construction, the proposed transmission lines would have comparatively significantly less impact. Receptors would however, in certain areas, be visually aware.

The zone of visual influence is therefore assessed as low and to comparatively few people.

4.8.2 The Farmsteads

Farm A: Matjiesfontein Farm; dwellings and places of work. At an elevation of 1297m, at a distance of 320m from the proposed line at 1297m. There would be a clear view of the proposal but it would be seen in context with other transmission lines. People working in the wider local area would also be significant receptors for all of whom the zone of visual influence would be moderate.

Farm B: Slingershoek Farm; dwellings and places of work. At an elevation of 1320m at a distance of 2.5km from the proposed line at 1300 to 1300m. There would not be a clear view of the proposed line as it would be partly shielded by topography. People working in the local area would also be considered to be significant receptors for all of whom the zone of visual influence would be low.

Farm C: Merino Farm; dwellings and places of work. At an elevation of 1250m, at a distance of over 4km from the *preferred* line and 2.6km from the *alternative* line at 1300m. There would not be a clear view of the proposed line as it would be partly shielded by topography. People

working in the local area would also be considered to be significant receptors for whom the zone of visual influence would be low.

Farm D: Caroluspoort Farm: dwellings and places of work. At an elevation of 1257, at a distance of just over 2.5km from the *preferred* line and 880m from the *alternative* line at 1257m. There would be a clear view of the proposal but it would be seen in context with other transmission lines. People working in the local area would also be considered to be significant receptors for all of whom the zone of visual influence would be low.

Farm E: Badenhorstdam Farm: dwellings and places of work. At an elevation of 1283, at a distance of4.8km from the *preferred* line at 1286m. There would not be a clear view of the proposal due to distance. People working in the local area would also be considered to be significant receptors for all of whom the zone of visual influence would be non-existent.

Farm F: Wag 'n Bietjie Farm: dwellings and places of work. At an elevation of 1275, at a distance of 1.8km from the *preferred* line at 1268m. There would be a view of the proposal but it would be seen in context with other transmission lines. People working in the local area would also be considered to be significant receptors for all of whom the zone of visual influence would be low.

The zone of visual influence for the farmsteads is assessed as low.

4.8.3 The Freight rail line to Middelburg.
This rail line serves freight only; the proposed transmission line would be seen by personnel operating the train, but the view would be in context with many other transmission lines.

The zone of visual influence is assessed as non-existent due to context.

4.8.4 The Construction Phase
During this phase the roads selected for the transport of the construction materials and the infrastructure components would be visually impacted upon. The zone of visual influence is assessed as moderate-low. The location of lay-down areas may be visible locally.

4.8.5 Alternatives
The *preferred* alignment is further from affected farmsteads.
The visibility of the N*o-Go Alternative* is non-existent.

4.9 Visual Absorption Capacity

This refers to the ability of the surrounding area to visually absorb the development. In this assessment, high is a positive and low is a negative.

- *low: the area cannot visually absorb the development*
- *medium: the area can absorb the development to a degree but it will look somewhat out of place*
- *high: the area can easily visually absorb the development*

4.9.1 The *preferred* alignments traversing the higher ground of the Plateau.
Would be seen in association with a WEF and would be backgrounded as seen against the hill.

Therefore the visual absorption capacity is rated high.

4.9.2 The *preferred* alignments traversing the lower ground between the plateau and De Aar
Would be seen in association with several other transmission lines of different pylon specifications.

Therefore the visual absorption capacity is rated high.

4.9.3 Alternative
For the *alternative* layout the visual absorption capacity is rated high, (the area could absorb this development) and it would not look out of place in this landscape.
For the *No-Go Alternative* the visual absorption capacity is high because the status quo would not change.

4.10 Compatibility with Surrounding Landscape

This refers to the extent to which the proposed development and land usage is in line with the surrounding development and land usage.

- *appropriate: the development will fit in well with the surrounding landscape*
- *moderately appropriate: the development can blend in, but to a lesser degree and only with care*
- *inappropriate: the development introduces new elements into the landscape that do not fit in.*

4.10.1 The *preferred* route as it traverses the higher ground of the Plateau
This area is currently a rural hill land, however once the WEFs are constructed, the character of this area would be industrial. Transmission lines are associated with this development.

Compatibility with the surrounding landscape is rated appropriate.

4.10.2 The *preferred* route as it traverses lower ground between the plateau and De Aar
The existing landscape is rural, open, undulating, and traversed by several existing transmission lines.

Compatibility with the surrounding landscape is rated appropriate.

4.10.3 Alternative
The *alternative* route would also be judged appropriate
The *No-Go Alternative* will be seen as a part of the surrounding landscape as the status quo will not change.

4.11 Intensity or Magnitude, of Visual Impact

This refers to the degree to which the visual nature of the landscape will be altered.

zero: natural and/or social functions and/or processes remain unaltered
very low: natural and/or social functions and/or processes are negligibly altered
low: natural and/or social functions and/or processes are slightly altered
medium: natural and/or social functions and/or processes are notably altered
high: natural and/or social functions and/or processes are severely altered

4.11.1 The *preferred* route as it traverses the higher ground of the Plateau
The visual intensity of the proposed transmission line is less than anticipated because it would relate to the WEF, a development offering much greater impact. The impact will be noticeable but there would be local context; rated very low

4.11.2 The *preferred* route as it traverses lower ground between the plateau and De Aar
The visual intensity of the proposed transmission line would be experienced in a landscape already carrying many transmission lines. The impact would be noticeable but there is local context; rated very low

4.11.3 Construction Period
The visual intensity is rated as medium as the access routes and access points would be visible to receptors locally and there would be many traffic movements.

4.11.4 Operational Period
The general area already carries many transmission corridors albeit of different specifications and therefore there is local context. The intensity of the visual impact is judged to be very low. The impact will be noticeable but negligible.

4.11.5 Alternatives
Layouts: The intensity of the visual impact is judged to be very low. The impact will be noticeable but negligible.

Activities: The visual intensity of the *No-Go Alternative* would be zero because no changes to the landscape are currently anticipated.

4.11.6 Conclusion
The Intensity, or Magnitude, is summarised from the foregoing as medium during the construction period, reducing to very low thereafter

4.12 Duration of the Visual Impact

The duration of the impact upon its surroundings, from one year, (temporary) up to beyond 15 years, (permanent/long term).

The whole development, (civil engineering services, erection of infrastructure, etc.,) would not be phased and the total construction period is estimated at 6 months. The duration of the development is intended to be as long term as any transmission line development and to extend beyond 20 years. The duration is judged to be long term.

The duration of the *alternative* layout is also deemed to be long term. The duration of the *No-Go alternative* cannot be known at this time but may not be permanent.

4.13 Probability

The visual impact would probably not happen.
There is some possibility but a low likelihood of the visual impact.
The visual impact is probable, there is a distinct possibility that it would occur.
The visual impact is most probable, most likely.
The visual impact is definite and would occur regardless of any prevention measures.

Assessing the range of impacts identified in foregoing paragraphs indicates that these impacts are most probable.

4.14 Significance of the Visual Impact

The significance of the visual impact is assessed as a combination of:

- the extent of the impact (paragraph4.6, local)
- the length of time over which it may be experienced, (paragraph4.12,long term)
- the intensity of the impact, (paragraph4.11,very low).

and the significance ratings in Addendum 2

Examining all these impacts allows an assessment of the significance to be made.

Initially, the overall significance of the *preferred* layout is assessed to be low as there will be long term change in the local landscape. This will be due to the activities associated with the construction period as well as the operational phase, but within a partly industrial landscape. With increasing maturity of the development its visual significance would not be expected to change; the significance would remain low.

The *alternative* layout would have a low significance. The *No-Go Alternative* would have zero significance, as the status quo will not alter.

4.15 Potential Cumulative Visual Impacts.

Looks at the accretion of similar developments over time

It is not known if the proponent, or any other body, would consider further phases on this route to serve additional alternative energy projects, or to provide additional transmission lines. That would depend upon factors outside of the scope of this study. However, if De Aar continues to develop as a renewable energy hub and if future projects are approved, it would result in additional infrastructure (such as roads and transmission lines) as well as solar panels and turbines being established. The local landscape character would be made more industrial. In the context of the De Aar area, with its long views, exposed sites and roads with little traffic, the cumulative impact is considered to be of moderate significance.

Adding further transmission lines to existing routes, in parallel, could be preferable to establishing new routes as it would reduce their visual impact.

If the servitude is not developed, and the *No Go Alternative* prevails, there may or may not be cumulative impacts; the site appears stable in its land uses at this time.

4.16 Visual Sensitivity Assessment

Overall sensitivity of the local landscape types to this development is assessed on the basis of the relative ability of a landscape to respond to and, where appropriate, accommodate, change of a particular type; in this case, transmission lines.

Landscape character sensitivity, is defined as: *"the sensitivity of the landscape as a whole, in terms of its overall character, its quality and condition, the aesthetic aspects of its character, and also the sensitivity of individual elements contributing to the landscape''*.
Source: GLVIA, LI, UK, 2012.

The scale of the plateau, in terms of its height and extent, can absorb the development and will effectively background it. The lower lands between the plateau and De Aar already carry similar developments and the centres of habitation are small, few in number and would not be dominated by the proposals.

Therefore the sensitivity of the landscapes along the route is assessed as low.

4.17 Viewpoints and Images.

The images were created on site and within the surrounding landscape from locations where the development transmission line servitude would be deemed to be visible. They were created during the morning and afternoon in December 2012. The weather was clear and open, and deemed to be typical. The camera was set at a focal length deemed to be as close to natural eye experience as possible.
No filters were used. Panoramic images have been overlapped and stitched.

1965
Figure 4.3: Image 1 The preferred line would run in parallel with existing lines. Source: Hansen.

1973

Figure 4.4: Image 2 The open landscape through which the transmission line would run. Source: Hansen.

273

Figure 4.5: Image 3: A view from 2km away looking north-west over the landscape that would carry the proposed transmission line. Source: Hansen.

Fig 4.6: Image 4: the view from the farm road just east of Matiesfontein showing the backgrounding effect of existing pylons ascending the Eastern Plateau. Source: Hansen

276

Figure 4.7: Image 5: In 2km distance from Hydra the density of transmission lines is clearly seen. Source: Hansen.

278

Figure 4.8: Image 6 View of Hydra from the east where the new line would enter the substation. Source: Hansen.

284

Figure 4.9: Image 7 Typical view in the landscape around Hydra where the lands are traversed by transmission lines. Source: Hansen.

5.0RECOMMENDED MITIGATION MEASURES

5.1 Construction phase

5.1.1Environmental Management Plan
An environmental management plan should be drawn up to set out principles for the implementation of the visual mitigation measures.The developer is required to demonstrate that all these measures are included in the design and construction phase

5.1.2 Location of construction access
For the duration of the six month, (estimated), civils contract there would be transport and storage of the towers, installation equipment, and construction of foundations. The contract time should be kept to the minimum, road junctions should have good sightlines, traffic control measures, signage and dust control measures should also be provided. These measures are to reduce visual impact.

5.1.3 Construction Camp
Lay down areas and construction camp should have temporary screen fencing if necessary. Site offices, if required, should be limited to single storey and sited carefully using temporary screen fencing to screen from the wider landscape.

5.1.4 Fires litter and contaminants:
Fires should not be allowed, and no litter and no contaminants to be allowed to enter the environment by any means; they should be taken to a licensed waste disposal facility. Utilisation of such substances should be controlled on site, especially in close proximity to the aquatic environment, (Brak River), and should be included in the Environmental Management Plan. These measures are to reduce visual impact.

5.2 Operational Phase

5.2.1 New roads
The works, in the upland area, could be accessed from roadways already defined in the management plan for the proposed WEF there are also local gravel roadways crossing the servitude The only additional routes would be those for maintenance access and these should be gravel surfaced jeep tracks.

5.2.2 Visibility of Transmission Towers
There is a number of different pylon specifications used locally, and all, whether lattice or timber have a lightweight appearance which is not too visually dominant, and can be better backgrounded. The solid poles specified for this development could be more visually evident and could be absorbed less easily into the landscape, but these towers also have a smaller footprint and a technical advantage as they can support additional lines in the future.

5.2.3 Layout
The powerline alignment as currently presented proposes a number of changes in direction which are an inevitable result of transmission requirements and land ownership. Where there is a change in direction a guyed suspension tower is needed and, along a straight, a self-supporting

tower. The visual impact of any of these proposed transmission routes could be moderated by keeping changes of direction to a minimum and increasing the span between towers to the practical maximum.

It is noted that there is little difference between the *preferred* and the *alternative* routes in terms of changes of direction and the need for additional guyed suspension towers.

5.3 Summary

5.3.1 Reduce the construction period through careful logistical planning and productive implementation of resources, monitor traffic and control dust.

5.3.2 Lay down areas, construction camp, site offices, should be sited carefully and use temporary screen fencing to screen from the wider landscape.

5.3.3 Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.

5.3.4 Moderate the impact of the infrastructure by keeping changes of direction to a minimum and increasing the span between towers to the practical maximum.

Table of the Visual Significance of the Impacts associated with the Construction and Operation of the De Aar 2 North Transmission Line.

Note: ' Long term' means the whole life of the project which could be up to 20-25 years

	Nature of impact	Extent of impact	Duration of impact	Intensity	Probability of occurrence	Status of impact	Degree of confidence	Reversibility	Level of significance	Mitigation Measures	Significance after mitigation
1	**CONSTRUCTION PHASE**										
1.1	Location of construction access, lay-down areas, site offices, use of screen fencing	Local, site specific	Construction period	Medium	Definite	Negative	Certain	Reversible	Medium	Comply with road safety requirements, careful siting, and screening	Low
1.2	Traffic and dust control on existing roads. Control of site waste	Local, site specific	Construction period	Medium	Definite	Negative	Certain	Reversible	Medium	Comply with EMP	Low
1.3	Construction of any new tracks	Local, site specific	Construction period	Medium	Definite	Negative	Sure	Reversible	Medium	Careful placing for least visibility; use of gravel as surface	Low
1.4	Length of Construction period	Local, site specific	Construction period	Medium	Definite	Negative	Sure	Reversible	Medium	Careful logistical planning	Low
1.5	Construction of 132kV transmission line	Local, site specific	Construction period	Medium	Definite	Negative	Sure	Reversible	Medium	Careful planning	Medium-Low
2	**OPERATIONAL PHASE**										
2.1	Maintenance visits	Local	Long term	Low	Definite	Neutral	Certain	Neutral	Low	None	Low
2.2	The impact of the new transmission line	Local, site specific	Long-term	Medium	Definite	Negative	Certain	Reversible	Low	None	Low
3	**ALTERNATIVES Alternative Option (Layout)**										
3.1	Impact of transmission line	Local, site specific	Long-term	Medium	Probable	Negative	Certain	Reversible	Low	Siting, layout, changes of direction	low
4	**ALTERNATIVES Alternative Option (Activity) No Go**										
4.1	Retention of status quo	Local, site specific	Long-term	Medium	Probable	Status Quo	Sure	Reversible	Low	n/a	n/a
5	**CUMULATIVE IMPACTS**										
5.1	Transmission lines	Local	Long-term	Medium	Definite	Negative	Sure	Reversible	Medium	Habituation	Low

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Context

This proposed development will provide similar land uses to those in the immediate locality. The preferred line is moderate in scale, 26.5km long, (the alternative is 25.6km long), close to some farmsteads and a freight rail line.

6.2 Visual Statement

Pylons are intrusive in any landscape but De Aar has been associated with these transmission lines for a long time; this industrialisation of the landscape is part of the existing visual context. Towers of the solid pole design make a somewhat stronger visual statement than lattice or timber pylons. And also they are not so effectively backgrounded which could increase their impact within 1km. Changes of direction may require more guyed suspension towers. The visual impact of these proposed changes in route direction could be moderated by keeping changes of direction to a minimum and increasing the span between towers to the practical maximum.

The proximity of the development to a few farmsteads is noted; this concern is moderated and contextualised by existing transmission lines. There are few other local receptors.

No visual concerns were identified, no red flags, no potential risks to the receiving environment.

6.3 Visual Impact Rating

The significance if the visual impact is rated as low, during the operational phase, receptors could become habituated to the additional transmission servitude.

6.4 Visual Sensitivity Issues

The sensitivity of the landscapes along the route is assessed as low, since the landscape is contextualised by transmission lines and can thus accommodate additional transmission lines with careful planning.

6.5 Comparison of the Alternative Layouts

The *preferred* route is marginally longer than the *alternative*, and their visual impacts are rated individually as low due to the few, and distant receptors and also due to their sharing existing transmission line corridors. The no-go alternative was also assessed.

6.6 Recommendations

It is recommended therefore that from a visual perspective, the proposed construction of the *preferred* 132kV transmission line from De Aar 2 to Hydra substation should proceed and that the agreed mitigation measures are undertaken, relating to the:

5.3.1 to 5.3.3 Construction Phase and the provision of an Environmental Management Plan.
5.3.4 Layout of the route, with reference to changes of direction and spacing of masts.

Addendum 1: Visual Impact Assessments : Definitions and Ratings

Visual Impact Assessments : Definitions and Ratings
Referred to are criteria specific to visual impact assessments referred to in the DEA&DP guideline document and which are as follows:

Viewshed
The viewshed refers to the theoretical outer-most extent of the area from which an object may be seen. Visibility can be obscured in part or in whole by objects within the viewshed such as existing buildings, trees, or landform.

Rating – not rated, a description given

Visibility of the Site
A description of the actual places within the view shed from which the site can be seen; significant views are discussed

Rating: not rated, a description given

The Extent of the Visual Impact
Rates the impact in terms of the geographical area that will be influenced by the visual impact

Ratings :

- no impact: no visual impact
- limited: visual impact is small, generally confined to the site
- local: the site and the immediate surrounding area, (1-5km)
- sub-regional: a greater area is influenced, (5-10km)
- regional: the influence extends to an entire region
- national: the influence has national importance and extends beyond boundaries

Visual exposure
Visual exposure refers to the visibility of the project site in terms of the capacity of the surrounding landscape to offer screening. This is determined by the topography, tree cover, buildings, etc.

Ratings:

- no exposure: the site is hidden by topography, planting, etc
- low: the site is largely hidden
- medium: the site is partially hidden
- high: there is little in the surrounding landscape that can shield the development from view

Zones of visual influence
Describes the areas visually influenced by the proposed development, and assesses the amount of influence
Ratings:
non-existant: the site cannot be seen from surrounding areas
low: the development is largely shielded from view by topography, planting, etc
moderate: the development is partially shielded
high: the development strongly influences the view and acts as a visual focus

Visual Absorption Capacity
This refers to the ability of the surrounding area to visually absorb the development. In this assessment, high is a positive and low is a negative

Ratings:

- low: the area cannot visually absorb the development
- medium: the area can absorb the development to a degree but it will look somewhat out of place
- high: the area can easily visually absorb the development

Compatibility with Surrounding Landscape
This refers to the extent to which the proposed development and land usage is in line with the surrounding development and land usage.

Ratings:

- appropriate: the development will fit in well with the surrounding landscape
- moderately appropriate: the development can blend in, but to a lesser degree and only with care
- inappropriate: the development introduces new elements into the landscape that do not fit in.

Intensity or Magnitude, of Visual Impact
This refers to the degree to which the visual nature of the landscape will be altered.

Ratings:

- low: the impact is noticeable but does not act as a strong focus in the landscape
- moderate: the landscapes visual nature is altered in a way that is noticeable
- high: the visual impact of the development intrudes into the landscape in a noticeable way

Duration of visual Impact
The duration of the impact upon its surroundings

Ratings:

- temporary: one year or less
- short term: one to five years
- medium term: five to fifteen years
- long term: more than fifteen years

Significance of the Visual Impact
This rating combines the other ratings and looks at the overall impact

Ratings:

- very low: the visual impacts will be limited to the site itself
- low: the impacts will be local, and/or in the short term
- moderate: the impacts will be experienced locally and may lead to permanent change in the local landscape
- high: these impacts will be experienced over a wide area, or sub regionally and will be irreversible

Potential Cumulative Visual Impacts
Looks at the accretion of similar developments over time

Ratings: not rated, a description given

Addendum 2: Method of Assessing the Significance of potential environmental impacts.

This method has been drawn up by the EAP and its ratings and criteria are adopted in this report.

For each impact, the EXTENT (spatial scale), MAGNITUDE and DURATION (time scale) would be described. These criteria would be used to ascertain the SIGNIFICANCE of the impact, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place. The mitigation described in the EIAR would represent the full range of plausible and pragmatic measures but does not necessarily imply that they would be implemented.[1]

The tables on the following pages show the scale used to assess these variables, and defines each of the rating categories.

Table 0.1 Assessment criteria for the evaluation of impacts

CRITERIA	CATEGORY	DESCRIPTION
Extent or spatial influence of impact	**Regional**	Beyond a 10 km radius of the candidate site.
	Local	Within a 10 km radius of the candidate site.
	Site specific	On site or within 100 m of the candidate site.
Magnitude of impact (at the indicated spatial scale)	**High**	Natural and/ or social functions and/ or processes are *severely* altered
	Medium	Natural and/ or social functions and/ or processes are *notably* altered
	Low	Natural and/ or social functions and/ or processes are *slightly* altered
	Very Low	Natural and/ or social functions and/ or processes are *negligibly* altered
	Zero	Natural and/ or social functions and/ or processes remain *unaltered*

CRITERIA	CATEGORY	DESCRIPTION
Duration of impact	**Construction period**	Up to 2.5 years
	Short Term	Up to 5 years after construction
	Medium Term	5-15 years after construction
	Long Term	More than 15 years after construction

The SIGNIFICANCE of an impact is derived by taking into account the temporal and spatial scales and magnitude. The means of arriving at the different significance ratings is explained:

Table 0.2Definition of significance ratings

SIGNIFICANCE RATINGS	LEVEL OF CRITERIA REQUIRED
High	• High magnitude with a regional extent and long term duration • High magnitude with either a regional extent and medium term duration or a local extent and long term duration • Medium magnitude with a regional extent and long term duration

[2] The applicant will be requested to indicate at the Draft EIAR stage which alternative and mitigation measures they are prepared to implement.

Medium	• High magnitude with a local extent and medium term duration • High magnitude with a regional extent and construction period or a site specific extent and long term duration • High magnitude with either a local extent and construction period duration or a site specific extent and medium term duration • Medium magnitude with any combination of extent and duration except site specific and construction period or regional and long term • Low magnitude with a regional extent and long term duration
Low	• High magnitude with a site specific extent and construction period duration • Medium magnitude with a site specific extent and construction period duration • Low magnitude with any combination of extent and duration except site specific and construction period or regional and long term • Very low magnitude with a regional extent and long term duration
Very low	• Low magnitude with a site specific extent and construction period duration • Very low magnitude with any combination of extent and duration except regional and long term
Neutral	• Zero magnitude with any combination of extent and duration

Once the significance of an impact has been determined, the PROBABILITY of this impact occurring as well as the CONFIDENCE in the assessment of the impact, would be determined using the rating systems outlined in **Table 0.3** and
Table 0.4 respectively. It is important to note that the significance of an impact should always be considered in concert with the probability of that impact occurring. Lastly, the REVERSIBILITY of the impact is estimated using the rating system outlined in **Table 0.5**.

Table 0.3 Definition of probability ratings

PROBABILITY RATINGS	CRITERIA
Definite	Estimated greater than 95 % chance of the impact occurring.
Probable	Estimated 5 to 95 % chance of the impact occurring.
Unlikely	Estimated less than 5 % chance of the impact occurring.

Table 0.4 Definition of confidence ratings

CONFIDENCE RATINGS	CRITERIA
Certain	Wealth of information on and sound understanding of the environmental factors potentially influencing the impact.
Sure	Reasonable amount of useful information on and relatively sound understanding of the environmental factors potentially influencing the impact.
Unsure	Limited useful information on and understanding of the environmental factors potentially influencing this impact.

Table 0.5 Definition of reversibility ratings

REVERSIBILITY RATINGS	CRITERIA
Irreversible	The activity will lead to an impact that is in all practical terms permanent.
Reversible	The impact is reversible within 2 years after the cause or stress is removed.

Addendum 3 : Declaration of Interest

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

	(For official use only)
File Reference Number:	12/12/20/
NEAS Reference Number:	DEAT/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2010

PROJECT TITLE

Longyuan Mulilo De Aar 2 North Wind Energy Facility

Specialist:	Karen Hansen Landscape Architect		
Contact person:	Karen Hansen		
Postal address:	Postnet Suite 15, P Bag 15, Somerset West, W Cape		
Postal code:	7129	Cell:	072 840 8900
Telephone:	021 855 2997	Fax:	021 855 2997
E-mail:	hansentk@cybersmart.co,za		
Professional affiliation(s) (if any)	Chartered Landscape Architect		

Project Consultant:	Aurecon South Africa (Pty) Ltd		
Contact person:	Tamryn Johnson		
Postal address:	P.O. Box 494, Cape Town		
Postal code:	8000	Cell:	072 288 0419
Telephone:	021 526 5737	Fax:	021 529 9500
E-mail:	tamryn.johnson@aurecongroup.com		

4.2 The specialist appointed in terms of the Regulations_

I, **Karen Hansen** , declares that --

General declaration:

- I act as the independent specialist in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of section 24F of the Act.

Signature of the specialist:

KHLA

Name of company (if applicable):

25th March 2014

Date:

Addendum 4: CV

Karen Hansen, Independent Consultant Landscape Architect and Visual Assessment specialist

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Qualifications
Chartered Membership of the Landscape Institute, UK, in 1982, registered nr. 11994.

Strathclyde University, Scotland, 1995 course in Environmental Impact Assessment covering the legislative background to, and practice of, Environmental Impact Assessment, with particular reference to Visual Impact Studies.

Experience in South Africa
2011 onward: Independent Consultant Landscape Architect specialising in, *inter alia*, Visual Assessments

2010 to **2011**: Consultant Landscape Architect to Viridian Consulting (Pty) Ltd.

2006 to **2010**: Senior Landscape Architect with Viridian Consulting, (Pty) Ltd., Somerset West, undertaking a number of landscape design projects as well as environmental studies.

Experience in UK
2000 to **2006**: Landscape Architect and Team Leader with Glasgow City Council. Master planning, design, implementation of the Heritage Lottery funded urban parks and urban dual carriageways.

1992 to **2000**: Partner with Kirklee Landscape Architects, Glasgow, Scotland, undertaking a number of landscape design projects as well as environmental studies.

Environmental Studies:

Alternative Energy

- Visual Scoping Study for Wind Turbines and Wind Measuring Masts in N and W Cape
- Visual Impact Assessment, baseline studies, for Wind Measuring Masts, Vredendal, Worcester, and De Aar.
- Visual Impact Assessments, level 3, for the establishment of Alternative Energy sites: Wind Farms, Photovoltaic installations and Concentrating Solar Power Installations in six centres in the Western and the Northern Cape, (De Aar, Vredendal, Worcester, Bitterfontein/Namaqualand, Springbok, Copperton/Prieska).
- Visual Impact Assessment, Baseline Study, Photovoltaic Installation in Vredendal, W Cape.
- Visual Impact Assessment, level 3, for a Wind Farm near Koekenaap, W Cape.
- Visual Impact Assessment, level 3, for a Wind Farm at Copperton, N Cape.
- Visual Impact Assessment, level 3, Matzikamma Solar Park, Vredendal, W Cape.
- Visual Scoping Study, Photovoltaic Installation, Aggeneys, N Cape.
- Visual Impact Assessment, level 3, Two Wind Farms, Eastern Plateau, De Aar, N Cape.
- Visual Impact Assessment, level 3, Three Photovoltaic Installations, at Paarde Valley, Badenhorst Dam Farm, Annex du Plessis Farm, at De Aar, N Cape.
- Visual Impact Assessment, level 3, Photo-voltaic installation, Hoekplaas Farm, Copperton, N Cape
- Visual Impact Assessment, level 3, Photo-voltaic installation, Klipgats Pan Farm, Copperton, N Cape
- Visual Impact Assessment, level 3, Photo-voltaic installation, Struisbult Farm, Copperton, N Cape
- Visual Impact Assessment, level 3, Wind Farm at Gouda, W Cape

- Visual Impact Assessment, level 3, Photo-voltaic installation, Stella, NW Province,
- Visual Impact Assessment, level 3, Photo-voltaic installation, Wolmaransstad, NW Province
- Visual Impact Assessment, level 3, Photo-voltaic installation, Boshof, Free State
- Visual Impact Assessment, level 3, Photo-voltaic installation, Hibernia, NW Province
- Visual Impact Assessment, level 3, Photo-voltaic installation, Boundary, Kimberley, Free State
- Visual Impact Assessment, level 3, Photo-voltaic installation, Blackwood, Kimberley, Free State

Transmission Lines

- Visual Impact Assessment, level 2, for Transmission lines for De Wijnlanden Residential Estate, Stellenbosch, W Cape
- Visual Impact Assessment, level 3, for Transmission Lines, Maanhaarberg and Eastern Plateau, De Aar, N Cape

Transport corridors

- Visual Impact Assessment, level 3, as well as design and Implementation of landscape works for major new road, 'Western Distributor Road', Glenrothes, Fife, Scotland.

Forestry/Greenbelt

- Visual Impact Assessment, level 2, study of landscape aspects of felling and restocking of several areas of existing coniferous woodlands and change to native woodland species in catchment area for West of Scotland Water at Loch Katrine, Strathclyde, Scotland.
- Visual Impact Assessment, level 3, for Central Scotland Countryside Trust, part of the process to determine future access and tree planting policy in the Greenbelt surrounding Falkirk, Scotland.

Residential

- Visual Impact Assessment, level 2, Proposed coastal Golf Estate, Prestwick, Scotland.
- Visual Impact Assessment, level 3, for residential development at L' Avenir Winery, Stellenbosch, W Cape
- Visual Impact Assessment, level 3, for proposed residential development over 3,460ha at St Helena Bay, W Cape, a core project of the St Helena SDI.
- Visual Impact Assessment, level 3, for Phase 2 of De Zalze Golf Estate, Stellenbosch.
- Visual Statement for security estate in residential suburb, Somerset West, W Cape
- Visual Impact Assessment for Haasendal II, Kuilsriver, W Cape

Mixed uses/Retail

- Visual Impact Assessment, level 3, Mixed Use Development at Mandalay, Khayelitsha, Cape Town
- Visual Impact Assessment, level 3, Mixed Use Development, Crammix Brickworks, Cape Town.
- Visual Impact Assessment, level 3, for a new Retail Mall, Philippi, Cape Town.
- Visual Impact Assessment, level 3, for Suider-Paarl Business Park, Paarl, W Cape
- Visual Impact Assessment, level 3, for Commercial Development, Farm Welgemoed, Atlantis, W Cape

Industry

- Visual Scoping Study for Scrap Metal Yard at Blackheath, Cape Town
- Visual Impact Assessment, level 3, Meerlust Wine Estate, Proposed Bottling Plant
- Visual Impact Assessment, level 3, for Agri-Industrial uses at Klapmuts, Paarl, W Cape

Education

- Visual Impact Assessment, level 3, University of Cape Town Middle Campus, Rondebosch, for Urbanscapes, MLH Architects and UCT; to assess impacts derived from change of use of multi-level piazza to new lecture theatre and administration buildings

Tourism

- Visual baseline study for tourism development at Kogel Bay Tourist Resort, Western Cape as part of the Development Framework Policy document
- Visual Impact Assessment, level 2, Airport Hotel, Edinburgh Airport, Scotland.

Heritage

- Groote Schuur Estate, Rondebosch, Cape Town, Landscape and Heritage Assessment
- Worcester Transport Interchange, W Cape
- Bakkerskloof, 1792, Somerset West, W Cape

Mining

- Visual Impact Assessment, Baseline Study, Palmiet Quarry Extension, Grabouw, W Cape.
- Visual baseline studies for abandoned open cast mines for British Coal Opencast, at Knockshinnoch Nature Reserve, Ayrshire, and others, for recreational uses.
- Elandsfontein Minerals and Mining, Hopefield W Cape

Karen Hansen has no business, financial, personal or other interest other than fair remuneration for work performed in connection with these studies and there are no circumstances that may compromise her objectivity in pursuing and serving the interests of the public.

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Other Information
BEE Certification nr EME/B-BBEE/2013/04/047: Level 4, Exempt Micro Enterprise.
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VAT nr: 4100261926

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