ABO Wind renewable energies (Pty) Ltd

PROPOSED ABO WIND UJEKAMANZI WIND ENERGY FACILITY 2, MPUMALANGA PROVINCE

LANDSCAPE & VISUAL IMPACT BASELINE REPORT

APRIL 2023

Prepared by:
AFZELIA
236 Ninth Avenue,
Morningside,
Durban,
4001.

Tel: 031 303 2835
Email: jon@enviroconsult.co.za

Prepared for:
SIVEST
12 Autumn Street,
Rivonia,
2128.

Tel: 011 581 1576
Email: LuvanyaN@sivest.com

EXECUTIVE SUMMARY

GENERAL

The screening Report highlighted that fact that the proposed site was likely to be highly sensitive to the development of a Wind Energy Facility. However, it did not indicate why it was likely to be sensitive.

Landscape character areas, receptors and site sensitivities were investigated through a desk top analysis and a site visit.

LANDSCAPE AND RECEPTOR SENSITIVITY

The Approximate Limit of Visibility and hence the initial study area was set at 47.9km from the site boundary.

Within this study area, the landscape was characterised and likely receptors identified and the following levels of sensitivity assessed:

SENSITIVITY	Landscape Character Areas (LCAs)	RECEPTORS
Low	Areas not recognised as having specific landscape value. **The Urban and the Industrial LCAs.**	Viewer's attention not focused on landscape. These include: • **Residents of urban areas**
Medium	Landscape value is recognised locally, but is not protected; the landscape is relatively intact, with a distinctive character; and the landscape is reasonably tolerant of change. These areas include: • **The Rural LCA.**	Viewers' attention may be focused on landscape. These include: • **Homesteads; and** • **Users of main and local roads.**
High	The qualities for which the landscape is valued are in a good condition, with a clearly apparent distinctive character. This distinctive character is susceptible to relatively small changes. • **Protected Areas.**	Viewer's attention very likely to be focused on landscape, e.g. people experiencing views from important landscape features of local physical, cultural or historic interest and beauty spots. Large number of viewers and/or location in a highly valued landscape could elevate viewer sensitivity to the highest level. These include: • **Visitors to the protected areas; and** • **Visitors to the Ons Pan Fishing Attraction.**

SITE SENSITIVITY

The landscape within the site is not sufficiently sensitive to require No-Go areas. However, within the proposed site the following sensitivities were identified:

Highly Sensitivity Areas include:

- Areas immediately surrounding settlement and homesteads development of which is likely to significantly change the character of views for residents. A 200m buffer is proposed which should be sufficient to ensure that there is separation between turbine blades and structures. It is possible that receptors (owners /residents) have no concern regarding the development of these areas, in which case the sensitivity rating will reduce; and
- Corridors beside the main roads that could be affected including the N11 and local roads. This is deemed sensitive because development in this corridor is likely to be highly obvious and could be distracting to people travelling along the roads the proposed 200m corridor should be sufficient to ensure that there is a minimum 100m between moving blades and the roads.
- Natural landscape features which on this site are primarily watercourses and wetlands. A buffer equal to the wetland specialists recommendation is proposed. The purpose is to maintain these natural landscape features throughout the life of the proposed project.

Medium Sensitivity Areas include:

- A 500m buffer between homesteads and turbine locations is recommended. This should be sufficient to ensure that development does not totally dominate views;

Low Sensitivity Areas include:

- Valley side slopes the development of which is likely to make the project least obvious from surrounding areas. The fact that development may be focused on areas with relatively low sensitivity does not preclude the necessity for mitigation.

REQUIRED LEVEL OF STUDY

A Level 4 Assessment in accordance with the ***Government of the Western Cape Guideline for Involving Visual and Aesthetic Specialists in EIA Processes*** is recommended.

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1 INTRODUCTION

1.1 GENERAL

This Landscape and Visual Impact Baseline Report forms part of the Feasibility / Site Planning and Basic Assessment process that is being undertaken for the proposed Ujekamanzi Wind Energy Facilities. The process is being undertaken by Sivest on behalf of ABO Wind renewable energies (Pty) Ltd.

1.2 PROJECT LOCATION

The proposed development Area is located approximately 20km south of Ermelo in the Mpumalanga Province (Map 1: Locality Map).

The approximate geographic coordinates of the centre of the proposed Focus Area are;

South	26^0	55'	24.45"
East	29^0	57'	36.98"

Property descriptions of the potentially affected properties are included in the Scoping Report.

No site alternatives are under consideration, however layout alternatives within the Focus Area are being considered.

1.3 BACKGROUND OF SPECIALIST

Jon Marshall (Pr. LArch, CMLI, Dip LA) qualified as a Landscape Architect in 1978. He has been a Chartered Member of the Landscape Institute (UK) since 1986. He is also a registered Landscape Architect and has extensive experience of environmental impact assessment in South Africa.

During the early part of his career (1981 – 1990) he worked with Clouston (now RPS) in Hong Kong and Australia. During this period he was called on to undertake visual impact assessment input to numerous environmental assessment processes for major infrastructure projects. This work was generally based on photography with line drawing superimposed to illustrate the extent of development visible.

He worked in the United Kingdom (1990 – 1995) for major supermarket chains including Sainsbury's and prepared CAD based visual impact assessments for public enquiry for new store development. He also prepared the VIA input to the environmental statement for the Cardiff Bay Barrage for consideration by the UK Parliament in the passing of the Barrage Bill (1993).

His more recent VIA work in Africa (1995 to present) includes a combination of CAD and GIS based work for a new international airport to the north of Durban, new heavy industrial operations, overhead electrical transmission lines, mining operations, a number of commercial and residential developments as well as numerous renewable energy projects.

A brief CV is attached for information (**Appendix I**).

1.4 BRIEF AND RELEVANT GUIDELINES

The brief is to determine the sensitivity of the affected landscape and review the possible nature of landscape and visual impacts that the proposed project could result in and specifically to;

- Characterise the affected landscape;
- Identify potential sensitive landscapes and receptors that may be impacted by the proposed facility and the types of impacts that are most likely to occur; and
- Provide sensitivity mapping identifying 'No-Go' areas, and areas for development that will minimise landscape and visual impacts.

Work has been undertaken in accordance with the following guideline documents;

a. The Government of the Western Cape Guideline for Involving Visual and Aesthetic Specialists in EIA Processes (Western Cape Guideline), which is the only local relevant guideline, setting various levels of assessment subject to the nature of the proposed development and surrounding landscape, and

b. The Landscape Institute and Institute of Environmental Management and Assessment (UK) Guidelines for Landscape and Visual Impact Assessment which provides detail of international best practice (UK Guidelines).

Refer to **Appendix II** for the Western Cape Guideline.
The required specialist reports will be undertaken in accordance with Appendix 6 of the EIA Regulations, as amended (GN No. 326 of 7 April 2017).

The requirement for this was highlighted in the DFFE Screening Tool Report which indicated that a Landscape and Visual Impact Assessment was required. This report indicates that a site sensitivity verification must be undertaken in accordance with Government Notice No. 320 included in Government Gazette 43110 of the 20th March 2020. This document fulfils these requirements.

In addition to the above, this document complies with Appendix 6 of the EIA Regulations which lists requirements of Specialist Reports, see schedule below.

Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6	**Section of Report**
1. (1) A specialist report prepared in terms of these Regulations must contain- a) details of- i. the specialist who prepared the report; and ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	1
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Separate document.
c) an indication of the scope of, and the purpose for which, the report was prepared;	1
(cA) an indication of the quality and age of base data used for the specialist report;	1
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Sections 4,5 & 6
d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	1

e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Sections 1, 3 & 4
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 4 & 5
g) an identification of any areas to be avoided, including buffers;	Section 5
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;	Map 4
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1
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;	3
k) any mitigation measures for inclusion in the EMPr;	At the scoping stage no detailed assessment has been undertaken so detailed mitigation measures have not been developed.
l) any conditions for inclusion in the environmental authorisation;	At the scoping stage no detailed assessment has been undertaken so detailed mitigation measures have not been developed.
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	At the scoping stage no detailed assessment has been undertaken so detailed mitigation measures have not been developed.
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	At the scoping stage no detailed assessment has been undertaken.

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, and where applicable, the closure plan;	
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	Consultation will be undertaken based on findings of the scoping stage
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Consultation will be undertaken based on findings of the scoping stage
q) any other information requested by the competent authority.	Confirmation of proposed study methodology (Section 7.2)
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.	1

Landscape and Visual impact assessment work will be undertaken in accordance with the following guideline documents;

c. The Government of the Western Cape Guideline for Involving Visual and Aesthetic Specialists in EIA Processes (Western Cape Guideline), which is the only local relevant guideline, setting various levels of assessment subject to the nature of the proposed development and surrounding landscape, and

d. The Landscape Institute and Institute of Environmental Management and Assessment (UK) Guidelines for Landscape and Visual Impact Assessment which provides detail of international best practice (UK Guidelines).

Refer to **Appendix II** for the Western Cape Guideline.

1.5 LIMITATIONS AND ASSUMPTIONS

GIS data sets used in the assessment are either available on line to the public or have been sourced from relevant government departments.

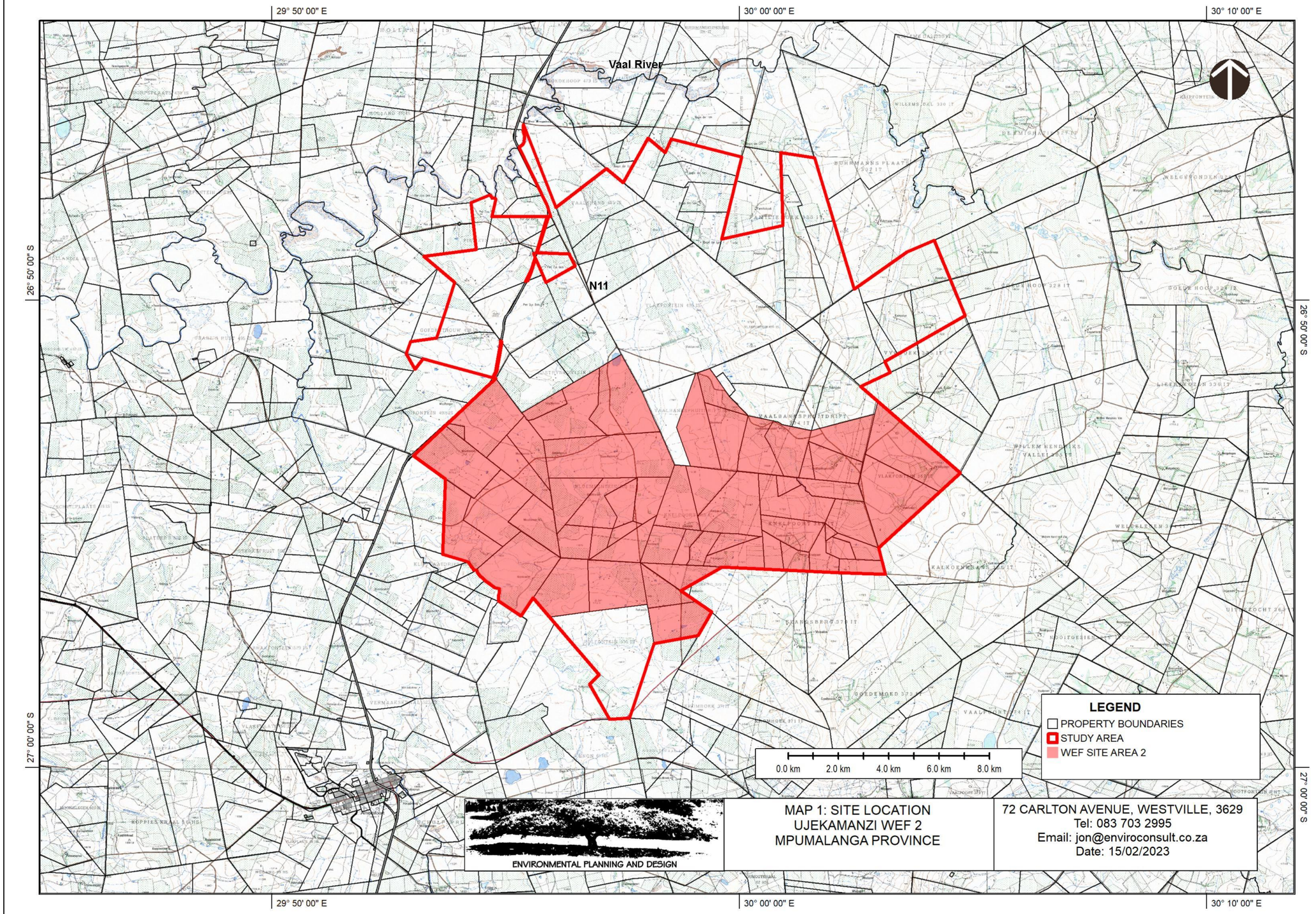
DATA SET	SOURCE	YEAR
South Africa Protected Areas Database (SAPAD)	Department of Environmental Affairs	2021
SRTM Worldwide Elevation Data	CIAT-CCAFS	2018
World Imagery	ESRI	2009 (updated 2021)
Renewable Energy EIA Applications	Department of Environmental Affairs	February 2021
REDZ Database	Department of Environmental Affairs	2016 and 2020
SA NLC (National Land Cover)	Department of Environmental Affairs	2018

DATA SET	SOURCE	YEAR
1:50,000 raster mapping	Chief Directorate National Geo-Spatial Information of South Africa	Unknown
South African rivers in drainage region ALL	Department of Water Affairs	2012
Mpumalanga Cadastral	Chief Surveyor-General, Department of Rural Development and Land Reform	August 2021 (last updated)
Update of vegm2009	South African National Biodiversity Institute	2015
South Africa /Lesotho Roads	Open Street Map	2014

The majority of data sets have been used for assessment context. This has largely been sourced from government departments. Whilst this has been mainly mapped at national scale it was found to be largely sufficient to provide context for the assessments. Where additional detail was required, such as the location of local roads and homesteads, this was mapped on site and / or captured from online mapping.

This initial assessment has been undertaken using GIS data sets, on-line mapping and the authors experience of the area within which the proposed project is proposed particularly work on proposed renewable energy development at the Majuba and Tutuka Power Stations.

A single site visit was undertaken on the 23rd February 2023. The site visit was timed to ensure clear visibility.


29° 50' 00" E
30° 00' 00" E
30° 10' 00" E
26° 50' 00" S
27° 00' 00" S
Vaal River
N11
LEGEND
PROPERTY BOUNDARIES
STUDY AREA
WEF SITE AREA 2
0.0 km
2.0 km
4.0 km
6.0 km
8.0 km
ENVIRONMENTAL PLANNING AND DESIGN
MAP 1: SITE LOCATION
UJEKAMANZI WEF 2
MPUMALANGA PROVINCE
72 CARLTON AVENUE, WESTVILLE, 3629
Tel: 083 703 2995
Email: jon@enviroconsult.co.za
Date: 15/02/2023

2 PROJECT DESCRIPTION

2.1 GENERAL

The proposed project is proposed as one of two WEF projects within the Study Area.

A proposed site area with an extent of #####ha has been identified as a technically suitable area for the proposed Ujekamanzi WEF 2 development.

2.2 PROJECT OVERVIEW

The Environmental Assessment Practitioner has confirmed that each project will accommodate the following infrastructure:

Ujekamanzi WEF 1 & 2		
Component	**Dimensions**	
Wind turbines	Number of turbines:	The number of turbined will be determined at a later stage. The client is requesting authorization for a buildable area.
	MW output per turbine:	Up to 10 MW
	Total installed capacity:	650 MW (TBC)
	Hub Height from ground:	Up to 180 m
	Rotor diameter:	Up to 200 m
	Blade length	Up to 100 m
	Total footprint of turbine and laydown area	Up to approx. 1 ha per turbine (but WTG turbine-dependent)

Ujekamanzi WEF 1 & 2		
Component	**Dimensions**	
	(hardstand area) (ha):	
	Crane pad (m²):	General temporary Hardstand Area (boom erection, storage, and assembly area): 1ha per turbine
	Permanently affected area (foundation size) (m²):	Up to 1 ha, may be able to rehabilitate some of this area
Roads	Width of internal access roads (m):	up to 10m; circle/bypass TBC (WTG specific)
	Length of internal access roads (km):	TBC
	Site access points:	TBC
Upgrading of existing access road/s	Yes/No:	Yes, where necessary
	Current width (m):	TBC (likely between 6m and 8m)
	Upgraded width (m):	Up to 10m
Construction Compounds and Laydown Areas	Footprint (ha):	Up to Approximately 10ha (for Temporary construction period laydown / staging area)
Operational and Maintenance (O&M) control centre building area	Maximum height (m):	
	Footprint (m²):	Up to 1ha (within On-site Substation Hub)
On-site Substation Hub	Included	The proposed project will include one on-site substation hub incorporating the facility substation, switchyard, collector infrastructure, battery energy storage system (BESS) and associated O&M buildings.
	Footprint (ha):	Up to 19ha
	Capacity:	33/132 kV (Project 1-2) & 132/400kV (Project 3-4)
	Height (m):	Up to 10m
	Communications tower: Height (m):	Up to 32m (TBC)
Battery storage	Battery technology type:	Electrochemical Batteries including:
		a. Lead Acid and Advanced Lead Acid
		b. Lithium ion, NiCd, NiMH-based Batteries

Ujekamanzi WEF 1 & 2		
Component	**Dimensions**	
		c. High Temperature (NaS, Na-NiCl2, Mg/PB-Sb)
		d. Flow Batteries (VRFB, Zn-Fe, Zn-Br)
		The BESS would therefore comprise the selected batteries together with chargers, inverters and related equipment.
	Approx. footprint (ha):	Up to 5ha (within On-site Substation Hub)
	Maximum height (m):	Up to 8m or higher as recommended?
	Capacity:	500MW/500MWh
Internal transmissions and/or distribution lines on site	Under or aboveground:	Underground, unless not possible due to enviro reasons
	Capacity (kVA):	Typically 33kV
	If above: height (m)	TBC. "Cables to be buried along access roads, where feasible, with overhead 33kV lines grouping turbines to crossing valleys and ridges outside of the road footprints to get to the on-site substation."
	If below: maximum depth (m)	Up to 1m
	Length (m):	To follow internal site roads (length TBC)
Perimeter fencing	Height (m):	TBC
	Type of material:	TBC
Construction Period (months):	Expected to be 24 months	Expected to be 24 months
Wind Monitoring Masts (if applicable)		Currently 1 met mast is installed with a second met mast planned.
Proximity to grid connection		On-site: The proposed development of a 400 kV Loop-In-Loop-Out (LILO) from the existing 400 kV Overhead Power Line to the proposed MTS

The elements of the proposed project that are likely to have significant visual implications include:

- The Wind Generators (turbines);
- The Battery Energy Storage System (BESS);
- The Substation Complex (on-site substation);

2.2.1 Wind Turbines

A Wind Energy Facility (WEF) is a group or groupings of wind turbine and ancillary equipment that use the wind to generate electricity.

A wind turbine consists of three rotation blades and a nacelle mounted at the tip of a tapered tower. Refer to **Figure 1** for an illustration of the main components of a wind turbine. The mechanical power generated by the rotation of the blades is transmitted to the generator housed within the nacelle, via a gearbox and drive train.

A turbine is designed to operate continuously, unattended and with low maintenance for more than 20 years. Once operating, a WEF can be monitored and controlled remotely with a mobile team for maintenance, when required.

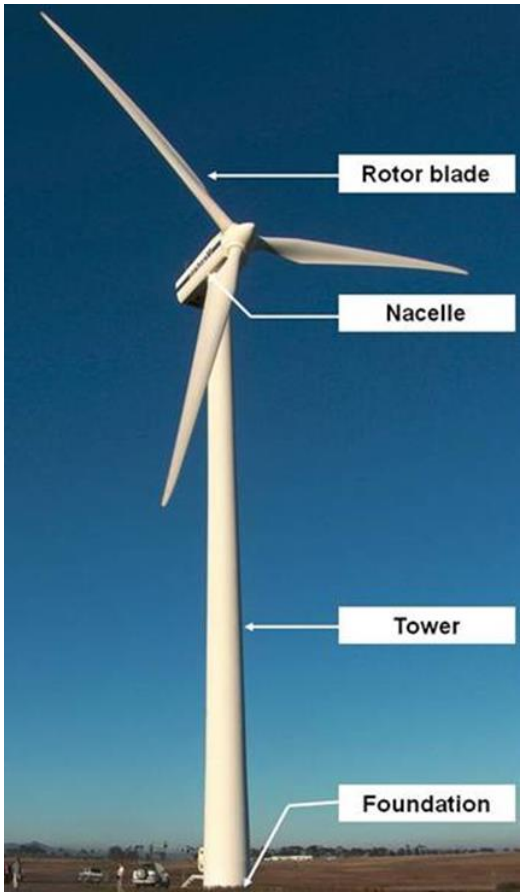


Figure 1: Image of a typical wind turbine.

2.2.3 Battery Energy Storage System

The Battery Energy Storage System (BESS) is likely to appear as a series of structures that house battery facilities. The structures may be up to approximately 5m high.

The BESS will be located in close proximity to the on-site substation.

PLATE 1 TYPICAL BATTERY ENERGY STORAGE SYSTEM

2.2.2 Substation Complex

The substation will step up the electric power from a inverters within the facility to 132kV for delivery to a proposed MTS within the Study Area.

A substation can have circuit breakers that are used to switch generation and transmission circuits in and out of service as needed or for emergencies requiring shut-down of power to a circuit or redirection of power.

The main elements of the on-site Substation that may have visual implications include:

- The incoming 33kV power line which is likely to be underground.
- A security fence line which typically will be a steel palisade or mesh fence approximately 3m high;
- Transformers that will be used to step the power up from 33kV to 132kV.These are likely to be large solid structures in the order of 5m high.
- Buildings to house control and switching infrastructure, stores, restrooms and staff facilities. These are likely to be single storey buildings up to approximately 6m high.
- Security lighting which is likely to be mounted on masts surrounding the MTS. These are likely to be in the order of 10m high.
- Bus bars that will support the outgoing power transmission lines in order that they can link to the outgoing High Voltage. These are likely to be comprised of a steel lattice structure in the order of 10m high.

The various elements can therefore be divided into:

- Lower transparent and opaque elements up to approximately 5-6m high including the security fence, buildings, and transformers; and
- Taller relatively transparent elements up to approximately 10m high including bus bars, and lighting towers.

Because of their visual mass, the lower elements are likely to be highly visible whereas taller more transparent elements are not likely to be as visible over a distance.

PLATE 2, BUS BARS ARE THE HIGHEST SUBSTATION ELEMENTS IN PICTURE

3 AFFECTED LANDSCAPE

3.1 THE STUDY AREA

The study area is comprised of the area over which the proposed development may be visible.

The Approximate Limit of Visibility (ALV) is dictated by height and visual mass of the proposed development, surrounding landscape and built features such as vegetation, ridgelines and buildings as well as the curvature of the earth.

As the terrain is relatively flat, the vegetation relatively low and built elements few and far between, the height of the highest proposed elements and the earth's curvature have been used to set the initial study area.

Whilst technical information was not available at the time of reporting, the highest elements of the proposed development are likely to be the wind turbines.

A mathematical calculation has been used to indicate the Approximate Visual Horizon due to the earth's curvature as seen from the highest point of the proposed development. The formula used is a universally accepted formula that is used widely for navigation and is indicated in **Appendix III**. This indicates that in a flat landscape the project elements are likely to be visible from the distances indicated below:

DEVELOPMENT ELEMENT (Assumed heights)	APPROXIMATE LIMIT OF VISIBILITY (ALV)
Wind Turbine Hub (180m high)	47.9km
Wind Turbine Tip (300m high)	59.8km
On-Site Substation Bus Bars (10m high)	11.3km
On-Site Substation transformers and buildings (5m high)	8.0km
BESS (8m high)	10.1km

Theoretically the proposed turbines may be visible from a distance of 47.9km, however, it is highly unlikely that they will be visible to the human eye from this distance. The ALV of the turbine hub (47.9km) is therefore used as the initial study area.

3.2 LANDSCAPE CHARACTER

Defining the character of the landscape is the first step in understanding the landscape and visual implications of the proposed development.

Landscape character is defined as "a distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another".

Landscape character has been defined from the site visit, the author's knowledge of the area and from reference to available online mapping and aerial photography.

Landscape Character is a composite of a number of influencing factors including;

- Landform and drainage.
- Nature and density of development.

- Vegetation patterns.

3.2.1 Landform & Drainage

The general landform in the vicinity of the project is undulating and is comprised of a series of similar size rounded ridgelines that extend approximately 50-100m above generally broad but sometimes steep valley lines.

Approximately 19km to the east the land falls steeply to the Lowveld. The height difference is in the order of 100-200m.

Approximately 1km to the north of the site the main regional drainage feature Vaal River flows roughly in a north-east to south-west direction and parallel to the northern boundary of the study area. In the vicinity of the project, the Vaal flows through a broad shallow sided valley.

Main tributaries including the Vaalbankspruit and the Rietspruit that flow through the proposed site in a north, north-westerly direction join the Vaal.

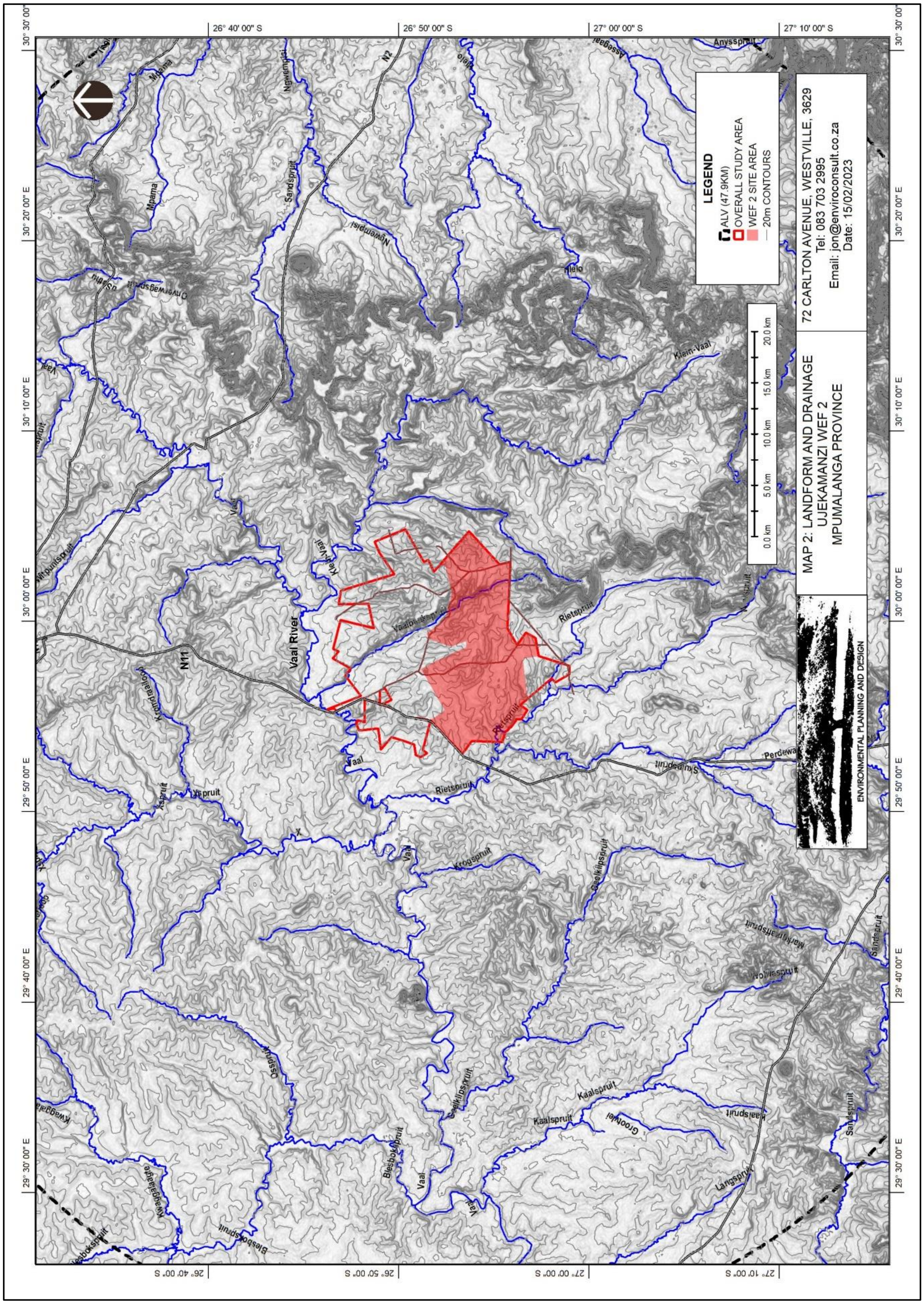
This results in the main ridgelines running through and adjacent to the study area running in a generally north, north-west direction.

The relatively broken landform described above could provide a large degree of screening particularly for smaller project elements. The wind turbines are likely to be located on or close to the ridgelines so screening these elements is likely to have a limited effect although where receptors are located in valley lines it could be significant.

Refer to Map 2, Landform and Drainage.

Plate 3, Gently rolling landform

Plate 4, The main drainage feature, the Vaal River


LEGEND
ALV (47.9KM)
OVERALL STUDY AREA
WEF 2 SITE AREA
20m CONTOURS
MAP 2: LANDFORM AND DRAINAGE
UJEKAMANZI WEF 2
MPUMALANGA PROVINCE
72 CARLTON AVENUE, WESTVILLE, 3629
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Email: jon@enviroconsult.co.za
Date: 15/02/2023
ENVIRONMENTAL PLANNING AND DESIGN

3.2.2 Nature of Development and Landcover

Land cover can broadly be divided into four main categories, including:

- Natural Grassland which is interspersed with areas of cultivation but is largely uninterrupted by cultivation. Grassland areas are largely used for cattle rearing;
- Arable agriculture / cultivation which in interspersed within the natural grassland matrix. Main crop types include sunflower seed production, sorghum, rye and potatoes;
- Settlement that occurs in the form of isolated homesteads throughout the study area that are generally related to agricultural uses. There is a tourism related establishment (Ons Pan) located within the Focus Area. This facility is focused around a small dam. The sign on the gate indicates that it is a catch and release fishing dam. The property includes a small number of Chalets and it is understood that fishing enthusiasts also camp at the dam.
- Settlement in the form of towns and villages is limited. The closest settlements include:
    - Amersfoort which is a small town on the N11 less than 1km to the west of the proposed focus area. Residential areas of the town are located on the eastern side facing towards the proposed site. Also on the eastern side of the settlement is a land fill site as well as industrial operations;
    - Ermelo which is also a small town is located at the junction of the N11, the N2 and the R39 approximately 25km to the north of the proposed focus area. Residential areas are located on the eastern side of the town facing towards the proposed site. This settlement is the district centre of the Sibande District; and
    - Daggakraal which is located approximately 16km to the south of the proposed focus area.

There are seven formally protected areas within the study area including:

- The Langgcarel Private Nature Reserve which is located approximately 7.5km to the north of the Focus Area;
- The Rietvlei Private Nature Reserve which is located approximately 30km to the north-west of the Focus Area; and
- The Majuba Nature Reserve which is located immediately adjacent to the Majuba Power Station approximately 20km to the south-west of the Focus Area.
- The Ahlers Private Nature Reserve that is located approximately 32km north of the Focus Area
- The Chrissiesmeer Protected Environment that is located approximately 42km to the north-north-east of the Focus Area;
- The Jericho Dam Nature Reserve that is located approximately 42km t the north-east of the Focus Area; and
- The Mabola Protected Environment that is located approximately 34.5km to the south-east of the Focus Area.

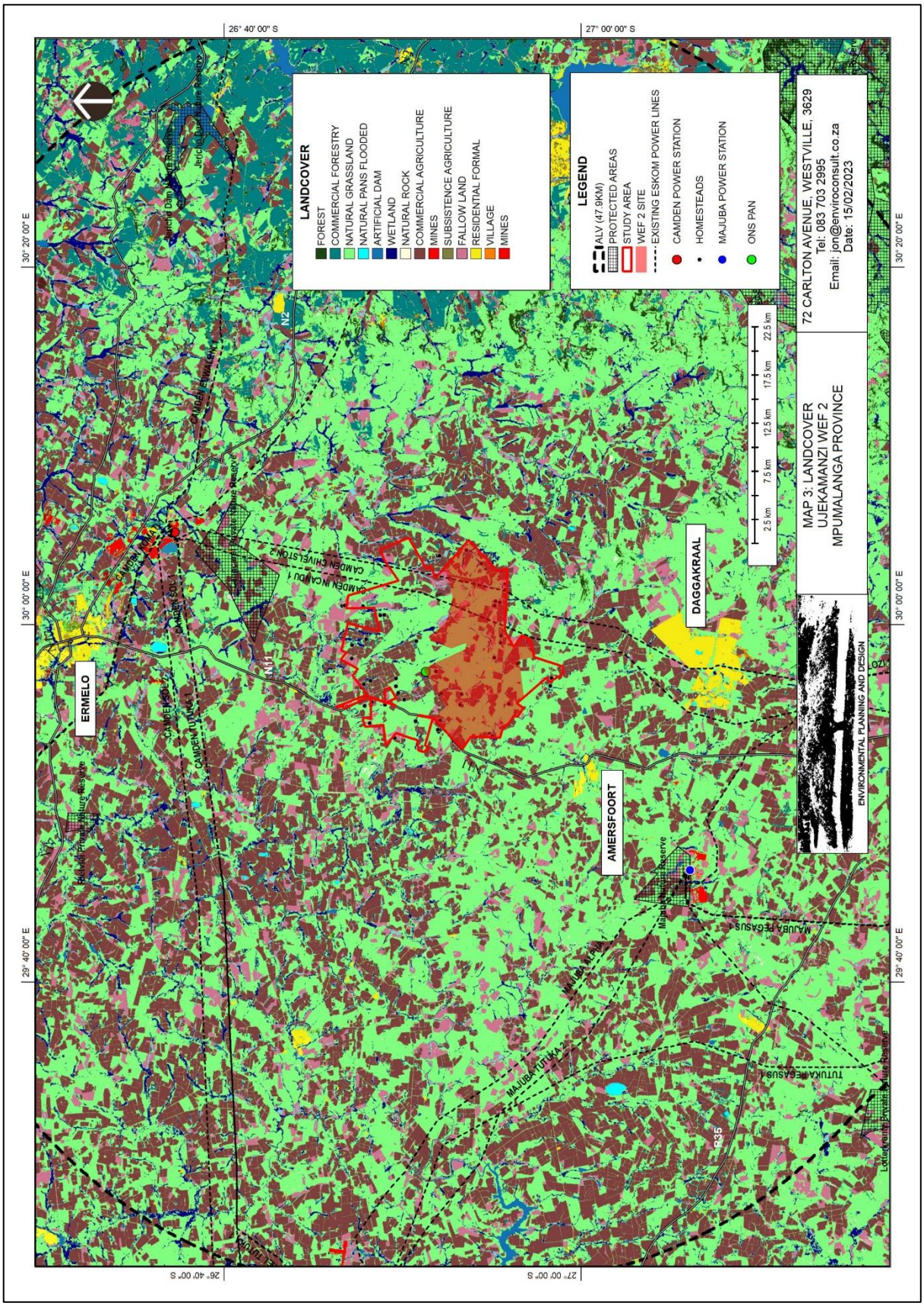
Local roads in the area include:

- The N11 and N2 that are major national distributor routes linking Ermelo to Volksruss in the south and Piet Retief in the east respectively. These are busy roads that carry business, tourism and local traffic. The N11 runs through and adjacent to the western side of the Focus Area;

- The R35 which links Bethal and areas to the north with Morgenzon and the N11 to the south. This regional distributor runs close to and through western sections of the proposed focus area;
- The R38 which links Bethal with the R39 and Standerton to the south west; and
- The R39 which links Morgenzon and Amersfoort to the south. At its closest this road runs approximately 8m south-west of the proposed focus area.

All of these roads are busy national / regional distributors that are likely to carry a full range of traffic types including tourism related traffic. However, it needs to be stated that tourism related traffic is most likely to be using these routes as a means to travelling to more distant attractions. It is unlikely that much of this traffic will view travelling through this area as a tourism experience.

Electrical infrastructure is relatively common in the area including coal fired power stations (Camden and Majuba) as well as low voltage and medium voltage lines in close proximity to roads.


LANDCOVER
FOREST
COMMERCIAL FORESTRY
NATURAL GRASSLAND
NATURAL PANS FLOODED
ARTIFICIAL DAM
WETLAND
NATURAL ROCK
COMMERCIAL AGRICULTURE
MINES
SUBSISTENCE AGRICULTURE
FALLOW LAND
RESIDENTIAL FORMAL
VILLAGE
MINES
LEGEND
ALV (47.9KM)
PROTECTED AREAS
STUDY AREA
WEF 2 SITE
EXISTING ESKOM POWER LINES
CAMDEN POWER STATION
HOMESTEADS
MAJUBA POWER STATION
ONS PAN
2.5 km
7.5 km
12.5 km
17.5 km
22.5 km
MAP 3: LANDCOVER
UJEKAMANZI WEF 2
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Date: 15/02/2023
ENVIRONMENTAL PLANNING AND DESIGN
ERMELO
AMERSFOORT
DAGGAKRAAL
N11
N2
R35
26° 40' 00" S
27° 00' 00" S
30° 20' 00" E
30° 00' 00" E
29° 40' 00" E

Other land cover includes heavy industry including mining operations and electricity generation. However, these uses are generally located some distance from the proposed focus area. These industrial uses are generally large, isolated, individual industrial operations within the surrounding rural landscape.

Major high voltage overhead power lines cross the proposed focus area including:

- The Camden Chivelston 2 400kV power line; and
- The Camden Incandu 1 400kV power line.

These power lines run through the eastern section of the focus area.

Refer to Map 3, Landcover.

3.2.3 Vegetation Patterns

The following vegetation types are evident within the proposed study area;

a) Natural vegetation that is generally associated with natural areas indicated on Map 3 (Landcover);
b) Agricultural vegetation that is comprised of cultivated fields as indicated on Map 3 and vegetation which is largely comprised of alien trees and shrubs around homesteads and on field boundaries; and
c) Vegetation associated with settlement areas which is generally comprised of alien vegetation.

a) Natural Vegetation

Mucina and Rutherford[1] indicate that the predominant vegetation types within the vicinity of the proposed site include:

- Soweto Highveld Grassland;
- Amersfoort Highveld Clay Grassland; and
- Paulpietersburg Moist Grassland

Whilst botanically these vegetation types are different, from a visual perspective, they are all similar, appearing as monocultures of low grasses. This helps to create an open landscape within which vegetation contributes very little towards Visual Absorption Capacity.

b) Agricultural Vegetation

Agriculture in the proposed study area is largely arable crop production including sunflower seed, sorghum, rye and potatoes.

Both Sorghum and Sun Flowers grow to approximately 1.5m. This means that views from areas planted with crops are likely to be screened as the crops reach their ultimate height but after harvesting and during the early growth stage, views are likely to be open.

Within the agricultural areas there are small patches of alien species including gum trees on field edges, along roads and around homesteads. There are also patches of woody vegetation along main drainage lines.

[1] The Vegetation of South Africa, Lesotho and Swaziland

In visual terms therefore, agricultural areas generally contribute to an open landscape with occasional screening.

c) Vegetation Associated with Settlement Areas

This largely includes ornamental and alien shrubs and trees. Within and adjacent to settlement areas this vegetation can provide a large degree of screening.

3.2.4 LANDSCAPE CHARACTER

The affected landscape can be divided into the following general character types:

Rural Landscape Areas. This is the type of landscape that dominates the affected landscape. It is typified by relatively uniform rolling topography that is covered by a matrix of arable agriculture set in a framework natural grassland.

Due to the relatively low topography, and generally low vegetation, it is an open landscape over which long views are possible particularly when the viewer is located on the summit of a ridgeline.

Within this general pattern homesteads are located that are made obvious due to their associated alien and ornamental vegetation.

There are also stands of alien trees many of which are Eucalyptus that are largely located along property boundaries and unused agricultural land.

Urban Landscape Areas those are generally densely developed residential areas with small commercial areas. There are also small areas of industry also associated with urban areas. VAC is generally high, with views of the surrounding landscape generally only possible from urban edges.

Industrial Landscape Areas Mpumalanga is known for its mining industry as well as other heavy industrial operations. These industries generally create their own visual presence that can over-ride surrounding characteristics. The closest large scale industrial operation is the Camden Power Station approximately 18km to the north-east of the Focus Area. There are also mining operations to the north and south of Camden.

Other large scale industrial operations include the Majuba Power Station which is located approximately 22km to the south-west of the Focus Area.

Due to distance, these activities have no apparent influence on landscape character in the vicinity of the proposed site. They may however influence people's perception of landscape character for some of the longer views particularly for the Wind Energy Facility.

Plate 5, Rural Landscape Character Zone

This landscape is typified by low rolling hills and a matrix of natural grassland and arable crop production.

Plate 6, Urban Landscape Character Zone (Amersfoort)

Plate 7, Industrial Landscape Character Zone
Large scale industry (Majuba Power Station) is located approximately 22km from the proposed Study Area.

3.3 VISUAL RECEPTORS

3.3.1 Definition

Visual Receptors are defined as "individuals and / or defined groups of people who have the potential to be affected by the proposal".

The significance of a change in a view for a visual receptor is likely to relate to use.

Uses such as guest houses, recreation and tourism related areas are likely to rely on the maintenance of an outlook for successfully attracting guests and users. Residential areas could depend on outlook for the enjoyment of the area by residents and for maintaining property values. A route that is particularly important for tourism may also be dependent on outlook for the maintenance of a suitable experience for users.

3.3.2 Identified visual receptors

This section is intended to highlight possible Receptors within the landscape which due to use could be sensitive to landscape change.

- Area Receptors may include;
    - The towns of **Ermelo and Amersfoort;**
    - The **Ons Pan Fishing Attraction**; and
    - Protected Areas.

Plate 8, The Urban Area of Amesfoort

Plate 9, The Ons Pan Fishing Attraction

- Point Receptors that include;
    - There are a number of **Local Farmsteads and Homesteads** located both within the focus area and the surrounding landscape.

Plate 10, Homesteads including farm workers houses

Plate 11, Homesteads including Farm Homesteads

- Linear Receptors or routes through the area that include;
    - **The N11, the R35 and the unsurfaced local roads that that run through the study area.** All of these are used mainly by local people with little tourism / recreational importance.

Plate 12, The N11

Plate 13, Unsurfaced Local Roads

3.4 LANDSCAPE AND RECEPTOR SENSITIVITY

It is difficult to define hard and fast criteria for assessment of subjective issues. In order to provide both consistency and transparency to the assessment process, the table below indicates the criteria that are proposed to guide the judgement as to the sensitivity of the landscape character areas and the various visual receptors in their interaction with the identified LCAs.

SIGNIFICANCE	LCA	RECEPTORS
Low	Areas not recognised as having specific landscape value. **The Urban and the Industrial LCAs;**	Viewers' attention not focused on landscape. These include: • **Residents of urban areas**
Medium	Landscape value is recognised locally, but is not protected; the landscape is relatively intact, with a distinctive character; and the landscape is reasonably tolerant of change. These areas include: • **The Rural LCA.**	Viewers' attention may be focused on landscape. These include: • **Homesteads; and** • **Users of main and local roads.**
High	The qualities for which the landscape is valued are in a good condition, with a clearly apparent distinctive character. This distinctive character is susceptible to relatively small changes. • **Protected Areas.**	Viewer's attention very likely to be focused on landscape, e.g. people experiencing views from important landscape features of local physical, cultural or historic interest and beauty spots. Large number of viewers and/or location in a highly valued landscape could elevate viewer sensitivity to the highest level. These include: • **Visitors to the protected areas; and** • **Visitors to the Ons Pan Fishing Attraction.**

4 THE NATURE OF POTENTIAL VISUAL IMPACTS

4.1 THE NATURE OF LIKELY IMPACTS

4.1.1 General

Landscape and Visual Impacts could include general degradation of the Landscape Character Areas due to the development that may detract from the existing character as well as change of view for affected people and / or activities:

a. Generally landscape change or degradation. This is particularly important for protected areas where the landscape character might be deemed to be exceptional or rare. However it can also be important in non-protected areas particularly where landscape character is critical to a specific broad scale use such as tourism areas or for general enjoyment of an area. This is generally assessed by the breaking down of a landscape into components that make up the overall character and understanding how proposed elements may change the balance of the various elements. The height, mass, form and colour of new elements all help to make new elements more or less obvious as does the structure of an existing landscape which can provide screening ability or texture that helps to assimilate new elements. This effect is known as **Visual Absorption Capacity (VAC).**

b. Change in specific views within the affected area from which the character of a view may be important for a specific use or enjoyment of the area.

    - Visual intrusion is a change in a view of a landscape that reduces the quality of the view. This can be a highly subjective judgement. Subjectivity can be removed as far as is possible by classifying the landscape character of each area and providing a description of the change in the landscape that will occur due to the proposed development. The subjective part of the assessment is to define whether the impact is negative or positive. Again to make the assessment as objective as possible, it is proposed that the judgement is based on the level of dependency of the use in question on existing landscape characteristics.

    - Visual obstruction is the blocking of views or foreshortening of views. This can generally be measured in terms of extent.

    Due to the nature of the proposed development, visual impacts are expected to relate largely to intrusion.

4.1.2 Effects of Distance, Vegetation, Other Development, Topography and Weather

Whilst the initial study area might be set at a distance of 22.6km from the proposed site boundary as this is the theoretical limit of the area that might be affected, it should be noted that the majority of elements associated with the proposed development are highly unlikely to be visible to visually obvious to their ALV.

In reality these distances will be reduced by:

- Landform, vegetation and other structures that may screen views;

- Weather conditions that limit visibility. This could include hazy conditions during fine weather as well as mist and rain;
- Scale and colour of individual elements making it difficult to differentiate structures from the background; and
- The fact that as the viewer gets further away, the apparent height of visible elements reduce. At the limit of visibility it will only be possible that the very tip of an object may be visible. This reducing scale means that an object will become increasingly more difficult to see as the distance from it increase.

4.2 THE LIKELY NATURE OF VIEWS OF THE WEF

The turbines associated with the proposed development are likely to be by far the largest structures and are therefore likely to be the most obvious elements that are visible for the greatest distance.

Two existing windfarm projects in the Western Cape (South Africa) were visited during 2017 in order that visual effects could be noted for a similar project.

One facility is close to Gouda at the foot of the Cederberg mountain range and the other is located at Hopefiled which is close to the West Coast National Park.

The Gouda wind farm is located at the base of the Cederberg and from the majority of viewpoints is seen against the backdrop of the mountain range. This therefore provides an indication of the nature of likely views of the proposed development when it is viewed against landform. The proposed project when viewed from the south will be seen in a similar context against the Langeberg.

The Hopefield facility however, is located on a ridgeline, is seen breaking the skyline from most areas in the surrounding region. It therefore is perhaps most relevant to views of the proposed WEF.

Observations of these existing wind farms during the site visit include;

- Both existing wind farms could be seen from a distance more than 30km.
- With the sun behind the turbines and the face of structures facing the viewer in shadow, both facilities were not obvious and tended to merge with their background. The Gouda facility with a permanent backdrop that was also in shadow tended to merge with its background under all weather conditions, whereas the Hopefield facility tended to merge best when the sky was darker and was slightly more obvious with a lighter sky because it breaks the sky line from most viewpoints.
- From close quarters, estimated at less than 2 - 4km, the WEF turbines dominated the view, the scale and detail of individual structures was obvious and due to this as well as the extent of the facilities the wind farms dominated the local landscape character.
- From medium distance, estimated at up to 8 – 15km the WEF structures provided an obvious focal point in the landscape that is difficult to ignore. The exception to this is where the wind farm structures are seen in shadow against the back drop of land form. In these circumstances the wind farm tends to blend with the backdrop and can be difficult to make out. When viewed from above at this range, the underlying vegetation and agricultural pattern is legible running through and around the wind farm.
- At a distance in excess of 15 – 20km the WEF structures can be easy to miss in the landscape particularly if they are in shadow and cast against the landform. They

become more easily visible if seen in profile above the skyline and if they are seen with the sun reflecting off the visible face.
- If there is line of sight, at 30km WEF turbines are still likely to be visible, however they are not obvious as their apparent scale is such that they become difficult to see.

Lighting conditions and particularly reflection from spinning rotors particularly can exacerbate the effects noted.

In addition to the broader visual effects, it was obvious from the site visit that the structures associated with the Gouda facility were constructed of concrete with no other obvious finish, whereas the structures associated with the Hopefield facility were constructed of steel that was painted bright white. Whilst it was obvious that the concrete structures did reflect light, from comparing the reflection of the turbine housing at the head of the structure with the degree of reflection from the structure itself, it was obvious that the reflection from the concrete structures was noticeably less than the painted steel turbine housing.

At Gouda, the facility was still under construction and the following was obvious;
- A crane was in the process of lifting blades into position for fixing.
- The contractor's camp, lay down area and workshop were in operation close to the site access.
- Various contractors were evident in the process of commissioning the turbines.

Whilst these operations were obvious, the works were generally small isolated operations with no major visual impact. It is accepted that this facility was nearing completion and it is likely that initially, site clearing, storage and concrete works were possibly more obvious from close quarters.

Internationally research has been undertaken by planning authorities to help guide the development of Wind Energy Facilities (WEFs). In Scotland, which is a country that has extensive natural upland areas that have been subject to large scale WEF development, the Scottish Executive, Development Department have published numerous Planning Advisory Notes (PANs) to help guide this type of development. Their PAN 45, describes public perceptions towards WEFs based on distance. These perceptions are indicated in the table below:

General Perception of a Wind Farm in an Open Landscape

Distance	**Visual Perception of Turbines**
Up to 4 km (Short Distance)	Likely to be a prominent feature
4-10 km (Mid Distance)	Relatively prominent
10-20 km (Long Distance)	Only prominent in clear visibility – seen as part of the wider landscape
20-30+ km	Only seen in very clear visibility – a minor element in the landscape

(**Extract from Scottish Executive PAN 45**)

PAN 45 clearly indicates that whilst a WEF may be visible over an extensive area, it is only mid to short distance views (up to 10km) over which they are generally prominent.

Observations of the Gouda and Hopefield WEFs strongly support these conclusions.

Refer to plates 13 to 18 inclusive for views of the existing WEFs (Hopefield and Gouda) illustrating the visual effects indicated above.

4.3 SHADOW FLICKER

Shadow flicker occurs when wind turbine blades cast a shadow on the surrounding area when the blades pass in front of the sun. The location and occurrence of the shadow effect depends on the time of year, time of day and the position of the sun in the sky. The shadow effects main disturbance area is any unshaded windows of buildings, especially residential areas where people would be most likely to experience these effects.

Shadow flicker effects will only occur under certain conditions:

- During daylight hours;
- When the sun is shining, no overcast or foggy conditions;
- When wind turbine is in operation or spinning; and
- In areas that are affected by the shadow of the turbines.

Various sources indicate that a discernible shadow flicker effect may be reported to occur on properties within ten turbine rotor diameters from the wind turbine.

In terms of the proposal under consideration with a rotor diameter in the order of 200m, this would mean that shadow flicker may be possible within 2,000m of the turbines.

Plate 14, Hopefield Wind Farm from approximately 9km.
Turbines are obvious above the skyline.

Plate 15, Gouda Wind Farm from approximately 30km. Turbines just visible but are in shadow and viewed against the landform and so are not obvious.

Plate 16, Hopefield Wind Farm from its immediate vicinity. The turbines dominate views.

Plate 17, Gouda Wind Farm from its immediate vicinity. The turbines dominate views.

Plate 18, Gouda Wind Farm laydown area.

Plate 19, Gouda Wind Farm, turbines being erected with the use of a crane.

5 LANDSCAPE AND VISUAL SENSITIVITY

5.1 GENERAL

Even though the ALV of larger elements extends further than existing protected areas, considering the slim nature of these elements and the likely visual effects of distance, it is highly unlikely that the proposed project will be visible.

The affected landscape is also similar in nature to much of the region, Therefore there are no rate landscapes that deserve protection.

It appears therefore that the key issue is to ensure that impacts on receptors are minimised.

The most sensitive receptors are likely to include:

a) Protected Areas;
b) The Ons Pan Fishing Attraction;
c) The N11;
d) The N2;
e) The R35:
f) The urban area of Ermelo;
g) The urban area of Amersfoort; and
h) Local homesteads.

This section highlights the areas of the site that should be focused on in order to minimise impacts on these receptors.

5.2 NO GO AREAS

The directly affected landscape is neither protected nor is it rare so from a landscape perspective there are no no-go areas.

5.3 DEVELOPMENT SENSITIVITY

Sensitivity to development relates to:

- Protection of natural features; and
- Guiding development away from areas of the site that would make it most obvious to surrounding sensitive receptors.

5.3.1 Wind Energy Facility

The elements associated with the proposed WEF will be visible to varying degrees with the proposed turbines visible over an extensive area.

It is unlikely to be possible to hide the proposed turbines, however, whilst they are likely to be visible, the existing landscape pattern will still be obvious beneath them for all but the closest views when the turbines themselves are likely to dominate.

The approach therefore is to set back elements sufficiently from receptors so that the existing landscape pattern remains obvious and various ground level ancillary elements are not obvious.

A key consideration is the potential for shadow flicker. Using internationally adopted guidelines will see the turbines set back approximately 2km from homesteads. This shadow

flicker risk area is indicated on sensitivity mapping. If it is necessary to develop within these areas, it is recommended that a Shadow Flicker study is undertaken.

Normally, it would be recommended to keep development off ridgelines as this can make it more obvious over a distance. When dealing with wind turbines however, the height of the turbine can be critical in terms of performance and any potential visual benefit is marginal. Maintaining ridgelines free of ancillary infrastructure is however recommended.

The directly affected landscape is neither protected nor is it rare so from a landscape perspective there are no no-go areas.

The sensitivity rationale that has been used is indicated in the descriptions of each area, it relates to:

- Protection of natural features; and
- Guiding development away from areas of the site that would make it most obvious to surrounding sensitive receptors.

Highly Sensitivity Areas include:

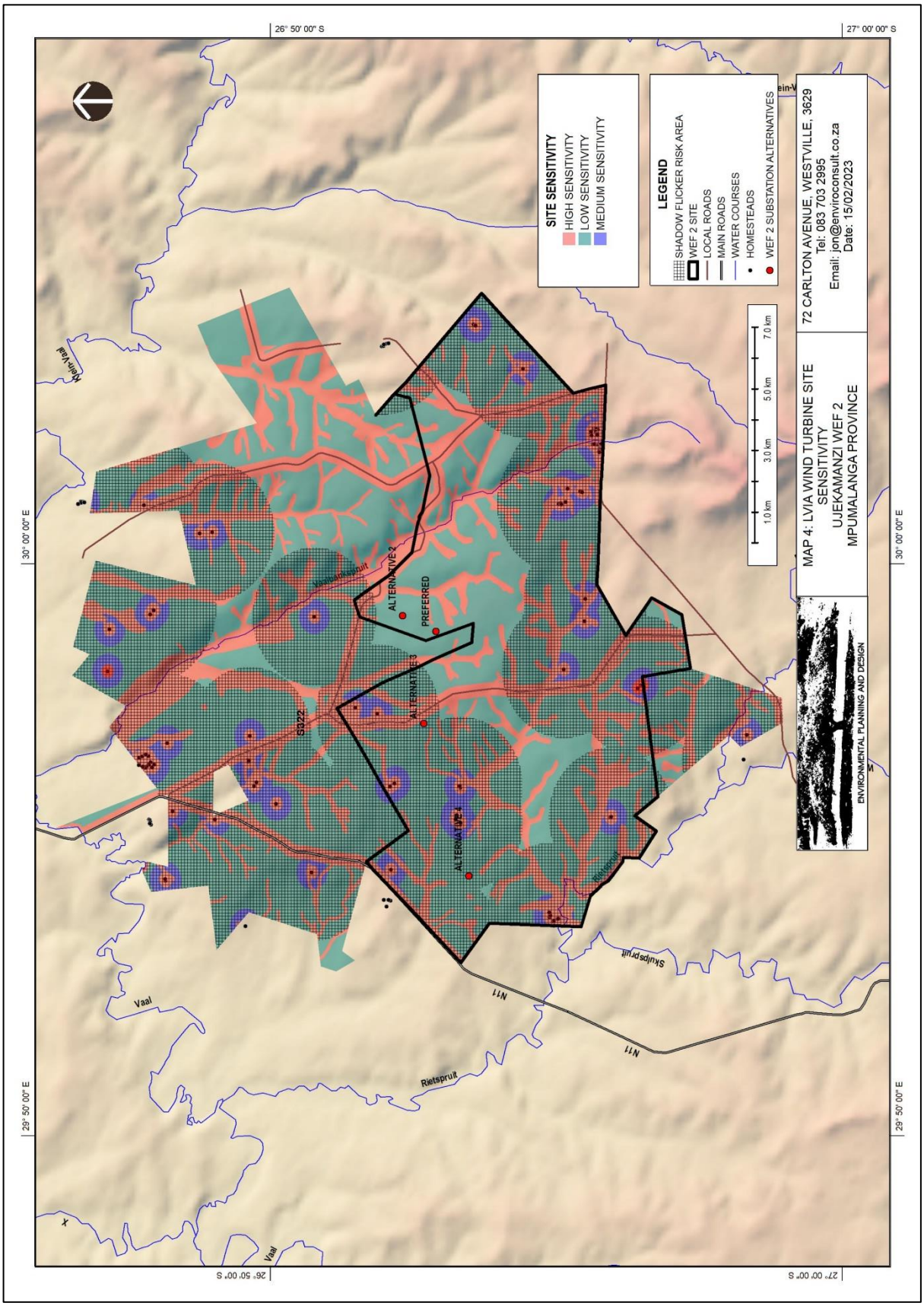
- Areas immediately surrounding settlement and homesteads development of which is likely to significantly change the character of views for residents. A 200m buffer is proposed which should be sufficient to ensure that there is separation between turbine blades and structures. It is possible that receptors (owners /residents) have no concern regarding the development of these areas, in which case the sensitivity rating will reduce; and
- Corridors beside the main roads that could be affected including the N11 and local roads. This is deemed sensitive because development in this corridor is likely to be highly obvious and could be distracting to people travelling along the roads the proposed 200m corridor should be sufficient to ensure that there is a minimum 100m between moving blades and the roads.
- Natural landscape features which on this site are primarily watercourses and wetlands. A buffer equal to the wetland specialists recommendation is proposed. The purpose is to maintain these natural landscape features throughout the life of the proposed project.

Medium Sensitivity Areas include:

- A 500m buffer between homesteads and turbine locations is recommended. This should be sufficient to ensure that development does not totally dominate views;

Low Sensitivity Areas include:

- Valley side slopes the development of which is likely to make the project least obvious from surrounding areas. The fact that development may be focused on areas with relatively low sensitivity does not preclude the necessity for mitigation.


26° 50' 00" S
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29° 50' 00" E
SITE SENSITIVITY
HIGH SENSITIVITY
LOW SENSITIVITY
MEDIUM SENSITIVITY
LEGEND
SHADOW FLICKER RISK AREA
WEF 2 SITE
LOCAL ROADS
MAIN ROADS
WATER COURSES
HOMESTEADS
WEF 2 SUBSTATION ALTERNATIVES
1.0 km
3.0 km
5.0 km
7.0 km
ALTERNATIVE 2
PREFERRED
ALTERNATIVE 3
ALTERNATIVE 4
S322
N11
Vaal
Rietspruit
Skulpspruit
MAP 4: LVIA WIND TURBINE SITE SENSITIVITY
UJEKAMANZI WEF 2
MPUMALANGA PROVINCE
72 CARLTON AVENUE, WESTVILLE, 3629
Tel: 083 703 2995
Email: jon@enviroconsult.co.za
Date: 15/02/2023
ENVIRONMENTAL PLANNING AND DESIGN

6 IDENTIFICATION AND INITIAL ASSESSMENT OF ISSUES

6.1 IMPACTS TO BE CONSIDERED

Possible impacts identified include:

a) Potential change to the rural landscape;
b) Potential visual impacts as experienced by visitors to Protected Areas
c) Potential visual impacts as experienced by visitors to the Ons Pan;
d) Potential visual impacts as experienced by users of adjacent local roads particularly users of the N11, the N2, and the R39;
e) Potential visual impacts as experienced by residents of homesteads;
f) Potential visual impacts as experienced by residents of local settlements particularly residents on the south-eastern edge of Amersfoot, Ermelo and Daggakraal;
g) Lighting impacts; and
h) Potential Shadow Flicker impacts particularly affecting local homesteads.

In addition to the issues identified above, the applicant has requested that the project team consider four alternative locations for the necessary on site substation.

Subject to the proposed layout and the visibility of the proposed project, these issues will be considered in the context of possible degradation of Landscape Character Areas, visual effects identified and possible cumulative influence of other possible projects that exist or are planned in the vicinity.

At this stage of the project there is no indication of the proposed layout or detailed specification. Possible impacts can therefore only be discussed at a generic level.

6.2 SIGNIFICANCE OF ISSUES

Sensitivity mapping provides an indication of the likelihood of significant issues, however, without an indication of the possible location and layout of the project it is not possible to be confident regarding possible significance of impacts.

6.3 INITIAL ASSESSMENT OF ISSUES

6.3.1 Landscape Change

Potential Impact			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Potential change to the rural landscape	Direct impacts: **Loss of rural landscape**. The landscape is not protected. The character is also relatively common within the region. Indirect impacts: No indirect impacts	Local	None identified at this stage
Description of expected significance of impact Without an indication of the possible location and layout of the project it is not possible to be confident regarding possible significance of impacts.			

The industrialisation of the landscape could be in keeping with surrounding development patterns in that it typically consists of contiguous areas with rural character within which relatively large scale industrial elements are located. The proposed development will result in a reduction of rural landscape.
Gaps in knowledge & recommendations for further study The proposed development layout. **Recommendations with regards to general field surveys** Assessing the extent of change that will be obvious.

6.3.2 Impact on Protected Areas

Potential Impact			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Potential visual impact experienced by visitors to Protected Areas	**<u>Direct impacts:</u>** The initial assessment indicates that the project could be visible to: The Langgcarel Private Nature Reserve (19km); The Rietvlei Private Nature Reserve (36km); The Ahlers Private Nature Reserve (41km); and The Majuba Nature Reserve (20km) It is likely that the Majuba Reserve could be worst affected with turbines being visible from approximately half of the reserve. This Majuba Reserve is located adjacent to the Majuba Power Station which is likely to be highly obvious from the reserve. Given the distances involved, it is unlikely that the project will be visually obvious from other protected areas. **<u>Indirect impacts</u>**: Possible reduction in visitor numbers	Regional	None identified at this stage
Description of expected significance of impact The industrialisation of views of the landscape from within protected areas.			

It is possible that views from within the Majuba Nature Reserve could be further industrialised.

It has to be assumed that people visit the reserve for its tranquil natural character. If the proposed development should change this situation, it could be a significant issue.

Other protected areas are sufficiently far away from the proposed development for visual impacts to be negligible.

Gaps in knowledge & recommendations for further study
The proposed development layout.

Recommendations with regards to general field surveys
Assessing the extent of the proposed development that is likely to be visible from within the Majuba Nature Reserve .

6.3.3 Ons Pan Fishing Attraction

Potential Impact			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Potential visual impact experienced by visitors to Silver Stream Reserve	**Direct impacts:** Loss of visitor experience of rural landscape that is no doubt enhanced by view over the water body. The view could be industrialised by the proposed development. **Indirect impacts**: Possible reduction in visitor numbers	Local	None identified at this stage

Description of expected significance of impact
The industrialisation of views of the landscape within the attraction.

Without an indication of the possible location and layout of the project it is not possible to be confident regarding possible significance of impacts. However, given that the dam is located partly within the development area, it has to be assumed that wind turbines and infrastructure will be visually obvious.

It has to be assumed that people partly visit the facility for its tranquil rural nature. However, the attraction is primarily to fish a well-stocked dam. As long as the fishing is good, it is possible that its popularity will remain.

The fact that the reserve is not officially protected could also reduce the significance of the possible impact.

Gaps in knowledge & recommendations for further study
The proposed development layout.

Recommendations with regards to general field surveys
Assessing the proximity and the extent of the proposed development that is likely to be visible from within the facility.

6.3.4 Impact on Major Roads

Potential Impact			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Potential visual impacts as experienced by users of adjacent local roads particularly users of the N11, the N2, and the R39	Direct impacts: **Industrialisation of views from roads**. Indirect impacts: **No indirect impacts**	Local	None identified at this stage
Description of expected significance of impact The landscape is neither protected or of a particularly high quality. The landscape character is also relatively common in the region. Views over large scale industrial development are relatively common from roads. Without an indication of the possible location and layout of the project it is not possible to be confident regarding possible significance of impacts. However, as long as the proposed development does not dominate views from roads (outside high sensitivity area), the change in view is unlikely to have a high significance. It is likely that views of the development from the N11 as it passes close to the proposed site will be most obvious. Also, given distances to the other roads it is unlikely that the proposed development will be highly obvious.			
Gaps in knowledge & recommendations for further study The proposed development layout. **Recommendations with regards to general field surveys** Assessing the extent of change that will be obvious.			

6.3.5 Impact on Local Unsurfaced Roads

Potential Impact			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Potential visual impacts as experienced by users of local unsurfaced roads that run through and close to the proposed development	Direct impacts: **Industrialisation of views from roads**. Indirect impacts: **No indirect impacts**	Local	None identified at this stage
Description of expected significance of impact The landscape is neither protected or of a particularly high quality. The landscape character is also relatively common in the region.			

The proposed development is likely to be highly visible from the majority of unsurfaced roads that run through and close to the proposed development.

These roads are likely to be largely used by local people to access their properties and by agricultural vehicles. Affected people are likely to be more concerned with the productivity of their land than aesthetic issues.

Gaps in knowledge & recommendations for further study
The proposed development layout.

Recommendations with regards to general field surveys
Assessing the extent of change that will be obvious.

6.3.6 Homesteads

Potential Impact			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Potential visual impacts as experienced by residents of homesteads	Direct impacts: **Industrialisation of views from homesteads**. Indirect impacts: **Possible loss of income from homesteads that have a tourism related use.**	Local	None identified at this stage

Description of expected significance of impact
It is possible that residents of homesteads that have a purely agricultural use may not be concerned regarding possible change in view due to the proposed development. However, for residents of homesteads with a tourism related use, subject to the proximity and extent of the proposed development that is visible, this could be an important issue.

Without an indication of the possible location and layout of the project it is not possible to be confident regarding possible significance of impacts.

Gaps in knowledge & recommendations for further study
The proposed development layout.

Recommendations with regards to general field surveys
Assessing the extent of change that will be obvious.

6.3.7 Settlements

Potential Impact			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Potential visual impacts as experienced by residents of local settlements.	Direct impacts: **Industrialisation of views from urban areas**. Indirect impacts:	Regional	None identified at this stage

	Possible loss of property value due to change in outlook.		

Description of expected significance of impact
Without an indication of the possible location and layout of the project it is not possible to be confident regarding possible significance of impacts. However, views of the proposed development are likely to be largely screened by landform, vegetation and structures from the majority of settlement areas. Views could be possible from a limited number of dwellings on settlement edges, however, it is likely that these will be seen at a distance.

It is unlikely therefore that views of the proposed development as seen from residential areas will be a significant issue.

Gaps in knowledge & recommendations for further study
The proposed development layout.

Recommendations with regards to general field surveys
Assessing the extent of change that will be obvious.

6.3.8 Lighting

Potential Impact			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Lighting Impacts.	Direct impacts: **Light pollution affecting areas that would otherwise be dark at night**. Indirect impacts: **No indirect impact.**	Local	None identified at this stage

Description of expected significance of impact
Lighting is likely to be required for security, for aircraft safety, for maintenance and for the safety / convenience of workers.

There are other large scale industrial operations in the surrounding landscape including two power stations and mines, that create islands of light in the night time sky.

There are also numerous homesteads that create low levels of light.

It is possible to mitigate lighting impacts to a large degree through design, the use of motion sensors for security lighting and ensuring that lighting is only used in areas where workers are located / working.

Without an indication of the possible location and layout of the project it is not possible to be confident regarding possible significance of impacts. However, if suitable mitigation measures are used, it is unlikely that lighting impacts will be significant.

Gaps in knowledge & recommendations for further study
The proposed layout and the nature of proposed lighting.

Recommendations with regards to general field surveys
Assess existing levels of impact.

6.3.9 Shadow Flicker

Potential Impact			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Shadow flicker Impacts.	Direct impacts: **Shadow flicker affecting residents of homesteads close to turbines**. Indirect impacts: **Nuisance and health impacts for residents.**	Local	None identified at this stage
Description of expected significance of impact Shadow flicker could affect residents of homesteads close to turbines particularly in the early morning and late afternoon when the sun is low in the sky and during clear weather. Shadow flicker may affect residents within distances ten times the rotor diameter. Shadow flicker can be mitigated through screening and / or preventing rotors turning during high risk periods. The likelihood of shadow flicker can be assessed using specialist software. Without an indication of the possible location and layout of the project it is not possible to be confident regarding possible significance of impacts. However, if suitable mitigation measures are used, it is unlikely that glare impacts will be significant.			
Gaps in knowledge & recommendations for further study The proposed layout. **Recommendations with regards to general field surveys** Locate turbines within 10x the proposed rotor diameter of turbines: and Undertake a detailed assessment using specialist software as necessary.			

6.3.10 Impact of Alternative On-Site Substations

Potential Impact			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Industrialisation of the rural landscape.	Direct impacts: **In addition to being obvious to receptors, the location of the on-site substation could require a greater or lesser extent of over head power line to connect to the Main Transmission Substation (MTS)**	Local	None identified at this stage

	Indirect impacts: **None.**		

Description of expected significance of impact

From the perspective of likely visibility of the substation to identified receptors, all alternative locations are some distance from receptors. There is no favoured alternative from this perspective.

The preferred substation location is significantly closer to the likely location of the MTS which should be located close to the existing Eskom 400kV over head power line. **The preferred substation location is therefore favoured from a landscape and visual perspective as this should minimise the extent of over head power line required to make the necessary connection.**

There is no preference regarding remaining substation locations.

Gaps in knowledge & recommendations for further study

The proposed layout.

Recommendations with regards to general field surveys

7 RECOMMENDED ASSESSMENT METHODOLOGY

7.1 REQUIREMENTS IN ACCORDANCE WITH THE WESTERN CAPE GUIDELINES

The criterion recommended by the Western Cape Guidelines for justification of level of input for a VIA is the expected level of visual impact. This categorisation is derived from the following matrix;

Type of environment	Type of development (see Box 3) Low to high intensity				
	Category 1 development	Category 2 development	Category 3 development	Category 4 development	Category 5 development
Protected/wild areas of international, national, or regional significance	Moderate visual impact expected	High visual impact expected	High visual impact expected	Very high visual impact expected	Very high visual impact expected
Areas or routes of high scenic, cultural, historical significance	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected	Very high visual impact expected
Areas or routes of medium scenic, cultural or historical significance	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected
Areas or routes of low scenic, cultural, historical significance / disturbed	Little or no visual impact expected. Possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected
Disturbed or degraded sites / run-down urban areas / wasteland	Little or no visual impact expected. Possible benefits	Little or no visual impact expected. Possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected

Category 1 development:
e.g. nature reserves, nature-related recreation, camping, picnicking, trails and minimal visitor facilities.

Category 2 development:
e.g. low-key recreation / resort / residential type development, small-scale agriculture / nurseries, narrow roads and small-scale infrastructure.

Category 3 development:
e.g. low density resort / residential type development, golf or polo estates, low to medium-scale infrastructure.

Category 4 development:
e.g. medium density residential development, sports facilities, small-scale commercial facilities / office parks, one-stop petrol stations, light industry, medium-scale infrastructure.

Category 5 development:
e.g. high density township / residential development, retail and office complexes, industrial facilities, refineries, treatment plants, power stations, wind energy farms, power lines, freeways, toll roads, large-scale infrastructure generally. Large-scale development of agricultural land and commercial tree plantations. Quarrying and mining activities with related processing plants.

From reference to the categorisation of development included in the Western Cape Guidelines as indicated in the table above, the proposed development if standing on its own should be considered as a Category 5 development.

Based on the predicted visual impacts described in this report, and on the basis that the proposed new facility, it seems that the proposed development could have significant local impacts. Because of this it is proposed that a Level 4 Assessment is undertaken in accordance with the Western Cape Guidelines.

In accordance with the Western Cape Guidelines, a Level 4 Assessment requires the following input:

- Verification of issues raised in scoping phase, and site visit;
- Description of the receiving environment and the proposed project;
- Establishment of view catchment area and receptors;
- Indication of potential visual impacts using established criteria;
- Inclusion of potential lighting impacts at night;
- Description of alternatives, mitigation measures and monitoring programmes;
- Complete 3D modeling and simulations, with and without mitigation; and
- Review by independent, experienced visual specialist (if required).

7.2 DETAILED METHODOLOGY

As indicated above, confirmation of the following is required in order to investigate and finalise the issues and impacts highlighted by this initial LVIA scoping exercise:

a) Confirmation of the layout of the facility.

The following methodology will be used in preparation of the LVIA report.

Identification of issues raised in scoping phase, and site visit

Likely issues have already been identified in this scoping analysis. These issues will be verified from detailed analysis of the proposed development plan as well as responses from stakeholders to the scoping documentation.

It is possible that additional impacts might be identified form the site visit and from comments by stakeholders.

Description of the receiving environment and the proposed project

The receiving environment has been described and categorised. This has been verified from a site visit.

Establishment of view catchment area, view corridors, viewpoints and receptors

Zones of theoretical visibility will be prepared and visual receptors have been established from GIS analysis. These will be verified from a site visit. Existing large scale industrial development should help to provide a useful guide as to likely visibility of the proposed development.

Viewpoints will be identified from a site visit to represent views of visual receptors.

Indication of Potential Visual Impacts using Established Criteria

Given that the existing landscape character is a relatively cohesive rural landscape, it will be assumed that affected receptors are likely to prefer views of a rural landscape rather than an industrial landscape

Criteria will include:

- The extent of likely industrialisation as seen by each receptor; and
- The sensitivity of each receptor to change.

Impacts will be assessed using a numerical assessment system that has been adopted by Savannah Environmental for the overall EIA assessment.

Inclusion of Potential Lighting Impacts at night

This will be assessed through comparison of the likely change in night time lighting patters due to the proposed development.

Description of Alternatives, Mitigation Measures and Monitoring Programme

This will be compiled from experience of similar projects and through discussion with the applicant.

Complete 3D Modelling and Simulations With and Without Mitigation

Key development elements will be modelled using CAD. Views of the model will be superimposed onto photographs from key viewpoints.

Modelling will be undertaken in sufficient detail to illustrate the location and visual mass of development rather than detailed finishes.

REFERENCES

Guidelines for involving visual and aesthetic specialists in EIA processes, Author; Bernard Oberhozer. Published by the Provincial Government of the Western Cape: Department of Environmental Affairs and Development Planning, 2005

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Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM Administered Lands *United States Department of the Interior, Bureau of Land Management*, 2013.

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APPENDIX I

ASSESSOR'S CURRICULUM VITAE

Name	JONATHAN MARSHALL
Nationality	British
Year of Birth	1956
Specialisation	Landscape Architecture / Landscape & Visual Impact Assessment / Environmental Planning / Environmental Impact Assessment.
Qualifications	
Education	Diploma in Landscape Architecture, Gloucestershire College of Art and Design, UK (1979) Environmental Law, University of KZN (1997)
Professional	Registered Professional Landscape Architect (SACLAP) Chartered Member of the Landscape Institute (UK) Member of the International Association of Impact Assessment, South Africa
Languages	English - Speaking - Excellent - Reading - Excellent - Writing - Excellent
Contact Details	Post: 13 Askew Grove Glenwood Durban 4001 Cell: +27 83 7032995

General

Jon qualified as a Landscape Architect (Dip LA) at Cheltenham (UK) in 1979. He has been a chartered member of the Landscape Institute UK since 1986. He is also a Registered Landscape Architect and has had extensive experience in Environmental Assessment within South Africa.

During the early part of his career (1981 - 1990) He worked with Clouston (now RPS) in Hong Kong and Australia. During this period he was called on to undertake visual impact assessment (VIA) input to numerous environmental assessment processes for major infrastructure projects. This work was generally based on photography with line drawing superimposed to illustrate the extent of development visible.

He has worked in the United Kingdom (1990 - 1995) for major supermarket chains including Sainsbury's and prepared CAD based visual impact assessments for public enquiries for new store development. He also prepared the VIA input to the environmental statement for the Cardiff Bay Barrage for consideration by the UK Parliament in the passing of the Barrage Act (1993).

His more recent VIA work (1995 to present) includes a combination of CAD and GIS based work for a new international airport to the north of Durban, new heavy industrial operations, overhead electrical transmission lines, mining operations in West Africa and numerous commercial and residential developments.

VIA work undertaken during the last twelve months includes wind energy projects, and numerous solar plant projects.

Select List of Visual Impact Assessment Projects

- **Geelkop Solar PV projects –** Landscape and Visual Impact Assessment for seven proposed solar PV projects near Upington in the Northern Cape Province for Atlantic Renewable Energy Partners.
- **Makapanstad Agri- Hub –** Landscape and Visual Impact Assessment for proposed Agri-Hub development at Makapanstad in the North West Province for the Department of Rural Development and Land Reform.
- **Madikwe Sky Bubble -** Landscape and Visual Impact Assessment for proposed development of up-market accommodation at the Molori concession within the Madikwe Game Reserve.
- **Hartebeest Wind Energy Facility** – Landscape and Visual Impact Assessment Addendum Report for the proposed upgrading of turbine specifications for an authorised WEF near Mo0rreesburg in the Western Cape Province for a private client.
- **Selati Railway Bridge** - Landscape and Visual Impact Assessment for proposed development of up-market accommodation on a railway bridge at Skukuza in the Kruger Park.
- **Kangala Mine Extension -** Landscape and Visual Impact Assessment for a proposed extension to the Kangala Mine in Mpumalanga for Universal Coal.
- **Khunab Solar Developments** – Landscape and Visual Impact Assessment for four proposed solar PV projects near Upington in the Northern Cape Province for a private client.
- **Sirius Solar Developments** – Landscape and Visual Impact Assessment for four proposed solar PV projects near Upington in the Northern Cape Province for Sola Future Energy.
- **Aggeneys Solar Developments** – Landscape and Visual Impact Assessment for two proposed solar PV projects near Aggeneys in the Northern Cape Province for a private client.
- **Hyperion Solar Developments** – Landscape and Visual Impact Assessment for four proposed solar PV projects near Kathu in the Northern Cape Province for Building Energy South Africa.
- **Eskom Combined Cycle Power Plant** - Landscape and Visual Impact Assessment for proposed gas power plant in Richards Bay, KwaZulu Natal Province.
- **N2 Wild Coast Toll Road, Mineral Sources and Auxiliary Roads –** VIA for the Pondoland Section of this project for the South African National Roads Agency.
- **Mpushini Park Ashburton –** VIA for a proposed amendment to an authorised development plan which included residential, office park and light industrial uses to logistics and warehousing.
- **Moedeng PV Solar Project -** VIA for a solar project near Vrybury in the North West Province for a private client.
- **Establishment of Upmarket Tourism Accommodation on the Selati Bridge, Kruger National Park** – Assessment of visual implications of providing tourism accommodation in 12 railway carriages on an existing railway bridge at the Skukuza Rest Camp in the Kruger Park.
- **Jozini TX Transmission Tower** – Assessment of visual implications of a proposed MTN transmission tower on the Lebombo ridgeline overlooking the Pongolapoort Nature reserve and dam.
- **Bhangazi Lake Development** – Visual Impact Assessment for a proposed tourism development within the iSimangaliso Wetlend Park World Heritage Site.
- **Palesa Power Station** - VIA for a new 600MW power station near Kwamhlanga in Mpumalanga for a private client.
- **Heuningklip PV Solar Project** – VIA for a solar project in the Western Cape Province for a private client.
- **Kruispad PV Solar Project** – VIA for a solar project in the Western Cape Province for a private client.
- **Doornfontein PV Solar Project** – VIA for a solar project in the Western Cape Province for a private client.
- **Olifantshoek Power Line and Substation** – VIA for a new 10MVA 132/11kV substation and 31km

powerline, Northern Cape Province, for Eskom.

- **Noupoort Concentrating Solar Plants -** Scoping and Visual Impact Assessments for two proposed parabolic trough projects.
- **Drakensberg Cable Car –** Preliminary Visual Impact Assessment and draft terms of reference as part of the feasibility study.
- **Paulputs Concentrating Solar Plant (tower technology)** – Visual Impact Assessment for a new CSP project near Pofadder in the Northern Cape.
- **Ilanga Concentrating Solar Plants 1, 2, 3, 4 & 5** – Scoping and Visual Impact Assessments for the proposed extension of five authorised CSP projects including parabolic trough and tower technology within the Karoshoek Solar Valley near Upington in the Northern Cape.
- **Ilanga Concentrating Solar Plants 1, 2, 3, 4 & 5 Shared Infrastructure** –Visual Impact Assessment for the necessary shared infrastructure including power lines, substation, water pipeline and roads for these projects.
- **Ilanga Concentrating Solar Plants 7, 8 & 9** - Scoping and Visual Impact Assessments for three new CSP projects including parabolic trough and tower technology within the Karoshoek Solar Valley near Upington in the Northern Cape.
- **Sol Invictus Solar Plants** - Scoping and Visual Impact Assessments for three new Solar PV projects near Pofadder in the Northern Cape.
- **Gunstfontein Wind Energy Facility** – Scoping and Visual Impact Assessment for a proposed WEF near Sutherland in the Northern Cape.
- **Moorreeesburg Wind Energy Facility** – Visual Impact Assessment for a proposed WEF near Moorreeesburg in the Western Cape.
- **Semonkong Wind Energy Facility** - Visual Impact Assessment for a proposed WEF near Semonkong in Southern Lesotho.
- **Great Karoo Wind Energy Facility** – Addendum report to the Visual Impact Assessment Report for amendment to this authorised WEF that is located near Sutherland in the Northern Cape. Proposed amendments included layout as well as rotor diameter.
- **Perdekraal East Power Line** – Visual Impact Assessment for a proposed power line to evacuate power from a wind energy facility near Sutherland in the Northern Cape.
- **Tshivhaso Power Station** – Scoping and Visual Impact Assessment for a proposed new power station near Lephalale in Limpopo Province.
- **Saldanha Eskom Strengthening** – Scoping and Visual Impact Assessment for the upgrading of strategic Eskom infrastructure near Saldanha in the Western Cape.
- **Eskom Lethabo PV Installation** - Scoping and Visual Impact Assessment for the development of a solar PV plant within Eskom's Lethabo Power Station in the Free State.
- **Eskom Tuthuka PV Installation** - Scoping and Visual Impact Assessment for the development of a solar PV plant within Eskom's Thutuka Power Station in Mpumalanga.
- **Eskom Majuba PV Installation** - Scoping and Visual Impact Assessment for the development of a solar PV plant within Eskom's Majuba Power Station in Mpumalanga.
- **Golden Valley Power Line** - Visual Impact Assessment for a proposed power line to evacuate power from a wind energy facility near Cookhouse in the Eastern Cape.
- **Mpophomeni Shopping Centre** – Visual impact assessment for a proposed new shopping centre close to the southern shore of Midmar Dam in KwaZulu Natal.
- **Rheeboksfontein Power Line** - Addendum report to the Visual Impact Assessment Report for amendment to this authorised power line alignment located near Darling in the Western Cape.
- **Woodhouse Solar Plants** – Scoping and Visual Impact Assessment for two proposed solar PV projects near Vryburg in the North West Province.

- **AngloGold Ashanti, Dokyiwa (Ghana)** – Visual Impact Assessment for proposed new Tailings Storage Facility at a mine site working with SGS as part of their EIA team.
- **Gateway Shopping Centre Extension (Durban)** – Visual Impact Assessment for a proposed shopping centre extension in Umhlanga, Durban.
- **Kouroussa Gold Mine (Guinea)** – Visual impact assessment for a proposed new mine in Guinea working with SGS as part of their EIA team.
- **Mampon Gold Mine (Ghana)** - Visual impact assessment for a proposed new mine in Ghana working with SGS as part of their EIA team.
- **Telkom Towers** – Visual impact assessments for numerous Telkom masts in KwaZulu Natal.
- **Eskom Isundu Substation** – Visual Impact Assessment for a proposed major new Eskom substation near Pietermaritzburg in KwaZulu Natal.
- **Eskom St Faiths Power Line and Substation** – Visual Impact Assessment for a major new substation and associated power lines near Port Shepstone in KwaZulu Natal.
- **Eskom Ficksburg Power Line** – Visual Impact Assessment for a proposed new power line between Ficksburg and Cocolan in the Free State.
- **Eskom Matubatuba to St Lucia Power Line** – Visual Impact Assessment for a proposed new power line between Mtubatuba and St Lucia in KwaZulu Natal.
- **Dube Trade Port, Durban International Airport** – Visual Impact Assessment
- **Sibaya Precinct Plan** – Visual Impact Assessment as part of Environmental Impact Assessment for a major new development area to the north of Durban.
- **Umdloti Housing** – Visual Impact Assessment as part of Environmental Impact Assessment for a residential development beside the Umdloti Lagoon to the north of Durban.
- **Tata Steel Ferrochrome Smelter** - Visual impact assessment of proposed new Ferrochrome Smelter in Richards Bay as part of EIA undertaken by the CSIR.
- **Durban Solid Waste Large Landfill Sites –** Visual Impact Assessment of proposed development sites to the North and South of the Durban Metropolitan Area. The project utilised 3d computer visualisation techniques.
- **Hillside Aluminium Smelter, Richards Bay -** Visual Impact Assessment of proposed extension of the existing smelter. The project utilised 3d computer visualisation techniques.
- **Estuaries of KwaZulu Natal Phase 1 –** Visual character assessment and GIS mapping as part of a review of the condition and development capacity of eight estuary landscapes for the Town and Regional Planning Commission. The project was extended to include all estuaries in KwaZulu Natal.
- **Signage Assessments** – Numerous impact assessments for proposed signage developments for Blast Media.
- **Signage Strategy** – Preparation of an environmental strategy report for a national advertising campaign on National Roads for Visual Image Placements.
- **Zeekoegatt, Durban** - Computer aided visual impact assessment. EDP acted as advisor to the Province of KwaZulu Natal in an appeal brought about by a developer to extend a light industrial development within a 60 metre building line from the National N3 Highway.
- **La Lucia Mall Extension** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed extension to shopping mall for public consultation exercise.
- **Redhill Industrial Development** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed new industrial area for public consultation exercise.
- **Avondale Reservoir** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed hilltop reservoir as part of Environmental

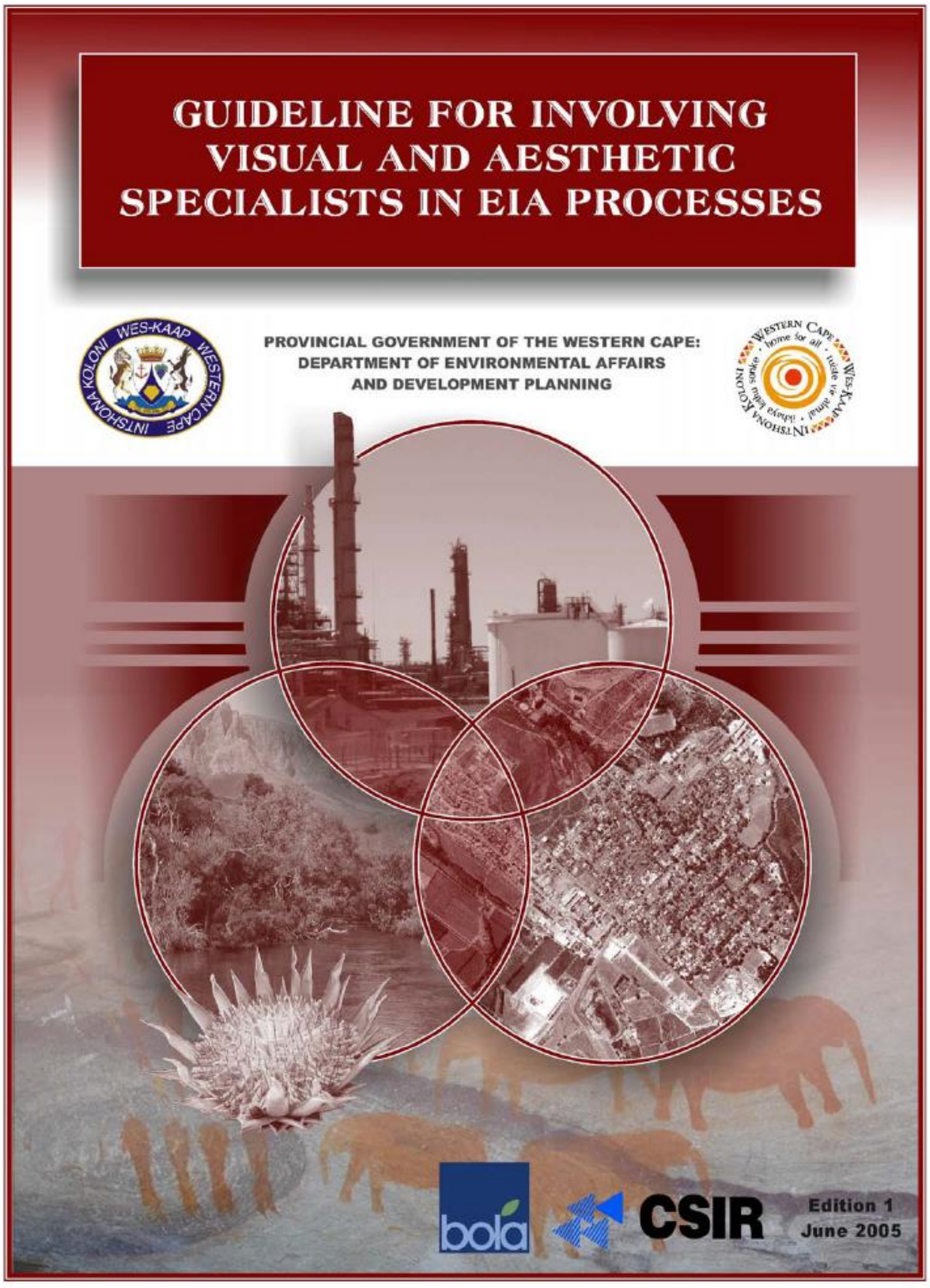
Impact Assessment for Umgeni Water.

- **Hammersdale Reservoir** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed hilltop reservoir as part of Environmental Impact Assessment for Umgeni Water.
- **Southgate Industrial Park, Durban** - Computer Aided Visual Impact Assessment and Landscape Design for AECI.
- **Sainsbury's Bryn Rhos** - Computer Aided Visual Impact Assessment/ Planning Application for the development of a new store within the Green Wedge North of Swansea.
- **Ynyston Farm Access** - Computer Aided Impact Assessment of visual intrusion of access road to proposed development of Cardiff for the Land Authority for Wales.
- **Cardiff Bay Barrage** – Preparation of the Visual Impact Statement for inclusion in the Impact Statement for debate by parliament (UK) prior to the passing of the Cardiff Bay Barrage Bill.
- **A470, Cefn Coed to Pentrebach** - Preparation of landscape frameworks for the assessment of the impact of the proposed alignment on the landscape for The Welsh Office.
- **Sparkford to Illchester Bye Pass** - The preparation of the landscape framework and the draft landscape plan for the Department of Transport.
- **Green Island Reclamation Study** - Visual Impact Assessment of building massing, Urban Design Guidelines and Masterplanning for a New Town extension to Hong Kong Island.
- **Route 3** - Visual Impact Assessment for alternative road alignments between Hong Kong Island and the Chinese Border.
- **China Border Link** - Visual Impact Assessment and initial Landscape Design for a new border crossing at Lok Ma Chau.
- **Route 81, Aberdeen Tunnel to Stanley** - Visual Impact Assessment for alternative highway alignments on the South side of Hong Kong Island.

APPENDIX II

GUIDELINES FOR INVOLVING VISUAL AND AESTHETIC SPECIALISTS IN EIA PROCESSES

(Preface, Summary and Contents for full document go to the Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning web site, http://eadp.westerncape.gov.za/your-resource-library/policies-guidelines)


GUIDELINE FOR INVOLVING VISUAL AND AESTHETIC SPECIALISTS IN EIA PROCESSES
PROVINCIAL GOVERNMENT OF THE WESTERN CAPE:
DEPARTMENT OF ENVIRONMENTAL AFFAIRS
AND DEVELOPMENT PLANNING
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GUIDELINE FOR INVOLVING VISUAL AND AESTHETIC SPECIALISTS IN EIA PROCESSES

Edition 1

Issued by:

Provincial Government of the Western Cape
Department of Environmental Affairs and Development Planning
Utilitas Building, 1 Dorp Street
Private Bag X9086
Cape Town 8000
South Africa

Prepared by:

Bernard Oberholzer Landscape Architect
PO Box 26643
Hout Bay, 7872, South Africa
email: bola@wol.co.za

Coordinated by:

CSIR Environmentek
P O Box 320
Stellenbosch 7599
South Africa

Contact person:

Frauke Münster
Tel: +27 21 888-2538
(fmunster@csir.co.za)

This guideline should be cited as:

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Steering committee:

Paul Hardcastle	-	DEA&DP
Ayub Mohammed	-	DEA&DP
Susie Brownlie	-	de Villiers Brownlie Associates
Keith Wiseman	-	City of Cape Town
Mike Burns	-	CSIR Environmentek
Paul Lochner	-	CSIR Environmentek
Pete Ashton	-	CSIR Environmentek

Focus group participants:

Paul Hardcastle	-	DEA&DP
Washiela Anthony	-	DEA&DP
Danie Smit	-	DEAT
Eileen Weinronk	-	City of Cape Town
Menno Klapwijk	-	Cave Klapwijk and Associates
Graham Young	-	Landscape Consultant
Bernard Oberholzer	-	Bernard Oberholzer Landscape Architect (BOLA)
Nicolas Baumann	-	Baumann & Winter Heritage Consultants
Sarah Winter	-	Baumann & Winter Heritage Consultants
Tanya de Villiers	-	Chittenden Nicks deVilliers Africa
Frauke Münster	-	CSIR Environmentek

Internal review:

Mike Burns	-	CSIR Environmentek
Eileen Weinronk	-	City of Cape Town
Paul Hardcastle	-	DEA&DP
Washiela Anthony	-	DEA&DP

Stakeholders engaged in the guideline development process:

These guidelines were developed through a consultative process and have benefited from the inputs and comments provided by a wide range of individuals and organizations actively working to improve EIA practice. Thanks are due to all who took the time to engage in the guideline development process.

In particular, thanks are due to Jan Glazewski (University of Cape Town), Keith Wiseman (City of Cape Town), Paul Britton (SANPARKS), Graham Young (University of Pretoria), Lisa Parkes (Ninham Shand) and Paul Claassen (Environomics) for providing useful information and in-depth comments.

Finalisation of report figures and formatting:

Magdel van der Merwe and Elna Logie, DTP Solutions

PREFACE

The purpose of an Environmental Impact Assessment (EIA) is to provide decision-makers (be they government authorities, the project proponent or financial institutions) with adequate and appropriate information about the potential positive and negative impacts of a proposed development and associated management actions in order to make an informed decision whether or not to approve, proceed with or finance the development.

For EIA processes to retain their role and usefulness in supporting decision-making, the involvement of specialists in EIA needs to be improved in order to:

- Add greater value to project planning and design;
- Adequately evaluate reasonable alternatives;
- Accurately predict and assess potential project benefits and negative impacts;
- Provide practical recommendations for avoiding or adequately managing negative impacts and enhancing benefits;
- Supply enough relevant information at the most appropriate stage of the EIA process to address adequately the key issues and concerns, and effectively inform decision-making in support of sustainable development.

It is important to note that not all EIA processes require specialist input; broadly speaking, specialist involvement is needed when the environment could be significantly affected by the proposed activity, where that environment is valued by or important to society, and/or where there is insufficient information to determine whether or not unavoidable impacts would be significant.

The purpose of this series of guidelines is to improve the efficiency, effectiveness and quality of specialist involvement in EIA processes. The guidelines aim to improve the capacity of roleplayers to anticipate, request, plan, review and discuss specialist involvement in EIA processes. Specifically, they aim to improve the capacity of EIA practitioners to draft appropriate terms of reference for specialist input and assist all roleplayers in evaluating whether or not specialist input to the EIA process is appropriate for the type of development and environmental context. Furthermore, they aim to ensure that specialist inputs support the development of effective, practical Environmental Management Plans where projects are authorised to proceed (refer to *Guideline for Environmental Management Plans*).

The guidelines draw on best practice in EIA in general, and within specialist fields of expertise in particular, to address the following issues related to the timing, scope and quality of specialist input. The terms "specialist involvement" and "input" have been used in preference to "specialist assessment" and "studies" to indicate that the scope of specialists' contribution (if required) depends on the nature of the project, the environmental context and the amount of available information and does not always entail detailed studies or assessment of impacts.

The guidelines draw on best practice in EIA in general, and within specialist fields of expertise in particular, to address the following issues related to the timing, scope and quality of specialist input. The terms "specialist involvement" and "input" have been used in preference to "specialist

assessment" and "studies" to indicate that the scope of specialists' contribution depends on the nature of the project, the environmental context and the amount of available information.

	ISSUES
TIMING	▪ When should specialists be involved in the EIA process; i.e. at what stage in the EIA process should specialists be involved (if at all) and what triggers the need for their input?
SCOPE	▪ Which aspects must be addressed through specialist involvement; i.e. what is the purpose and scope of specialist involvement? ▪ What are appropriate approaches that specialists can employ? ▪ What qualifications, skills and experience are required?
QUALITY	▪ What triggers the review of specialist studies by different roleplayers? ▪ What are the review criteria against which specialist inputs can be evaluated to ensure that they meet minimum requirements, are reasonable, objective and professionally sound?

The following guidelines form part of this first series of guidelines for involving specialists in EIA processes:

- Guideline for determining the scope of specialist involvement in EIA processes
- Guideline for the review of specialist input in EIA processes
- Guideline for involving biodiversity specialists in EIA processes
- Guideline for involving hydrogeologists in EIA processes
- Guideline for involving visual and aesthetic specialists in EIA processes
- Guideline for involving heritage specialists in EIA processes
- Guideline for involving economists in EIA processes

The *Guideline for determining the scope of specialist involvement in EIA processes* and the *Guideline for the review of specialist input in EIA processes* provide generic guidance applicable to any specialist input to the EIA process and clarify the roles and responsibilities of the different roleplayers involved in the scoping and review of specialist input. It is recommended that these two guidelines are read first to introduce the generic concepts underpinning the guidelines which are focused on specific specialist disciplines.

Who is the target audience for these guidelines?

The guidelines are directed at authorities, EIA practitioners, specialists, proponents, financial institutions and other interested and affected parties involved in EIA processes. Although the guidelines have been developed with specific reference to the Western Cape province of South Africa, their core elements are more widely applicable.

What type of environmental assessment processes and developments are these guidelines applicable to?

The guidelines have been developed to support project-level EIA processes regardless of whether they are used during the early project planning phase to inform planning and design decisions (i.e. during pre-application planning) or as part of a legally defined EIA process to obtain statutory approval for a proposed project (i.e. during screening, scoping and/or impact assessment). Where specialist input may be required the guidelines promote early, focused and appropriate involvement of specialists in EIA processes in order to encourage proactive consideration of potentially significant impacts, so that negative impacts may be avoided or

effectively managed and benefits enhanced through due consideration of alternatives and changes to the project.

The guidelines aim to be applicable to a range of types and scales of development, as well as different biophysical, social, economic and governance contexts.

What will these guidelines not do?

In order to retain their relevance in the context of changing legislation, the guidelines promote the principles of EIA best practice without being tied to specific legislated national or provincial EIA terms and requirements. They therefore do not clarify the specific administrative, procedural or reporting requirements and timeframes for applications to obtain statutory approval. They should, therefore, be read in conjunction with the applicable legislation, regulations and procedural guidelines to ensure that mandatory requirements are met.

It is widely recognized that no amount of theoretical information on how best to plan and coordinate specialist inputs, or to provide or review specialist input, can replace the value of practical experience of coordinating, being responsible for and/or reviewing specialist inputs. Only such experience can develop sound judgment on such issues as the level of detail needed or expected from specialists to inform decision-makers adequately. For this reason, the guidelines should not be viewed as prescriptive and inflexible documents. Their intention is to provide best practice guidance to improve the quality of specialist input.

Furthermore, the guidelines do not intend to create experts out of non-specialists. Although the guidelines outline broad approaches that are available to the specialist discipline (e.g. field survey, desktop review, consultation, modeling), specific methods (e.g. the type of model or sampling technique to be used) cannot be prescribed. The guidelines should therefore not be used indiscriminately without due consideration of the particular context and circumstances within which an EIA is undertaken, as this influences both the approach and the methods available and used by specialists.

How are these guidelines structured?

The specialist guidelines have been structured to make them user-friendly. They are divided into six parts, as follows:

- **Part A**: Background;
- **Part B**: Triggers and key issues potentially requiring specialist input;
- **Part C**: Planning and coordination of specialist inputs (drawing up terms of reference);
- **Part D**: Providing specialist input;
- **Part E**: Review of specialist input; and
- **Part F**: References.

Part A provides grounding in the specialist subject matter for all users. It is expected that authorities and peer reviewers will make most use of Parts B and E; EIA practitioners and project proponents Parts B, C and E; specialists Part C and D; and other stakeholders Parts B, D and E. Part F gives useful sources of information for those who wish to explore the specialist topic.

SUMMARY

This guideline document, which deals with specialist visual input into the EIA process, is organised into a sequence of interleading sections. These follow a logical order covering the following:

- the background and context for specialist visual input;
- the triggers and issues that determine the need for visual input;
- the type of skills and scope of visual inputs required in the EIA process;
- the methodology, along with information and steps required for visual input;
- finally, the review or evaluation of the visual assessment process.

Part A is concerned with defining the visual and aesthetic component of the environment, and with principles and concepts relating to the visual assessment process. The importance of the process being logical, holistic, transparent and consistent is stressed in order for the input to be useful and credible.

The legal and planning context within which visual assessments take place indicate that there are already a number of laws and bylaws that protect visual and scenic resources. These resources within the Western Cape context have importance for the economy of the region, along with the proclaimed World Heritage Sites in the Province.

The role and timing of specialist visual inputs into the EIA process are outlined, with the emphasis being on timely, and on appropriate level of input, from the early planning stage of a project, through to detailed mitigation measures and management controls at the implementation stage.

Part B deals with typical factors that trigger the need for specialist visual input to a particular project. These factors typically relate to:

(a) the nature of the receiving environment, in particular its visual sensitivity or protection status;
(b) the nature of the project, in particular the scale or intensity of the project, which would result in change to the landscape or townscape.

The correlation between these two aspects are shown in a table, in order to determine the varying levels of visual impact that can be expected, i.e. from little or no impact, to very high visual impact potential.

Part C deals with the choice of an appropriate visual specialist, and the preparation of the terms of reference (TOR) for the visual input. Three types of visual assessment are put forward, each requiring different expertise, namely:

Type A: assessments involving large areas of natural or rural landscape;
Type B: assessments involving local areas of mainly built environment;
Type C: assessments involving smaller scale sites with buildings, or groups of buildings.

The scope of the visual input would in summary relate to the following:

- the issues raised during the scoping process;
- the time and space boundaries, i.e. the extent or zone of visual influence;

- the types of development alternatives that are to be considered;
- the variables and scenarios that could affect the visual assessment;
- the inclusion of direct, indirect and cumulative effects.

Approaches to the visual input relate to the level of potential impact and range from minimal specialist input, to a full visual impact assessment (VIA). A list of the typical components of a visual assessment is given, and the integration with other studies forming part of the EIA process is discussed.

Part D provides guidance for specialist visual input, and on the information required by specialists. Notes on predicting potential visual impacts are given, along with suggested criteria for describing and rating visual impacts. The assessment of the overall significance of impacts, as well as thresholds of significance are discussed.

Further aspects that need to be considered by visual specialists in EIA processes include:

- affected parties who stand to benefit or lose,
- risks and uncertainties related to the project,
- assumptions that have been made, and their justification,
- levels of confidence in providing the visual input or assessment,
- management actions that can be employed to avoid or mitigate adverse effects and enhance benefits, and
- the best practicable environental option from the perspective of the visual issues and impacts.

Finally, pointers for the effective communication of the findings are given.

Part E lists specific evaluation criteria for reviewing visual input by a specialist, where this becomes necessary. Further guidance on this is given in the document on *Guideline for the review of specialist input in EIA processes.*

CONTENTS

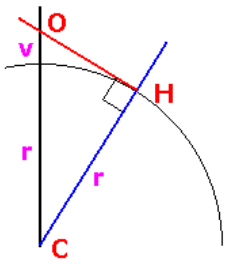
APPENDIX III

FORMULA FOR DERIVING THE APPROXIMATE VISUAL HORIZON

The Mathematics behind this Calculation

This calculation should be taken as a guide only as it assumes the earth is a perfect ball 6378137 metres radius. It also assumes the horizon you are looking at is at sea level. A triangle is formed with the centre of the earth (C) as one point, the horizon point (H) is a right angle and the observer (O) the third corner. Using Pythagoras's theorem we can calculate the distance from the observer to the horizon (OH) knowing CH is the earth's radius (r) and CO is the earth's radius (r) plus observer's height (v) above sea level.

Sitting in a hotel room 10m above sea level a boat on the horizon will be 11.3km away. The reverse is also true, whilst rowing across the Atlantic, the very top of a mountain range 400m high could be seen on your horizon at a distance of 71.4 km assuming the air was clear enough.



APPENDIX IV

SITE SENSITIVITY VERIFICATION
(IN TERMS OF PART A OF THE ASSESSMENT PROTOCOLS PUBLISHED IN GN 320 ON 20 MARCH 2020)

UJEKAMANZI WEF 1 PROJECT

SITE SENSITIVITY VERIFICATION (IN TERMS OF PART A OF THE ASSESSMENT PROTOCOLS PUBLISHED IN GN 320 ON 20 MARCH 2020

Part A of the Assessment Protocols published in GN 320 on 20 March 2020 (i.e. Site sensitivity verification is required where a specialist assessment is required but no specific assessment protocol has been prescribed) is applicable where the DEFF Screening Tool has the relevant themes to verify.

Accordingly, Specialists must please provide a site sensitivity verification report containing the information outlined below.

1 INTRODUCTION

In accordance with Appendix 6 of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) Environmental Impact Assessment (EIA) Regulations of 2014, a site sensitivity verification has been undertaken in order to confirm the current land use and environmental sensitivity of the proposed project area as identified by the National Web-Based Environmental Screening Tool (Screening Tool).

2 SITE SENSITIVITY VERIFICATION

the site sensitivity verification was undertaken using the following methodology:

- desk top analysis, using satellite imagery to identify the extent of the landscape that could be affected, key landscape character areas and potentially sensitive receptors;
- preliminary on-site inspection to verify the desk top analysis.

3 OUTCOME OF SITE SENSITIVITY VERIFICATION

Refer to Section 5 of the main report.

4 NATIONAL ENVIRONMENTAL SCREENING TOOL

The screening tool indicated that the “Landscape Wind Theme” could have a very high sensitivity. It did not provide detail of likely sensitivities.

The site verification process indicated the following landscape and receptor sensitivities:

SIGNIFICANCE	Landscape Character Areas (LCAs)	RECEPTORS
Low	Areas not recognised as having specific landscape value. **The Urban and the Industrial LCAs;**	Viewers' attention not focused on landscape. These include: **Residents of urban areas**
Medium	Landscape value is recognised locally, but is not protected; the	Viewers' attention may be focused on landscape. These include:

SIGNIFICANCE	Landscape Character Areas (LCAs)	RECEPTORS
	landscape is relatively intact, with a distinctive character; and the landscape is reasonably tolerant of change. These areas include: **The Rural LCA.**	**Homesteads; and** **Users of main and local roads.**
High	The qualities for which the landscape is valued are in a good condition, with a clearly apparent distinctive character. This distinctive character is susceptible to relatively small changes. **There are no character areas with a high significance.**	Viewer's attention very likely to be focused on landscape, e.g. people experiencing views from important landscape features of local physical, cultural or historic interest and beauty spots. Large number of viewers and/or location in a highly valued landscape could elevate viewer sensitivity to the highest level. These include: **Visitors to the protected areas; and** **Visitors to the Ons Pan Fishing Attraction.**

5 CONCLUSION

The landscape, site and receptor sensitivities were verified during the site visit and detailed in the body of the report.