

Proposed Impofu West Wind Farm
Eastern Cape Province

for

Red Cap Impofu West (Pty) Ltd

Visual Impact Assessment
Scoping Phase

February 2019



Prepared for
Aurecon South Africa (Pty) Ltd

Prepared by
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in association with
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NEMA requirements for Specialist Reports

	Specialist Report content as required by the NEMA 2014 EIA Regulations, as amended	Section
1 (1)(a)	(i) the specialist who prepared the report; and	Page 3
	(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;	
(b)	a declaration that the specialist is independent in a form as may be specified by the competent authority;	Page 4
(c)	an indication of the scope of, and the purpose for which, the report was prepared;	Section 1
(cA)	an indication of the quality and age of the base data used for the specialist report;	Section 3
(cB)	a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 13
(d)	the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 4
(e)	a description of the methodology adopted in preparing the report or carrying out the specialised process, inclusive of equipment and modelling used;	Section 2
(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;	Sections 11 and 12
(g)	an identification of any areas to be avoided, including buffers;	Section 9
(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;	Maps 6 and 7
(i)	a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 5
(j)	a description of the findings and potential implications of such findings on the impact of the proposed activity, or activities;	Section 15
(k)	any mitigation measures for inclusion in the EMPr;	Sections 12, 13, 14
(l)	any conditions for inclusion in the environmental authorisation;	Sections 14 and 15
(m)	any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 14
(n)	a reasoned opinion-	Sections 13, 14, 15
	(i) whether the proposed activity or portions thereof should be authorised; and	
	(iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity 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;	Refer to EAP
(p)	a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to EAP
(q)	any other information requested by the competent authority.	N/A
2	Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	N/A

Visual Specialists

The amendment to the Visual Impact Assessment (VIA) was prepared by the following:

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Expertise

Bernard Oberholzer has a Bachelor of Architecture (UCT) and Master of Landscape Architecture (U. of Pennsylvania), and has more than 20 years' experience in undertaking visual impact assessments. He has presented papers on *Visual and Aesthetic Assessment Techniques*, and is the author of *Guideline for Involving Visual and Aesthetic Specialists in EIA Processes*, prepared for the Dept. of Environmental Affairs and Development Planning, Provincial Government of the Western Cape, 2005.

Quinton Lawson has a Bachelor of Architecture Degree (Natal) and has more than 10 years' experience in visual assessments, specializing in 3D modeling and visual simulations. He has previously lectured on visual simulation techniques in the Master of Landscape Architecture Programme at UCT.

The authors have been involved in visual assessments for a wide range of residential, industrial and renewable energy projects. They prepared the 'Landscape Assessment' report for the *National Wind and Solar PV Strategic Environmental Assessment*, in association with the CSIR, for the Department of Environmental Affairs in 2014.



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

	(For official use only)
File Reference	12/12/20/ or 12/9/11/L
Number: NEAS	DEA/EIA
Reference Number:	

Application for integrated environmental authorisation and waste management licence in terms of the-

- (1) National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014; and
- (2) National Environmental Management Act: Waste Act, 2008 (Act No. 59 of 2008) and Government Notice 921, 2013.

PROJECT TITLE

Proposed Impofu West Wind Energy Farm, Eastern Cape: Visual Assessment
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4.2 The specialist appointed in terms of the Regulations_

We, Quinton Lawson and Bernard Oberholzer declare that --

General declaration:

We act as the independent specialists in this application;
We will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
We declare that there are no circumstances that may compromise our objectivity in performing such work;
We have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
We will comply with the Act, Regulations and all other applicable legislation;
We have no, and will not engage in, conflicting interests in the undertaking of the activity;
We undertake to disclose to the applicant and the competent authority all material information in our possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by us for submission to the competent authority;
all the particulars furnished by us in this form are true and correct; and
We realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



Signatures of the specialists:

Quinton Lawson, Architect and Bernard Oberholzer, Landscape Architect
Name of company (if applicable):

19 July 2018

Date:

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1 Purpose and Scope of the Study

The visual assessment of the proposed Impofu West Wind Farm forms part of three proposed wind farms being assessed near Oyster Bay in the Eastern Cape, along with a basic assessment for a proposed overhead powerline grid connection between the wind farm area and Port Elizabeth.

The Scope of the visual assessment includes three phases involving the following:

1. Screening / developmental sensitivity mapping, including desktop study and site visit to determine no-go and sensitive areas.
2. Updated visual sensitivity maps based on first pass technical wind farm layouts.
3. Full visual impact assessment of the three wind farms and a basic assessment of the grid connection, based on final layouts.

The first phase Visual Screening Assessment was carried out for all three of the proposed Impofu Wind Farms in October 2017. This included fieldwork to ground-truth the initial findings.

2 Visual Assessment Methodology

The methodology involves a number of standard procedures including those in the Guideline for Involving Visual and Aesthetic Specialists (Oberholzer, 2015):

- Quantify and assess the existing scenic resources/visual characteristics on and around the study area.
- Determine viewsheds, view corridors and important viewpoints in order to assess the visual influence of the proposed project.
- Determine visual issues, including those identified in the public participation process.
- Review the legal framework that may have implications for visual / scenic resources.
- Assess the significance of potential visual impacts resulting from the proposed project for the construction, operational and decommissioning phases of the project.
- Identify possible mitigation measures to reduce negative visual impacts for inclusion into the project design, including input into the Environmental Management Plan.
- Determine cumulative visual impacts of proposed wind farms in relation to existing and approved wind farm projects in the area.

3 Sources of Information

The main sources of information for the visual assessment included the following:

- Project description of the proposed wind farm provided by Red Cap and Aurecon (February 2018).
- 1:1 000 000 Geological map of South Africa, Council for Geoscience, 2011.
- 1:250 000 and 1:50 000 topographical maps of South Africa, Surveys and Mapping.
- Google Earth satellite imagery, 2018.
- SRTM DEM data.

Other sources of information are listed in the references.

4 Site Investigation

A visit to the Impofu project site (comprising the Impofu North, East and West Wind Farm areas) and surroundings, including a photographic survey, was carried out on 27 and 28 September 2017. The route taken on the field trip is indicated on Map 2. The season was not a consideration, nor has any major effect for carrying out a visual assessment.

5 Assumptions and Uncertainties

The actual turbine model has not been finalised, but a range of sizes has been provided by the Developer, and the worst case was used in this visual assessment of the turbine envelope (120m hub height and 150m rotor diameter).

Some assumptions had to be made regarding the footprint and height of the proposed substation and operation and management buildings (O&M buildings), as well as lighting and fencing relating to the proposed project, as architectural details of these will only become available at a later stage.

6 Regulatory Framework

The National Environmental Management Act (NEMA) and the Regulations in terms of Chapter 5 of NEMA (Act No. 107 of 1998), and NEMA EIA Regulations (2014), as amended, apply as the proposed wind farm is a listed activity requiring a scoping study and EIA. The need for a visual assessment has been identified.

The National Heritage Resources Act (NHRA) (Act No. 25 of 1999), provide legislative protection for natural, cultural and scenic resources. This report deals with visual considerations, while archaeological, paleontological and historical sites are covered by the heritage specialists.

7 Description of the Project

The Impofu West Wind Farm has been designed to have 29 turbines, according to the latest design layout. A total of 95 wind turbine locations have been identified across the consolidated Impofu Wind Farms site. The actual turbine model has not been finalised, but it is assumed to be about 3 to 6 MW.

The supporting infrastructure within the site includes internal gravel roads of approximately 6 m wide, underground and overhead medium voltage (MV) power lines (33 kV or lower) and a substation (Impofu West substation), as well as control, operation, workshop and storage buildings.

The upgrading of two river crossings on District Road 1774 to the west of Impofu West (outside of the Impofu West Wind Farm boundary) may be undertaken as part of the proposed project.

The connecting power line between the site and Port Elizabeth is the subject of a separate Basic Assessment Report (BAR). This separate application also includes the Impofu West switching station (immediately adjacent to the Impofu West substation), the Impofu Collector switching station, and the 132 kV collector lines between these switching stations.

A full list of proposed facilities is given in Table 1 below. See also Figures 1 and 2 for a visual indication of the proposed wind turbines (at a range of distances) and of the proposed substation / switching station.

Table 1: Description of Proposed Wind Energy Facilities

Facility	Extent/Footprint	Height	Comments
WEF area	26,4 sq.km	n/a	
No. of wind turbines:	29 turbines. Turbine capacity to be confirmed.	Hub ht. 90-120m Rotor diam. Max. 150m	Colour: off-white / grey – as specified by CAA
Turbine pads	100 x 50m crane pad and laydown area per turbine	n/a	Foundation 20 to 25m diameter.
Permanent hardstand for maintenance	50 x 30m per turbine	n/a n/a	
Internal access roads	±24 km internal roads linking turbine locations.	n/a	6m width, and wider in places to accommodate abnormal trucks.
Electrical substation	150 x 75m	Single storey building	To be combined with an Eskom switching station.
Operations and maintenance structures	Workshop/office buildings, maintenance and storage.	Single storey building	Located adjacent to substation.
Security fencing	Around substation and O&M building.	Max. 3m	Type unknown.
Security Lighting	To be confirmed.	To be confirmed.	At substation and O&M building.
Navigation lights	To be confirmed.	At hub height.	Flashing red light on selected turbines (to CAA requirements).
Construction Phase:			
Lay down area, construction camp	1,5 ha temporary site camp, laydown areas incl. access road, site offices.	Single storey structures	Temporary gravel hard standing and prefab structures.
On-site concrete batching plant	To be confirmed	n/a	Temporary plant.
Borrow pits	To be confirmed.	n/a	Possibly from existing sources.

Consideration of Alternatives:

According to Aurecon (March, 2018), no alternatives for the wind farm, other than the No-Go option, are being assessed in the Specialist Scoping and EIA Reports. The site and layouts considered and assessed in the specialist assessments are the preferred alternatives. Site alternatives were screened out of the project scope in the Screening Phase, and the layout further refined in the Scoping and EIA Stages.

Various conceptual layouts for the wind farm have been undertaken to date, but were not considered feasible from a technical or environmental perspective. The latest layout is the one that has been assessed in this report and it appears to be a feasible alternative that minimises the predicted negative impacts, as far as possible.

8 Description of the Study Area

A description of the landscape and scenic features, as well as potential receptors of the study area, are indicated in Table 2 below, and on Maps 1, 2 and 3.

Table 2: Characteristics of the Study Area

Landscape setting	The Impofu West site is located in the Eastern Cape, about 18 km west of Humansdorp, on a broad flat coastal plain. The site lies south of the N2 National Road and R102 Main Road. The area, known for its dairy farming, is flanked on the north-western boundary by the Tsitsikamma Community Wind Farm and Gibson Bay Wind Farm on the south-west and south-east boundary (See MetroGIS, 2011). The Kouga and Jeffreys Bay Wind Farms lie further to the west. The proposed Impofu North and Impofu East Wind Farms would border the site (see Map 1).
Geology and landforms	<p>The study area is a flat to gently undulating peneplain, underlain by quartzitic sandstones of the Cedarberg and Peninsula Formations of the Table Mountain Group of rocks, (Geological Survey, 2011). Additional geological and archaeological information is provided by Binneman (2017).</p> <p>The sandstone rocks are exposed along the coastline to the south. The southern part of the study area is covered with aeolian sand, which has formed hardened aeolianite in places, mainly the parallel dune ridges.</p> <p>The peneplain has been dissected by a number of rivers, including the <i>Kromrivier</i> to the north-east, forming a deep ravine. The upper reaches of the <i>Klipdrifrivier</i> runs through the middle of the site. Several dams have been constructed in these rivers, the largest being the Impofu Dam on the <i>Kromrivier</i> to the northeast of the site.</p> <p>The elevation ranges from sea level in the south to about 200m in the north (see Map 3).</p>
Vegetation cover and land use	<p>Most of the indigenous vegetation has been replaced by pasture and fodder for the dairy farming in the area, although dense indigenous dune forest occurs along the coastline and in the dune slacks. Copses and avenues of exotic trees such as gums, pines and beefwoods, have historically been planted around the farmsteads. Infestations of black wattle have invaded large areas, mainly along the river courses.</p> <p>There are existing wind farms adjacent to the Impofu West Wind Farm along with a number of other wind farms in the wider surroundings (see Map 1).</p>
Scenic features and receptors	<p>The study area has a pleasing rural character with green pastures grazed by cattle and sheep, interspersed by crops and wooded ravines along the stream courses. There are numerous farmsteads, both on the site and in the immediate surroundings. The nearest settlements are Clarkson at 20km, Humansdorp about 18km, and Oyster Bay 10km away.</p> <p>There are a number of nature reserves and game farms in the general area, the Jumanji Game Farm being a distance of about 10km and Thaba Manzi Game Farm between 10 and 15km. The Huisklip Nature Reserve is about 3km to the west, on the coast. Other receptors would be the users of the N2 National Road and the R102 Main Road about 3.5km away. Existing and proposed wind farms within 30km are also indicated on the Local Context Map 1.</p>

9 Visual Constraints and Sensitivity Mapping

Criteria normally used for determining visual sensitivity, along with the reasoning for these, are listed in Table 3 below. The criteria are divided into inherent scenic resources of the study area, and potential sensitive receptors.

An attempt has been made to quantify and spatialize the various criteria by means of buffers, based on guidelines prepared in the past for wind energy farms in general, along with

preliminary recommendations for the proposed Impofu West site, as indicated in Table 4. The buffers could vary depending on viewshed mapping and actual site conditions, such as the proximity of existing wind turbines. The actual height of the proposed wind turbines needs to be taken into account.

Scenic resources and sensitive receptors within the study area have been categorised into no-go, highly sensitive, moderately sensitive and low visual sensitivity areas, as indicated in Table 5. The existing wind turbines are taken into account in determining these categories. The visual constraints for the wind farm are indicated on Map 6, and the visual sensitivity levels on Map 7.

The visual sensitivity mapping helped to guide the testing of various scenarios for the layout of wind turbines during the screening phase, the current proposed layout largely avoiding visually sensitive areas, (see Map 7).

Table 3: Criteria for Determining Visual Sensitivity

Scenic Resources	Contributing Factors
Topographic features	Landscape features in the area contribute to scenic and natural heritage value. These include features that provide visual interest or contrast in the landscape such as ridges, steep slopes and geological features. Intact wilderness or rural landscapes tend to have higher scenic value and more sensitivity to development.
Water features	Water bodies, such as rivers and dams, generally have aesthetic, scenic, recreational and amenity value. Coastal shorelines, particularly promontories, tend to be visually sensitive. Sensitivity generally relates to their national, regional or local significance.
Cultural landscapes	Cultural landscapes, often along fertile river valleys, tend to have rural scenic value and historical or cultural significance. These are covered in more detail in the Heritage Assessment.
Sensitive Receptors	(includes residents, commuters, visitors and tourists)
Protected areas	These include nature reserves, which have wilderness and scenic attributes in addition to their biological conservation role, serving as important visitor / tourist destinations. Visual significance is increased by their protection status.
Game reserves / resorts	Private nature reserves, game farms, recreation resorts and tourist accommodation are important for the local economy, and tend to be sensitive to loss or degradation of scenic quality.
Human settlements	Towns, villages and farmsteads, particularly residential and resort areas, tend to be sensitive to visual intrusions, including an effect on property values and tourism. It was assumed that farmsteads within the development site would not be visually sensitive.
Scenic routes and arterial roads	Scenic and arterial routes tend to have historical, recreational and tourism importance, and are therefore visually sensitive. The N2 and R102 are the major arterial routes in the study area.
Heritage sites	These form part of the heritage study, but could have visual implications.

Table 4: Visual Buffers for Wind Turbines from Previous Studies

Landscape features/criteria	PGWC Guidelines (2006) ¹	Visual Guidelines (2014) ²	Impofu West Site recommended guideline
Project area boundary	-	-	Buffer is the height of the proposed turbines.
Prominent topographic features	500m	500m	Dune ridgelines.
Steep slopes	>1:4	>1:4 and >1:10	Avoid slopes >1:10
Coastal zone (scenic value)	3 to 4 km	1 to 2 km (sensitive)	1 km relates to National Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008) (ICM Act) regulations.
Perennial rivers, large dams, wetland features	500m	Perennial rivers: 250 - 500m.	Buffers subject to specialist freshwater assessment.
Minor streams/ tributaries. (Green corridors have visual landscape value).	-	-	Min. 50m. subject to freshwater assessment.
National Roads	3 km (can be reduced)	1 to 3 km	500m - 1km buffer for N2 recommended taking into account existing wind turbines.
Provincial / arterial roads	500m	1 km	Could be less given existing wind turbines nearby, e.g. R102 Route.
Scenic routes and passes	2.5 km	1 to 3 km	The R102 forms part of the Kouga Heritage Route. A section along the Kromrivier ravine is scenic.
Nature reserves / protected areas	2 km	3 to 5 km (subject to viewshed mapping)	Huisklip Nature Reserve is partly in a view shadow. Existing wind turbines need to be taken into account.
Private nature reserves/ game farms/ guest farms/ resorts (tourism value)	500m	2 to 5 km (subject to viewshed mapping)	Existing wind turbines in the same viewshed need to be taken into account.
Farmsteads	400m (noise)	500m	500m if outside the site. General literature recommends 500m to 2km.
Towns / settlements	800m	2 to 4 km	Existing wind turbines need to be taken into account.
Cultural landscapes / heritage sites	500m	500m (subject to viewshed mapping).	Refer to heritage study.

¹ Provincial Government of the Western Cape, 2006. Recommended Criteria Thresholds for Regional and Site Level Assessment.

² Lawson, Q. and Oberholzer, B. 2014. SEA for Wind and Solar Photovoltaic Energy in SA: Landscape Scoping Assessment Report.

Table 5: Visual Sensitivity Mapping Categories for the Impofu Wind Farms

Scenic Resources	No-go areas	High visual sensitivity	Moderate visual sensitivity	Low visual sensitivity
Topographic features	Landscapes of national scenic value. Slopes >1:5	Landscapes of regional scenic value. Slopes 1:5 to 1:10	Landscapes of local scenic value	-
Water features	Features of national scenic value	Features of regional scenic value	Features of local scenic value	-
Coastal zone	1 km coastal zone	2 km coastal zone	4 km coastal zone	-
Cultural landscapes ¹	Cultural landscapes of national significance	Cultural landscapes of regional significance	Cultural landscapes local significance	-
Protected Landscapes / Sensitive Receptors				
National Parks / RAMSAR sites	n/a	n/a	n/a	n/a
Nature Reserves / Biosphere Reserve.	within 2 km ^{2,3}	within 3 km ^{2,3}	within 5 km	-
Private reserves / game farms	within 1 km ²	within 2 km ²	within 4 km	-
Settlements / towns	within 1 km ²	within 2 km ²	within 4 km	-
Farmsteads / residences	within 500m ²	within 1 km	within 2 km	-
Scenic routes	within 1 km ²	within 2 km	within 4 km	-
National route N2	within 500m ²	within 1 km	within 2 km	-
Arterial route R102	-	within 250m ²	within 500m	-

¹ Cultural landscapes and features to be determined by heritage specialist.

² Buffers could be less if receptors are in a view shadow or near existing turbines.

³ Buffers could be less if the reserve has no tourism facilities.

10 Key Visual Issues

The potential visual issues identified by the specialists during the scoping phase of this EIA process include the following:

- Potential scarring in the landscape caused by earthworks for access roads and assembly platforms, particularly on the steeper slopes;
- Dust and noise during construction from heavy machinery, truck traffic and cranes.
- Potential visual effect of wind turbines on the rural / cultural landscape and on surrounding farmsteads / settlements;
- Potential shadow flicker caused by wind turbines to nearby receptors in the early morning and late afternoon (see separate shadow flicker report).
- Potential visual clutter of on-site substation, operations and maintenance structures (O&M structures) and connecting powerlines; and
- Potential visual intrusion caused by navigation lighting from turbines and security lighting at substations and O&M structures.

No additional issues have arisen during the public participation process thus far.

11 Visual Assessment Criteria

The visual assessment of the proposed wind farm is based on a number of quantitative and qualitative criteria to determine potential visual impacts, as well as their relative significance, including the following considerations:

11.1 Visibility (Maps 1, 2 and 3)

Distance radii are indicated on Maps 2 and 4 to quantify visibility of the proposed wind farm. Degrees of visibility are listed below, but may be subject to foreground topography and the number of turbines that are visible (see also Figures 3 and 4 for viewpoint images).

High visibility:	Prominent feature within the observer's viewframe 0-2.5km
Mod-high visibility:	Relatively prominent within observer's viewframe 2.5-5km
Moderate visibility:	Only prominent with clear visibility as part of the wider landscape 5-10km
Marginal visibility:	Seen in very clear visibility as a minor element in the landscape 10-20km

A range of significant viewpoints were identified, together with their relative distances and anticipated visibility for the Impofu West Wind Farm in Table 6 below. Figures 3 and 4 indicate viewpoints that are closest to the proposed Wind Farm.

11.2 Visual Exposure (Maps 4 and 5)

Visual exposure of the proposed wind farm is determined by the viewshed indicated on Map 4, being the geographic area within which the project would be visible. The wind farm would be located on a visually exposed plain. The viewshed is partly cut off by the Kareedouwberg ridge, resulting in some areas to the north of the site being within a view shadow, and therefore not affected by the wind farm. A combined viewshed for all three of the proposed Impofu Wind Farms is indicated on Map 5 and this is relevant for consideration of cumulative impacts (Section 12).

11.3 Landscape Integrity

Visual quality tends to be enhanced by scenic or rural quality and intactness of the landscape, as well as absence of other visual intrusions. The study area has already been altered by the existing wind farms in the area (see Table 2), while still maintaining a rural farming character. The proposed wind farm would add to the overall effect of a renewable energy landscape.

11.4 Visual Sensitivity (Maps 6 and 7)

The Kromrivier ravine is a notable scenic feature, while the N2 National Route and R102 Main Road some 3km or more to the north are important visual corridors.

Cultural landscapes generally form part of a separate heritage study, but are important in that they may be visually sensitive. In the case of the Impofu site, the traditional farmed landscape, with its farmsteads, and the R102 old main road running parallel with the N2 would have some heritage and scenic significance.

11.5 Visual Absorption Capacity (VAC)

This is the potential of the landscape to screen the wind farm project from view. The site is generally flat, with some dune ridges in the southern portion. Tree belts and avenues occur in relation to farmsteads, but the area is otherwise visually exposed, i.e. has relatively low visual absorption capacity. As previously indicated, the viewshed area to the north of the N2 is partly screened by the Kareedouwberg ridgeline.

The overall visual impact intensity of the proposed wind farm development is assessed in Table 7 below, using the criteria described above.

Table 6: Distances and Visibility from Viewpoints (as indicated in Map 2)

View-point	Location	Coordinates		Distance to WEF ¹	Visibility
vp1	N2 R102 : Bridge to Clarkson	-34,05053	24,45572	7.74km	Moderately visible
vp2	District Road : Palmietvlei Farm Gate	-34,08615	24,45743	6.13km	Moderately visible
vp3	District Road : Dennegeur Farm	-34,09825	24,46848	4.62km	Mod. to highly visible
vp4	District Road : Sarnia Farm	-34,10789	24,47039	4.14km	Mod. to highly visible (See Figure 3)
vp5	District Road : Schoonfontein Farm	-34,08524	24,48503	3.97km	Farm located in a dip
vp6	District Road : Ville Fonte Farm Gate	-34,10139	24,50186	1.89km	Highly visible (See Figure 4)
vp7	Huisklip Nature Reserve Picnic Site	-34,13952	24,44391	6.43km	Not visible (mostly in a view shadow)
vp8	Huisklip Nature Reserve Access Road	-34,13998	24,46009	4.97km	Mod. to highly visible
vp9	District Road : Brandewynkop Farm	-34,11702	24,56097	2.48km	Highly visible (See Figure 4)
vp10	District Road : Brandkop Farm	-34,12004	24,56397	2.81km	Mod. to highly visible
vp11	Access Road : Duinevlei Farm	-34,13677	24,57313	4.61km	Mod. to highly visible
vp12	District Road : Sanddrif Farm	-34,12660	24,58032	3.53km	Mod. to highly visible
vp13	Oyster Bay Town (West) Perlemoen Ave.	-34,16753	24,65157	10.72km	Marginally visible
vp14	Grass Ridge Farm	-34,16458	24,65616	10.77km	Marginally visible
vp15	Access Road : Boontjieskraal Farm	-34,15433	24,67750	11.54km	Marginally visible
vp16	District Road : Welgelegen Farm	-34,15422	24,68791	12.34km	Marginally visible
vp17	District Road : Kleinplaas Farm School	-34,09822	24,65508	7.43km	Moderately visible
vp18	District Road : Kleinplaas Farm near intersection	-34,09192	24,66210	8.08km	Moderately visible
vp19	Oyster Bay Lodge Gate	-34,16070	24,63619	9.22km	Moderately visible
vp20	Vanrooyenshoek Farm Gate	-34,06730	24,65683	7.79km	Moderately visible
vp21	District Road : Plaatjiesdrift Farm	-34,03950	24,71941	14.22km	Marginally visible
vp22	R102 : Doringrug Farm Gate	-34,02765	24,70562	13.51km	Marginally visible
vp23	R102 : Stillerus Farm Gate	-34,02177	24,69575	12.98km	Marginally visible
vp24	Access Road : Leeubos Farm Cowshed	-34,03403	24,62770	6.99km	Moderately visible
vp25	N2 : Opposite Kromrivier Ravine	-34,04170	24,58272	3.64km	Mod. to highly visible
vp26	N2 : Opposite Kromrivier Ravine	-34,03600	24,57026	3.88km	Mod. to highly visible
vp27a	R102 : Suiderland Farm looking South	-34,04933	24,52992	2.09km	Highly visible
vp27b	R102 : Suiderland Farm looking North	-34,04914	24,52969	2.12km	Highly visible

¹ Colours indicate relative proximity of the wind turbines to viewpoints, red being the nearest and therefore the most visible, unless in a view shadow. Selected viewpoints in red have been depicted on photomontages in Figures 3 and 4.

Table 7: Visual Impact Intensity

Visual Criteria	Comments	Wind Turbines	Related Infrastructure
Visibility of facilities	Visible from a number of farmsteads, from the N2 and R102 routes, and part of the Huisclip Nature Reserve.	High	Low
Visibility of lights at night	Navigation lights on turbines, security lighting at substation and O&M buildings.	Medium	Medium
Visual exposure	Viewshed extends across the plain, partly restricted by landforms to the northwest.	High	Low
Landscape integrity	Rural dairy-farming character. Existing wind farms.	Medium	Medium
Landscape sensitivity	N2 and R102 routes, farmsteads and Huisclip Nature Reserve.	High	Low
Visual absorption capacity	Visually exposed plain. Coastline is partly obscured by dune topography.	High	Medium
Impact intensity	Summary	Medium to high	Low to medium

12 Visual Impact Assessment

12.1 Determination of Impact Significance

The assessment criteria for the evaluation of visual impacts for the proposed Impofu West Wind Farm are based on the methodology and numerical weighting provided by Aurecon (2018), as summarised in Tables 8 to 12, where the impacts are categorised as follows:

Potential Visual Impacts: Construction Phase

Potential visual intrusion, construction traffic, cranes, dust and noise, from the construction of both wind turbines and related infrastructure, affecting the rural sense of place.

Potential Visual Impacts: Operational Phase

Potential visual intrusion of proposed wind turbines and of related infrastructure such as substation and lights at night on the rural landscape, visible to surrounding receptors.

Potential Visual Impacts: Decommissioning Phase

Potential visual effect of remaining roads, platforms and concrete slabs on the landscape after decommissioning of the wind farm.

The quantification of the above visual impacts is based on the ratings described below:

Status (positive or negative type impact):

The status, or nature of the visual impact, is considered to be **negative**, given the height of the wind turbines and the scale of the proposed wind farm, in relation to the landscape character of the area.

Extent (spatial scale):

The zone of visual influence would not exceed about 20km, and the visual receptors would be restricted to Oyster Bay, local isolated farmsteads and users of the N2 and R102 to the north of the site. The assigned value would therefore be **municipal area (4)** for wind turbines and **local (3)** for related infrastructure.

Duration (temporal scale):

The predicted life-span of the proposed wind farm is expected to be more than 15 years, and therefore the assigned numerical value is **on-going (6)**. Construction phase would be **short-term (3)**.

Intensity (magnitude or degree of alteration):

Based on the potential visual impacts outlined in Section 11 above it is expected that the intensity of the impacts would be **medium to very high (6)** for the proposed wind farm, and **low- medium (4)** for related infrastructure. (See Table 7).

Consequence:

Consequence is calculated as a combination of intensity + extent + duration in conjunction with status. Consequence during the construction period would be lower because it is short term.

Probability (likelihood):

The likelihood of the potential wind farm visual impacts occurring is **certain (7)** without and with mitigation, given the scale of the proposed wind farm and the exposed nature of the terrain, with little or no opportunity for screening or mitigation.

Significance:

Significance is determined by combining consequence x probability, firstly without mitigation and then with mitigation measures in place. The level of significance is calculated automatically in the visual assessment tables below.

Confidence:

The confidence rating for the visual impact findings is **high** based on the field work, viewshed mapping (Map 4) and photomontages (Figures 3 and 4), as well as experience with similar visual effects of wind farms elsewhere.

Reversibility:

The potential visual impacts are reversible over the long term if the wind farm is decommissioned and the site rehabilitated, the assigned rating for reversibility of visual impacts on the affected environment therefore being **high**.

12.2 Visual assessment of the no-go alternative:

The No-Go alternative would result in the *status quo* being maintained, with landforms and the skyline remaining visually intact. Thus, there would be no additional visual intrusion on the rural landscape and on settlements in the area. The current farming character of the area would probably remain unchanged, although the overall rural character has already been transformed to some extent by the existing surrounding wind farms.

The potential visual impact would therefore be **neutral**. The project would no longer be financially viable and no further employment would be created.

12.3 Visual assessment of Cumulative impacts:

Scenario 1: All three Impofu Wind Farms

The development of the three proposed Impofu wind farms, seen together would result in cumulative visual impacts resulting in a change to the character of the area, particularly viewed from Oyster Bay and surrounding farmsteads. However, existing wind turbines are already visible from these areas.

Where wind farms are grouped together, as in the case of the study area, viewsheds would tend to overlap to some degree, particularly as the proposed Eastern Impofu Wind Farm can be seen as an infill wind farm (see Map 5 for combined viewshed) in relation to the surrounding existing wind farms. The cumulative visual impacts could therefore be of **moderate (-)** significance for the proposed wind turbines and related infrastructure, moderate-minor for lighting, and minor for decommissioning.

Scenario 2: *All three Impofu Wind Farms plus all future potential approved wind farms within 30km.*

The development of the three proposed Impofu wind farms, seen together with the existing and future approved potential wind farms in the vicinity, could result in cumulative visual impacts with a further change to the character to the area.

However, the fact that the area can be seen as a renewable energy node needs to be taken into consideration. The cumulative visual impacts could therefore be similar to those of scenario 1.

13 Visual Impact Mitigation

Where avoidance of visual impacts is not possible, for example in the layout of the project components, the next management action is to determine possible mitigation measures that can be used to minimize adverse effects of potential visual impacts, as outlined in this section.

Pre-construction Phase mitigation measures:

- Location of internal powerlines underground where possible.
- Existing roads /tracks used as far as possible, and new access /maintenance roads kept as narrow as possible.
- Location of substation and O&M buildings in unobtrusive, low-lying positions, away from main roads or district roads, and avoiding ridgelines or hillcrests. Alternatively, screened by earth berms and tree planting, as largely observed in the current layout.

Construction Phase mitigation measures:

- Locate the construction camp, batching plant and related storage/stockpile areas as far as possible in unobtrusive positions in the landscape, and where possible away from provincial roads, or alternatively screening measures to be utilized, as observed in the current layout.
- Clear demarcation of construction camps, limited in size to only that which is essential.
- Implementation of dust suppression and litter control measures.
- Construction activities to be restricted to normal working hours where possible, or alternatively conform with mitigations in the Noise Impact Assessment.
- Formulation and adherence to an Environmental Management Programme (EMPr), monitored by an Environmental Control Officer (ECO).

Operational Phase mitigation measures:

- Potential for visual mitigation of wind turbines is low. (Mitigation through avoidance and micro-siting has already been undertaken in the iterative design process).
- Substations and O&M buildings to be screened with earth berms and tree or hedge planting if close to main roads or district roads and highly visible from these roads.
- External signage to be kept to a minimum and billboard type signs avoided.
- Navigation lights to be kept to the minimum allowed by the CAA.
- Security and area lighting at substations and O&M buildings to be fitted with reflectors to minimize light spillage. Low-level bulkhead lights used in preference to lamp standards.

Decommissioning Phase mitigation measures:

- Wind turbines removed and building structures demolished or recycled for new uses.
- Hardened platform areas and access roads no longer required to be ripped and regraded.
- Exposed or disturbed areas revegetated or returned to grazing pasture or natural vegetation to blend with the surroundings.

Table 8: Construction Phase – Wind turbines and Related Infrastructure

Project phase	Construction			
Impact	Potential visual intrusion of construction activities on the rural landscape and scenic resources. Potential visual scarring of the landscape caused by earthworks for access roads.			
Description of impact	Noise and dust generated by construction cranes and trucks in the erection of wind turbines and building of access roads.			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	<p>Pre-construction Phase:</p> <p>1) Internal powerlines to be located underground where possible.</p> <p>2) Existing roads / tracks to be used as far as possible and new access / maintenance roads kept as narrow as possible.</p> <p>3) Substations to be located in unobtrusive positions, avoiding ridgelines or hillcrests, or alternatively screened by earth berms and tree planting, as largely implemented in the current layout.</p> <p>Construction phase:</p> <p>4) Construction camps and storage/stockpile areas to be located in unobtrusive positions in the landscape, away from main roads, farmsteads and scenic areas, or alternatively screening measures utilised, as implemented in the current layout.</p> <p>5) Construction camps to be clearly delineated and limited in size to only that which is essential.</p> <p>6) Implementation of dust suppression and litter control measures.</p> <p>7) Construction activities to be restricted to normal working hours where possible, or alternatively conform with mitigations in the Noise Impact Assessment.</p> <p>8) Adherence to an Environmental Management Programme (EMPr), monitored by an Environmental Control Officer (ECO).</p>			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Negative	
Duration	Short term	impact will last between 1 and 5 years	Short term	impact will last between 1 and 5 years
Extent	Local	Extending across the site and to nearby settlements	Local	Extending across the site and to nearby settlements
Intensity	High	Natural and/ or social functions and/ or processes are notably altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Moderate - negative		Minor - negative	
Comment on significance	Although minor significance with mitigation, there would be some residual visual impacts relating to noise and general disturbance caused by heavy trucks and construction activities, which remain after mitigation.			
Cumulative impacts	Moderate - negative for both scenarios.			

Table 9: Operation Phase – Wind turbines

Project phase	Operation			
Impact	Potential visual intrusion of proposed wind turbines on the rural landscape, settlements, scenic resources and overall sense of place. Affected areas are indicated on the visual sensitivity map (Map 7).			
Description of impact	Erection of wind turbines with associated assembly pads and roads.			
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts		
Potential mitigation	Little potential for visual screening of wind turbines.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Negative	
Duration	On-going	Impact will last between 15 and 20 years	On-going	Impact will last between 15 and 20 years
Extent	Municipal area	Impacts felt at a municipal level	Municipal area	Impacts felt at a municipal level
Intensity	High	Natural and/ or social functions and/ or processes are notably altered	High	Natural and/ or social functions and/ or processes are notably altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Moderate - negative		Moderate - negative	
Comment on significance	Probably moderate-major both before and after mitigation. (This category is not available in the automatic calculation). The lack of potential for visual mitigation at the operation phase means that residual impacts would remain moderate-major.			
Cumulative impacts	Moderate - negative for both scenarios. (The difference between scenarios would be too marginal to measure in visual terms).			

Table 10: Operation Phase – Related Infrastructure

Project phase	Operation			
Impact	Visual intrusion of related infrastructure on the rural farming landscape.			
Description of impact	Visual clutter of substation, O&M buildings, roads and power lines.			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	<p>1) Substation and O&M buildings to be screened with earth berms and tree or hedge planting, if close to main roads or district roads and highly visible from these roads.</p> <p>2) External signage kept to a minimum and billboard type signs avoided.</p>			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Negative	
Duration	On-going	Impact will last between 15 and 20 years	On-going	Impact will last between 15 and 20 years
Extent	Local	Extending across the site and to nearby settlements	Local	Extending across the site and to nearby settlements
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	Medium	Determination is based on common sense and general knowledge
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	Medium	The affected environment will only recover from the impact with significant intervention
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Moderate - negative		Minor - negative	
Comment on significance	Minor - negative significance after mitigation because visual impacts are localised and some visual screening can be used for mitigation. As the mitigations would only have a partial effect, some residual visual impacts relating to the visibility of substations and other electrical infrastructure would remain.			
Cumulative impacts	Moderate significance because of combined effect of substations with wind turbines and power lines.			

Table 11: Operation Phase – Lighting

Project phase	Operation			
Impact	Visual intrusion of lights at night on dark skies.			
Description of impact	Introduction of navigation lights on turbines, security and area lighting.			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	1) Navigation lights to be kept to the minimum allowed by the CAA. 2) Security and area lighting at substations and O&M buildings to be fitted with reflectors to minimize light spillage. 3) Low-level lights used in preference to lamp standards.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Negative	
Duration	On-going	Impact will last between 15 and 20 years	On-going	Impact will last between 15 and 20 years
Extent	Municipal area	Impacts felt at a municipal level	Municipal area	Impacts felt at a municipal level
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Moderate - negative		Moderate - negative	
Comment on significance	Moderate before mitigation, moderate-minor after mitigation, with some residual visual impacts relating to lights in the rural landscape remaining.			
Cumulative impacts	Moderate - negative			

Table 12: Decommissioning Phase – Wind turbines and Related Infrastructure

Project phase	Decommissioning			
Impact	Visual intrusion of remaining structures and access roads on the rural landscape.			
Description of impact	Visual effect of remaining platforms, structures, roads and concrete slabs.			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	1) Wind turbines removed and building structures demolished or recycled for new uses. 2) Hardened platform areas and access roads no longer required to be ripped and regraded. 3) Exposed or disturbed areas revegetated or returned to grazing pasture or natural vegetation to blend with the surroundings.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Negative	
Duration	Long term	Impact will last between 10 and 15 years	Short term	impact will last between 1 and 5 years
Extent	Local	Extending across the site and to nearby settlements	Limited	Limited to the site and its immediate surroundings
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Moderate - negative		Minor - negative	
Comment on significance	Minor significance after mitigation because disused structures and access roads could be removed and the site rehabilitated. Some residual visual impacts, such as access roads and concrete slabs would remain.			
Cumulative impacts	Minor significance assuming removal of above-ground infrastructure.			

14 Environmental Management Programme

Visual input into the Environmental Management Programme (EMPr) is discussed below. This should be included in the authorization for the project.

14.1 Construction Phase Monitoring:

Ensure that visual management measures are included as part of the EMPr, monitored by an Environmental Control Officer (ECO), including siting and management of the construction camp and stockpiles (as prescribed in the mitigation measures in Section 13), dust suppression and litter control measures, as well as rehabilitation of borrow pits and haul roads, with monthly reporting to an environmental management team.

Responsibility: Impofu West Wind Farm ECO / Contractor.

Timeframe: Preparation of EMPr during the planning phase. Monitoring during the contract phase.

14.2 Operation Phase Monitoring:

Ensure that visual mitigation measures are monitored by management on an on-going basis, including the maintenance of rehabilitated areas, control of signage, lighting and wastes on the site, with interim inspections by a delegated ECO.

Responsibility: Red Cap Management and Impofu West Wind Farm ECO.

Timeframe: During the operational life of the project.

14.3 Decommissioning Phase Monitoring:

Ensure that procedures for the removal of structures and stockpiles during decommissioning are implemented, including recycling of materials and rehabilitation of the site to a visually acceptable standard, and signed off by the delegated authority.

It is assumed that some access roads and concrete pads would remain. Those that are not required should be ripped and the vegetation or grazing cover reinstated.

The revegetation measures are not described here as they would fall under the auspices of the vegetation/biodiversity specialist.

Responsibility: Impofu West Wind Farm ECO / Contractor / qualified rehabilitation ecologist or horticulturist.

Timeframe: During the decommissioning contract phase, as well as a prescribed maintenance period thereafter (usually one year).

15 Findings and Recommendations

The potential visual impact significance of the proposed Impofu West wind turbines could be **moderate (-)** without mitigation. The layout of the proposed wind turbines succeeds in avoiding practically all the visual constraints for this area, occupying the least sensitive parts of the site, with little or no potential for mitigation, and would therefore remain **moderate (-)** visual significance.

Based on the design process, no further mitigation of the wind farm layout is envisaged, as a number of iterations has resulted in the current preferred layout. This process has resulted in the present layout being proposed for assessment. A

The proposed Wind Farm would affect the rural quality, or sense of place, of the area as a result of potential cumulative visual impacts. On the other hand, the proposed Wind Farm

would have a relatively minor visual influence on settlements and protected areas, such as nature reserves, in the general area, distance being a mitigating factor.

When assessed together with the Impofu North and Impofu East Wind Farms, as well as the surrounding approved wind farms, the proposed Impofu West Wind Farm would increase the cumulative visual impact on the baseline landscape context, but at the same time become part of a renewable energy node in what is already a wind energy landscape. The potential cumulative visual impact significance would therefore be **moderate (-)**.

The fact that the proposed Impofu West Wind Farm could potentially be dismantled during the decommissioning phase in the medium to long term, and the site restored to more or less its original state, is a positive consideration.

The potential visual impact significance of related infrastructure, such as the substation and O&M buildings would be **moderate (-)** before mitigation and **minor (-)** after mitigation. The significance of lighting would similarly be **moderate (-)** before mitigation and **moderate-minor (-)** significance after mitigation.

The height of the wind turbines could possibly be taller in some cases than the existing wind turbines of adjacent wind farms. This generally tends to have only a marginal effect on the viewshed and overall change in character to the area.

It is the opinion of the Visual Specialists that the preferred Impofu West Wind Farm layout does not present a potential fatal flaw in visual terms, given the changes undertaken to date in the iterative process resulting in the current preferred layout.

References

Aurecon, 2018. Specialist Terms of Reference for Scoping and Environmental Impact Assessment.

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Lawson, Q. and Oberholzer, B. 2014. National Wind and Solar PV Strategic Environmental Assessment Specialist Report: Landscape Assessment. Prepared with CSIR for Department of Environmental Affairs.

MetroGIS, August 2011. Proposed Tsitsikamma Community Wind Energy Facility, North of Oyster Bay, Eastern Cape: Visual Impact Assessment.

Oberholzer, B. 2005. Guideline for Involving Visual and Aesthetic Specialists in EIA Processes. Edition 1. Provincial Government of the Western Cape.

Diagram indicates visibility of WTG at increasing distances.

- Maximum proposed size of ;
- Hub Height 150m
 - Rotor Diameter 150m
 - Blade Length 75m

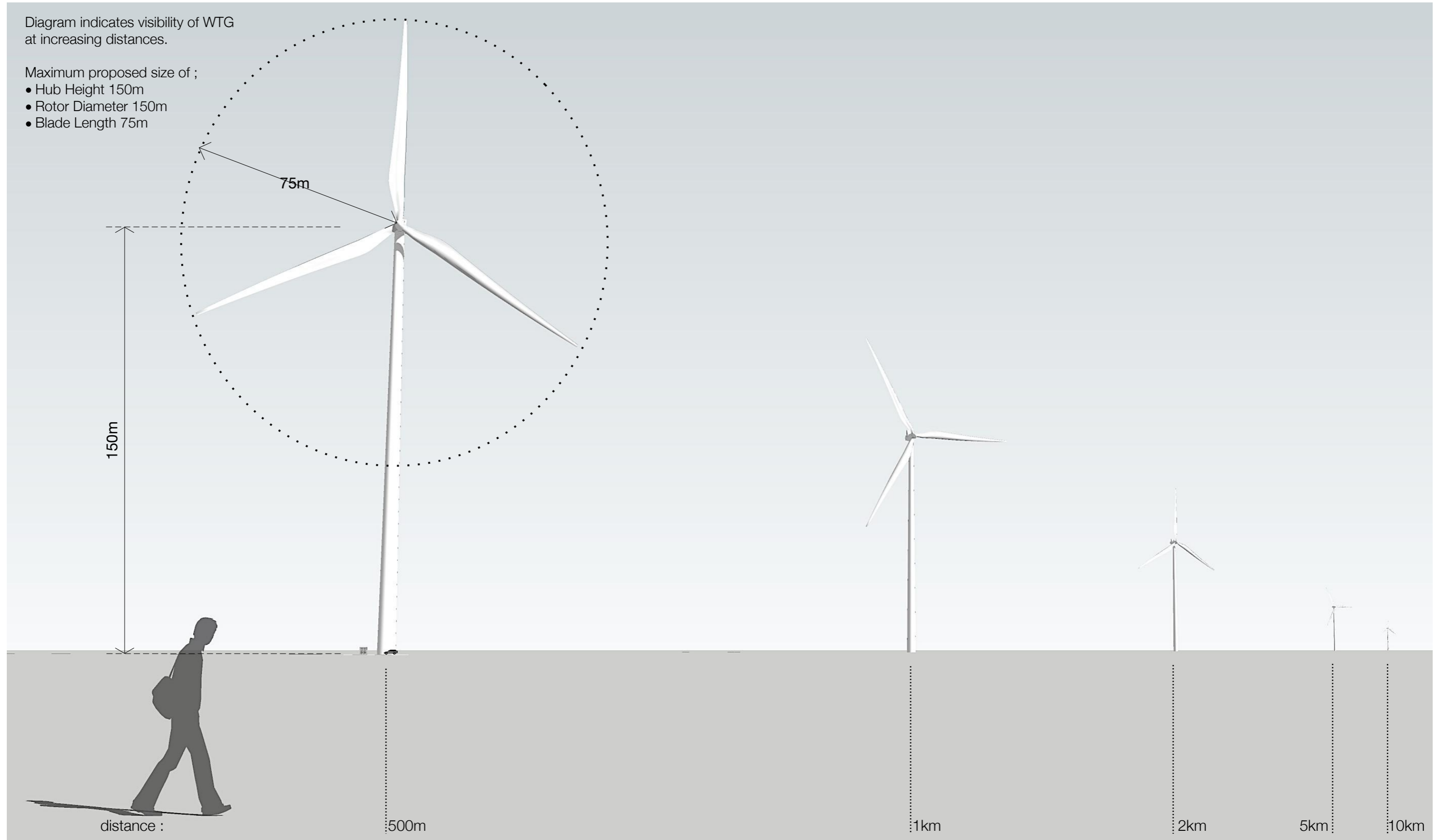


Figure 1 : IMPOFU West Wind Farm : 3D Models : Wind Turbine Distances

Diagram indicates a notional 3D view of a Substation and adjacent Switching Station

Assumed size of ;

- 150 x 150m footprint
- Internal gantry heights of 10 - 12m
- Buildings normal 3.5 - 5m heights
- Monopole transmission pylons 15m high

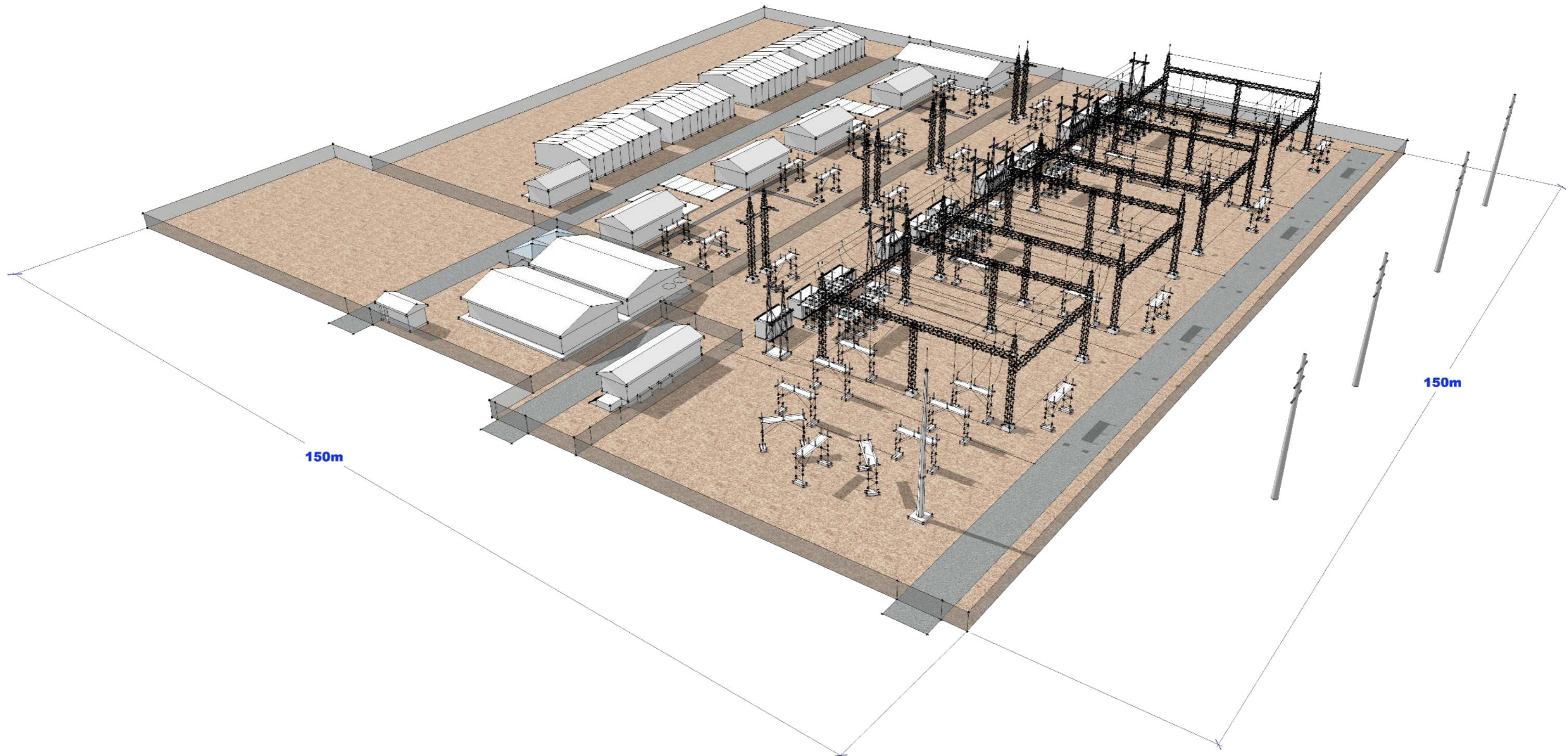


Figure 2 : IMPOFU West Wind Farm : 3D Models : Notional SubStation and Switching Station



Viewpoint 4 : Moderate to highly visible looking east from Sarnia Farm

34.10789 S, 24.47039 E distance 4.13km



Viewpoint 4 : IMPOFU West also showing proposed IMPOFU East Wind Farm in the distance

34.10789 S, 24.47039 E distance 4.13km

Figure 3 : IMPOFU West Wind Farm : Selected Photomontages

photos and montages : bola, qarc 2017 - 2019



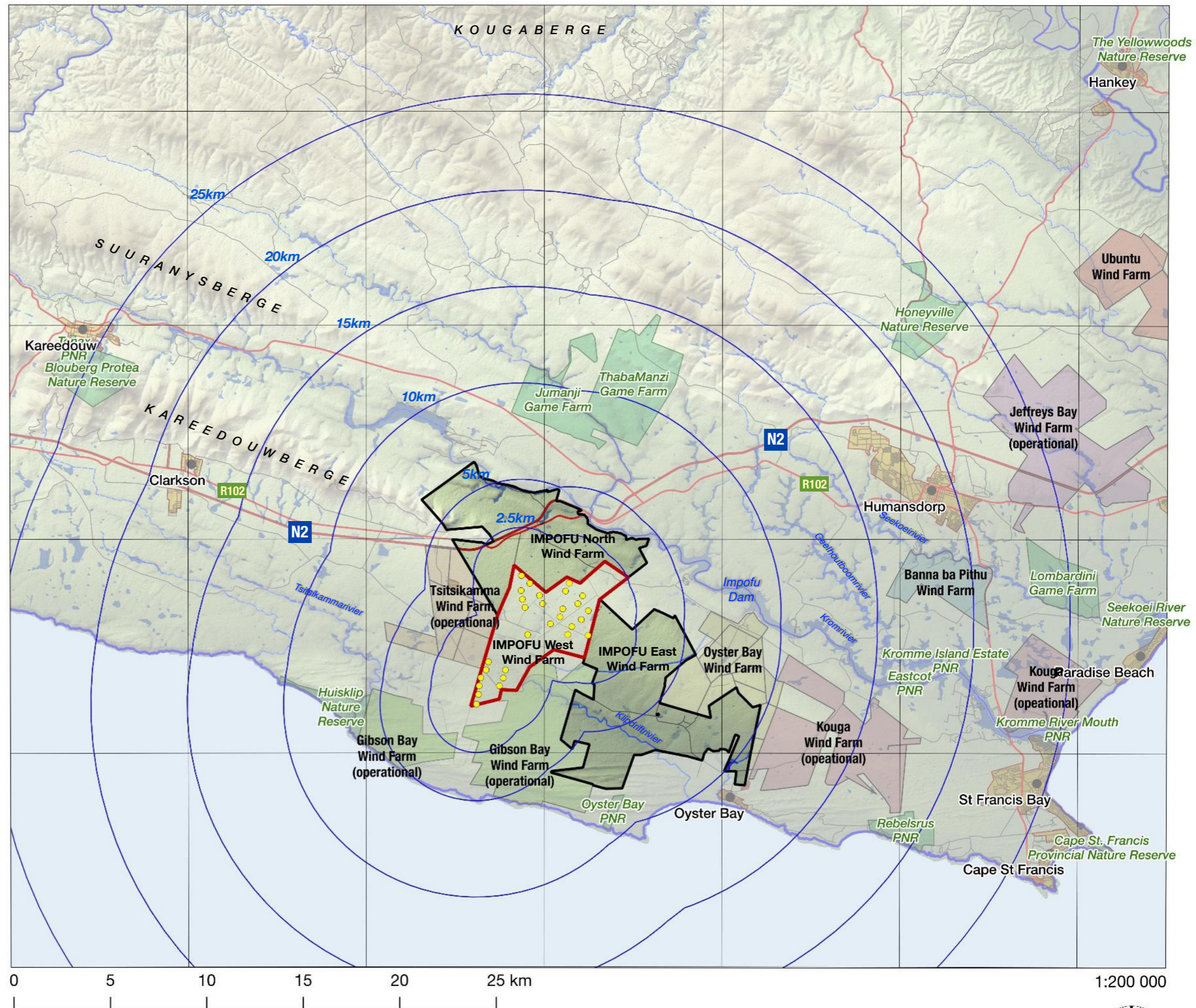
Viewpoint 6 : Highly visible from Villa Fonte Farm Gate

34.10139 S, 24.50186 E distance 1.89km



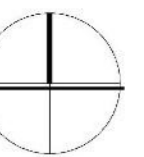
Viewpoint 9 : Brandewynkop Farm IMPOFU West also showing proposed IMPOFU North Wind Farm

34.11702 S, 24.56097 E distance 2.45km








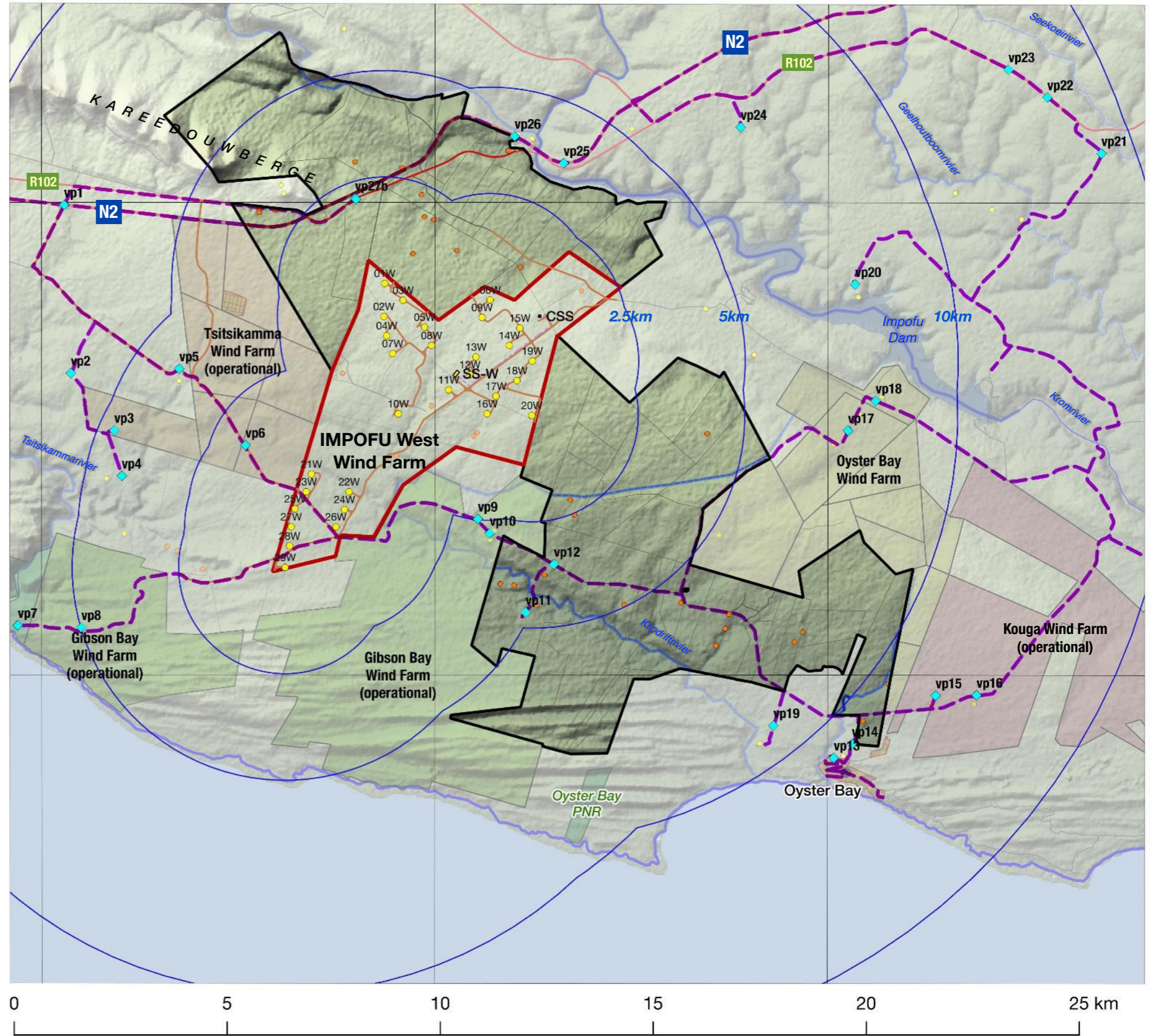
Base Map : SRTM 1arcSEC 30m DEM Physiography : GIS Data

Map 1 : IMPOFU West Wind Farm : Local Context



Legend :

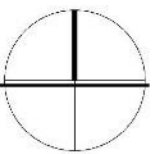
-  Settlements, Towns, Villages
-  IMPOFU West WTGs, Access Roads
-  Farmsteads, Residences
-  Fieldwork Route
-  Viewpoints










1:100 000

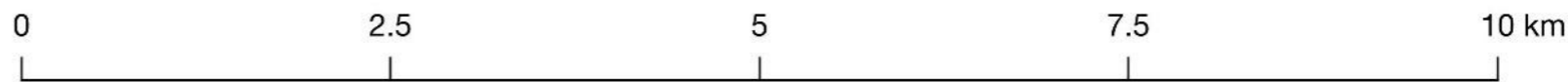
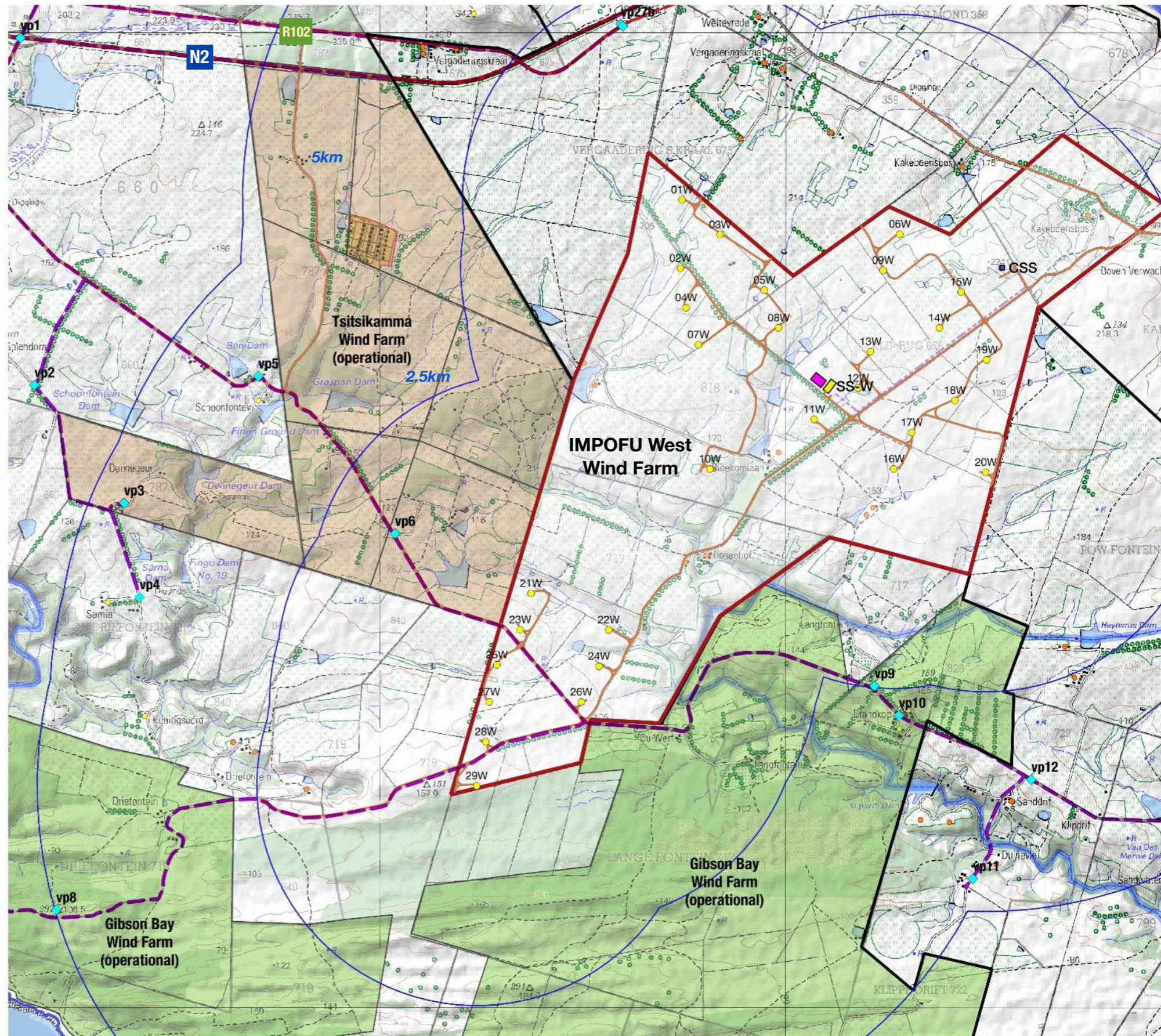
Base Map : SRTM 1arcSEC 30m DEM Physiography : GIS Data

Map 2 : IMPOFU West Wind Farm : Fieldwork and Viewpoints



Legend :

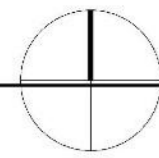
-  Settlements, Towns, Villages
-  IMPOFU West WTGs, Access Roads
-  IMPOFU West SubStation, Connection Line, Site Camp, Laydown Area (pink)
-  Farmsteads, Residences
-  Fieldwork Route
-  Viewpoints
-  Tree Lines



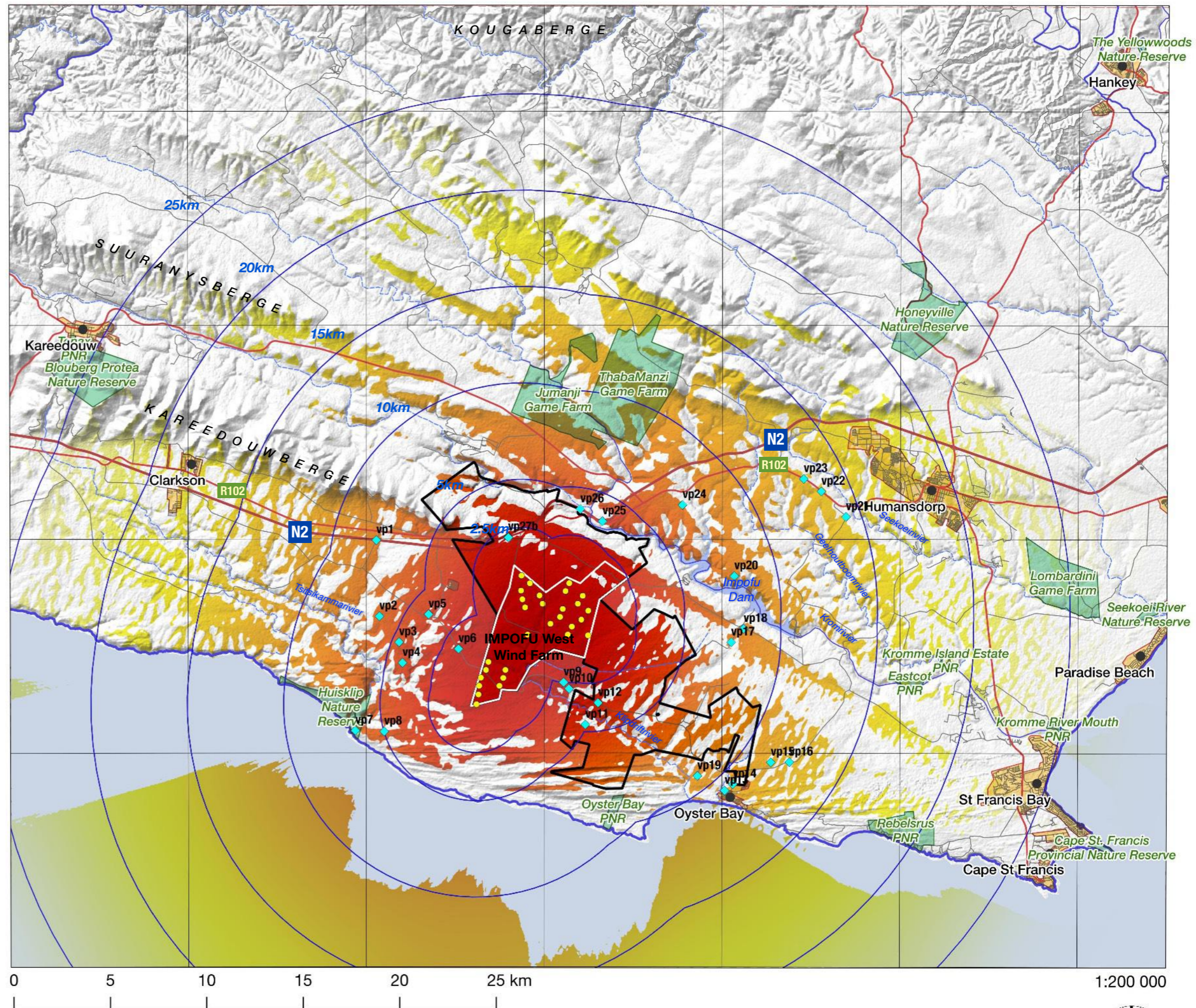
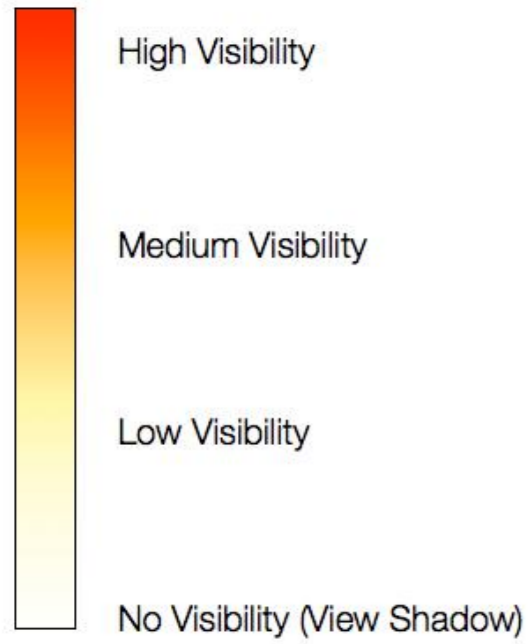
1:50 000

Base Map : SRTM 1arcSEC 30m DEM Physiography : NGI 1:50000 Topographic Series 3424 BA Kruisfontein, BB Humansdorp : GIS Data

Map 3 : IMPOFU West Wind Farm : Layout and Topography

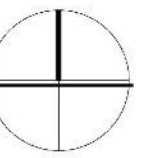


Viewshed Legend :

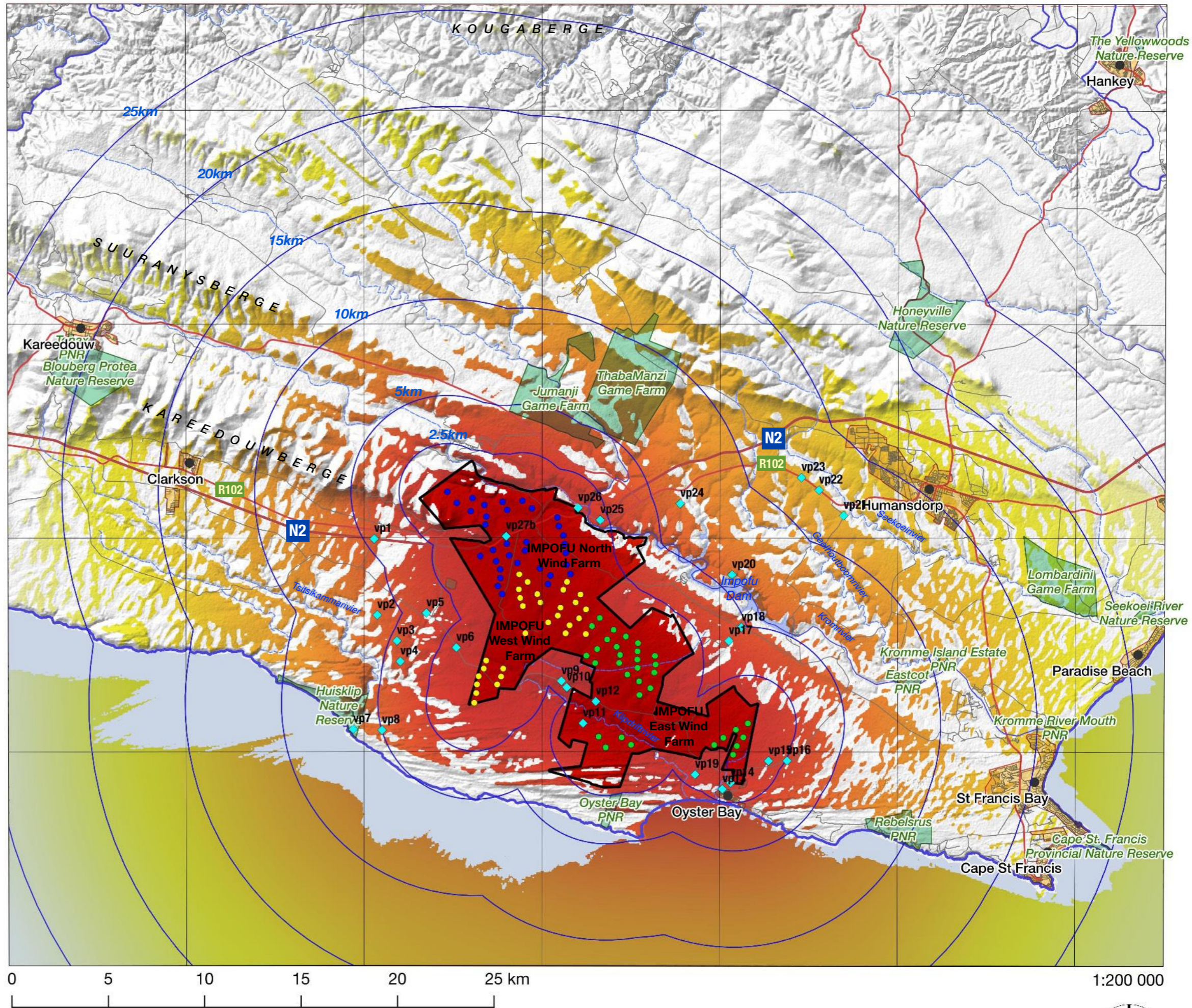
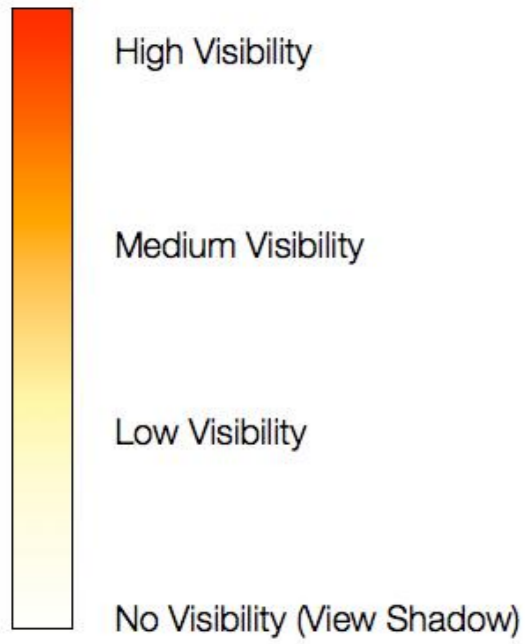


Base Map : SRTM 1arcSEC 30m DEM : GIS Data

Map 4 : IMPOFU West Wind Farm : Viewshed

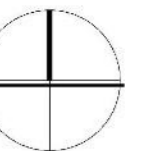


Viewshed Legend :










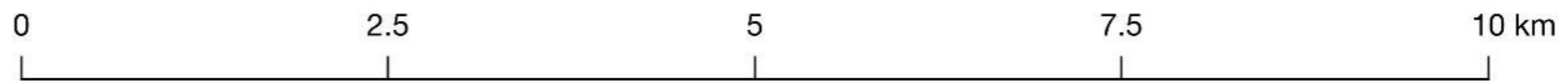
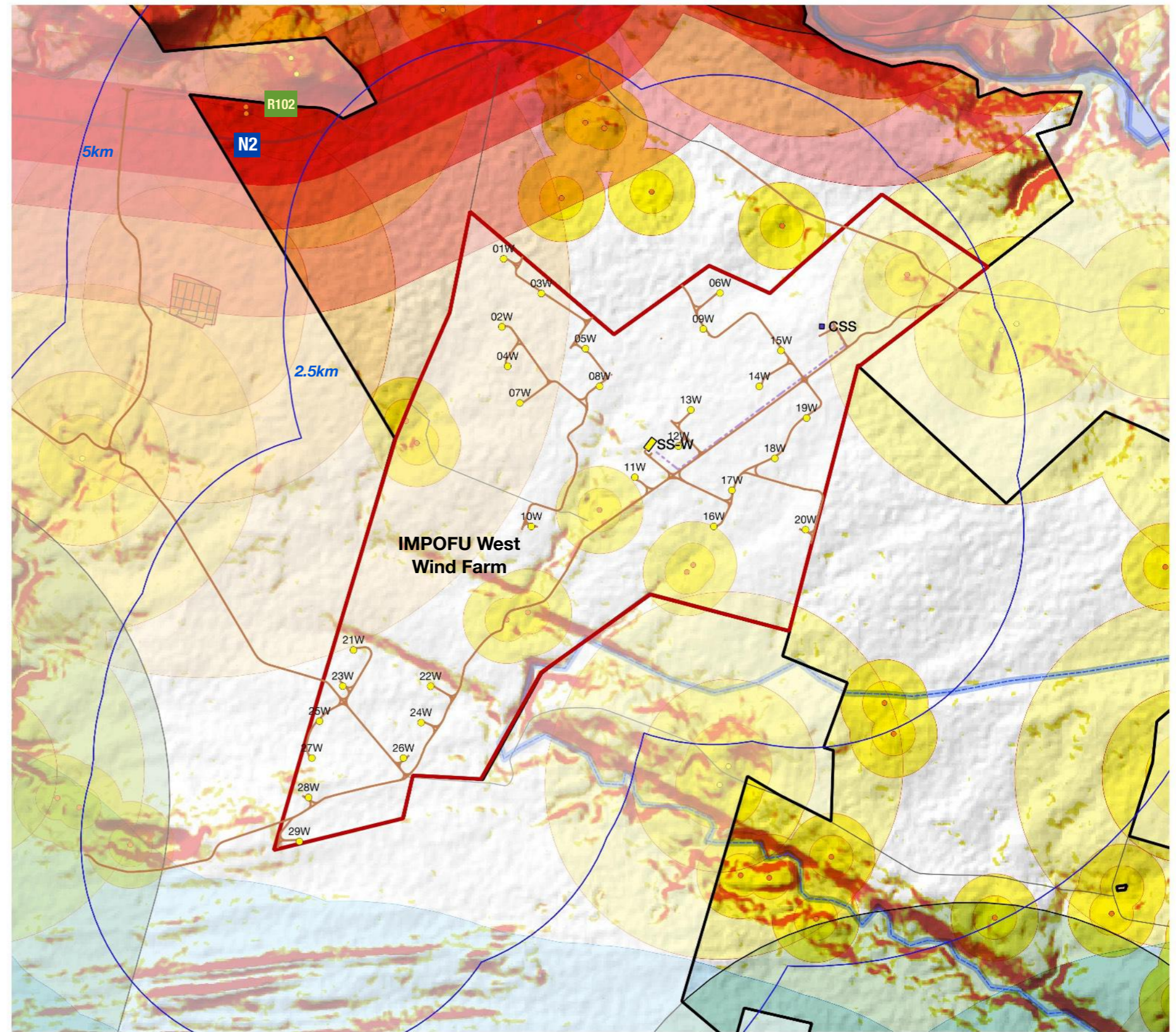
Base Map : SRTM 1arcSEC 30m DEM : GIS Data

Map 5 : IMPOFU North, West, East Wind Farms : Combined Viewshed

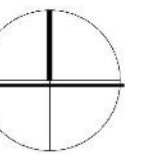


Legend :

-  **YELLOW** 1:10 - 1:5 slopes
-  **RED** <1:5 slopes
-  Farmsteads, Residences
-  N2, R102 Arterial Route buffers
-  Protected Area buffers
-  Town buffers
-  Water Features

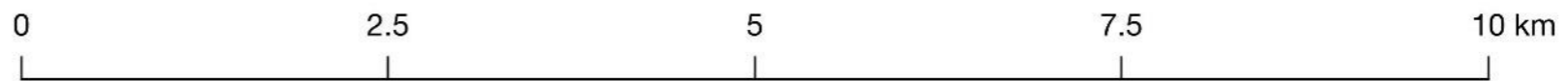
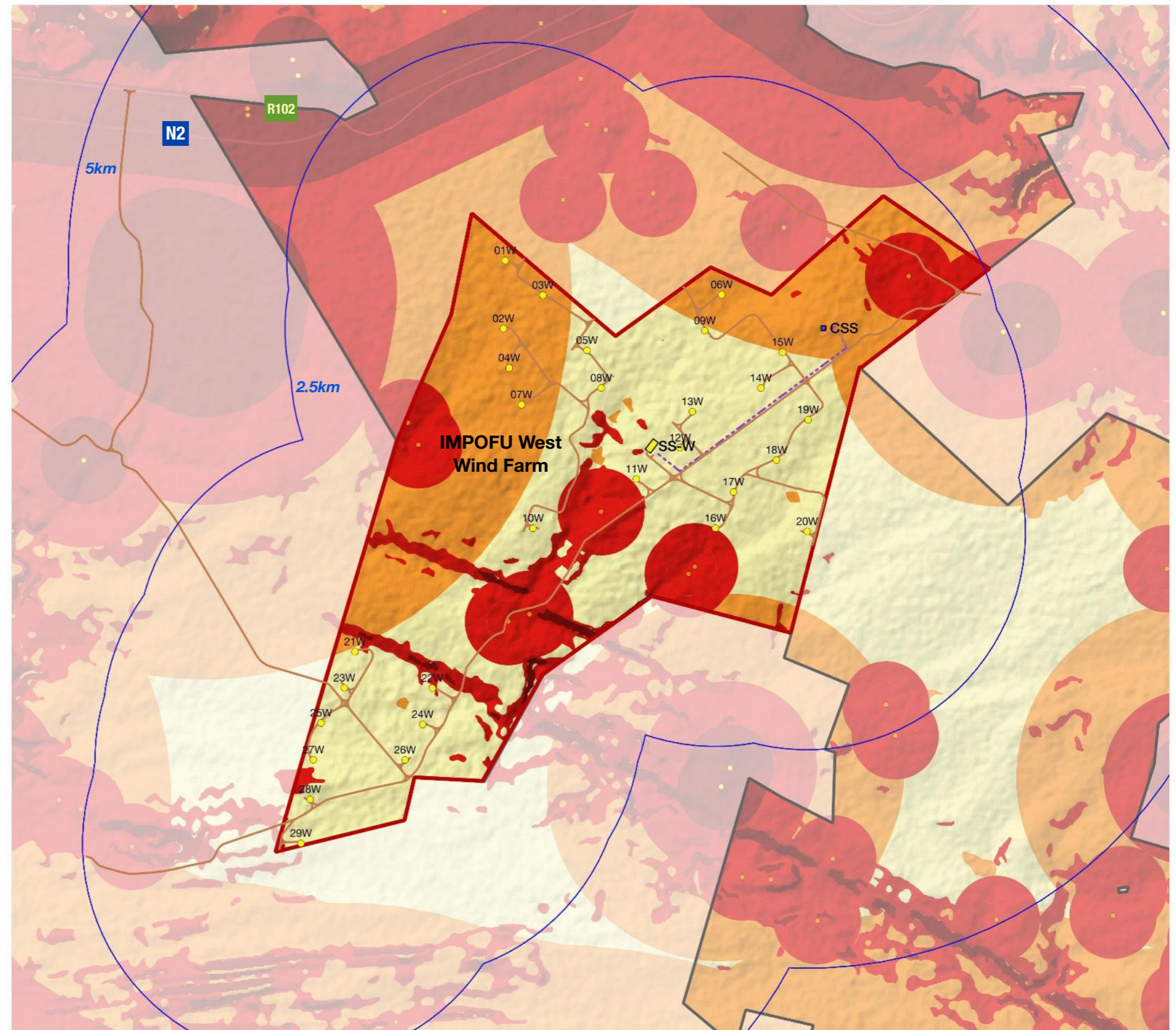


1:50 000



Visual Sensitivity Legend :

- Very High
- High
- Moderate
- Low



1:50 000

