VISUAL IMPACT ASSESSMENT FOR THE PROPOSED LATRODEX WIND ENERGY FACILITY, HAGA HAGA, EASTERN CAPE, SOUTH AFRICA

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PREPARED FOR:

CES - Environmental and social advisory services

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Latrodex (Pty) Ltd

DATE:

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Report number:	04

DECLARATION

I, **Tosca Grünewald**, as an independent consultant compiled this Visual Impact Assessment and declare that it correctly reflects the findings made at the time of the report's compilation. I further declare that I, act as an independent consultant in terms of the following:

- Do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act107 of 1998);
- Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act,1998 (Act 107 of 1998);
- Based on information provided to me by the project proponent, and in addition to information obtained during the course of this study, will present the results and conclusion within the associated document to the best of my professional judgement.

Tosca Grünewald
Landscape Architect & Environmental Assessment Practitioner
SACLAP Reg nr: 20421
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1. INTRODUCTION

1.1. QUALIFICATION AND EXPERIENCE OF THE PROFESSIONAL TEAM

Nuleaf Planning and Environmental (Pty) Ltd, specialising in Visual Impact Assessments, undertook the visual assessment for the proposed development.

The team undertaking the visual assessment has extensive practical knowledge in spatial analysis, environmental modelling and digital mapping, and applies this knowledge in various scientific fields and disciplines. The expertise of these practitioners is often utilised in Environmental Impact Assessments, State of the Environment Reports and Environmental Management Plans.

The visual assessment team is familiar with the "Guidelines for Involving Visual and Aesthetic Specialists in EIA Processes" (Provincial Government of the Western Cape: Department of Environmental Affairs and Development Planning) and utilises the principles and recommendations stated therein to successfully undertake visual impact assessments. Although the guidelines have been developed with specific reference to the Western Cape Province of South Africa, the core elements are more widely applicable.

Nuleaf Planning and Environmental have been appointed as an independent specialist consultant to undertake the visual impact assessment. Neither the author, nor Nuleaf Planning and Environmental will benefit from the outcome of the project decision-making.

1.2. LEGAL FRAMEWORK

The following legislation and guidelines have been considered in the preparation of this report:

- The Environmental Impact Assessment Amendment Regulations, 2017;
- Guideline on Generic Terms of Reference for EAPs and Project Schedules (DEADP, Provincial Government of the Western Cape, 2011).
- Guideline for Involving Visual and Aesthetic Specialists in EIA Processes (DEADP, Provincial Government of the Western Cape, 2005).

1.3. INFORMATION BASE

This assessment was based on information from the following sources:

- Topographical maps and GIS generated data were sourced from the Surveyor General, Surveys and Mapping in Mowbray, Cape Town;
- Observations made and photographs taken during site visits;
- Professional judgement based on experience gained from similar projects; and
- Literature research on similar projects.

1.4. ASSUMPTIONS AND LIMITATIONS

This Report has been prepared by Nuleaf on behalf, and at the request, of CES to provide them with an independent specialist assessment and review. Unless otherwise agreed by Nuleaf in writing, Nuleaf does not accept responsibility or legal liability to any person other than the CES for the contents of, or any omissions from, this Report.

To prepare this Report, Nuleaf utilised only the documents and information provided by CES or any third parties directed to provide information and documents by CES. Nuleaf has not consulted any other documents or information in relation to this Report, except where otherwise indicated. The findings, recommendations and conclusions given in this report are based on the author's best scientific and professional knowledge, as well as, the available information. This report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken. Nuleaf and its staff reserve the right to modify aspects of the report including the recommendations if and when new information may become available from on-going research or further work in this field, or pertaining to this investigation.

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This report must not be altered or added to without the prior written consent of the author. This also refers to electronic copies of this report which are supplied for the purposes of inclusion as part of other reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must make reference to this report. If this report is used as part of a main report, the report in its entirety must be included as an appendix or separate section to the main report.

This assessment was undertaken during the planning stage of the project and is based on information available at that time. It is assumed that all information regarding the project details provided by CES and the Applicant is correct and relevant to the proposed project. No public participation had been undertaken at the time of this draft VIA Report, and will only commence once the Basic Assessment Report (BAR) has been prepared. This Visual Impact Assessment and all associated mapping has been undertaken according to the worst-case scenario.

1.5. LEVEL OF CONFIDENCE

Level of confidence[1] is determined as a function of:

- The information available, and understanding of the study area by the practitioner:
    - **3**: A high level of information is available of the study area and a thorough knowledge base could be established during site visits, surveys etc. The study area was readily accessible.
    - **2**: A moderate level of information is available of the study area and a moderate knowledge base could be established during site visits, surveys etc. Accessibility to the study area was acceptable for the level of assessment.
    - **1**: Limited information is available of the study area and a poor knowledge base could be established during site visits and/or surveys, or no site visit and/or surveys were carried out.

- The information available, understanding of the project and experience of this type of project by the practitioner:
    - **3**: A high level of information and knowledge is available of the project and the visual impact assessor is well experienced in this type of project and level of assessment.
    - **2**: A moderate level of information and knowledge is available of the project and the visual impact assessor is moderately experienced in this type of project and level of assessment.
    - **1**: Limited information and knowledge is available of the project and the visual impact assessor has a low experience level in this type of project and level of assessment.

These values are applied as follows:

	Information on the project & experience of the practitioner			
Information on the study area		**3**	**2**	**1**
	3	9	6	3
	2	6	4	2
	1	3	2	1

Table 1: Roles and responsibilities outlined for each applicable party on site

The level of confidence for this assessment is determined to be **9** and indicates that the author's confidence in the accuracy of the findings is Moderate to High:

- The information available, and understanding of the study area by the practitioner is rated as **3**
- The information available, understanding and experience of this type of project by the practitioner is rated as **3**

[1] Adapted from Oberholzer (2005).

2. METHODOLOGY

The study was undertaken using Geographic Information Systems (GIS) software as a tool to generate viewshed analyses and to apply relevant spatial criteria to the proposed development. A detailed Digital Terrain Model (DTM) for the study area was created from 5m interval contours from the National Geo-spatial Information data supplied by the Department: Rural Development and Land Reform.

The approach utilised to identify potential issues related to the visual impact included the following activities:

- Undertaking a site visit;
- The creation of a detailed digital terrain model (DTM) of the potentially affected environment;
- The sourcing of relevant spatial data. This includes cadastral features, vegetation types, land use activities, topographical features, site placement, etc.;
- The identification of sensitive environments upon which the proposed Latrodex Wind Energy Facility (WEF) and associated infrastructure could have a potential visual impact;
- The creation of viewshed analyses from the proposed amended area in order to determine the visual exposure and the topography's potential to absorb the potential visual impact. The viewshed analyses take into account the dimensions of the proposed structures.
- A cumulative viewshed analysis in order to determine the potential cumulative exposure (visibility) of the proposed Latrodex WEF together with any other WEF's proposed or already constructed in the region.

This report (visual impact assessment) sets out to identify and quantify the possible visual impacts related to the proposed Latrodex Wind Energy Facility (WEF) and associated overhead powerlines (OHL), as well as, offer potential mitigation measures, where required. The methodology as described below has been followed for the assessment of visual impact.

UNDERTAKE A SITE VISIT

A site visit was undertaken in order to verify the results of the spatial analyses and to identify any additional site-specific issues that may need to be addressed in the VIA report. The season was not a consideration, nor had any effect on the carrying out of the visual assessment. A photographic survey was made of the site and surrounding potentially affected area from several selected viewpoints. The site visit was undertaken on the 15 September 2021.

DETERMINE THE POTENTIAL VISUAL EXPOSURE

The visibility or visual exposure of any development is the point of departure for the visual impact assessment. It stands to reason that if the proposed development were not visible, no impact would occur.

Viewshed analyses of the proposed development indicates the potential visibility.

DETERMINE THE VISUAL DISTANCE AND OBSERVER PROXIMITY

In order to refine the visual exposure of the development on surrounding areas/receptors, the principle of reduced impact over distance is applied in order to determine the core area of visual influence.

Proximity radii for the proposed alignment corridors are created in order to indicate the scale and viewing distance of the development and to determine the prominence thereof in relation to their environment.

The visual distance theory and the observer's proximity to the development are closely related, and especially relevant, when considered from areas with a high viewer incidence and a predominantly negative visual perception of the proposed development.

DETERMINE VIEWER INCIDENCE, PERCEPTION AND SENSITIVITY

The number of observers and their perception of a development determine the concept of visual impact. If there are no observers, then there would be no visual impact. If the visual perception of a structure is favourable to all observers, then the visual impact would be positive.

It is therefore necessary to identify areas of high viewer incidence and to classify certain areas according to the observer's visual sensitivity towards the proposed development and its related infrastructure.

It would be impossible not to generalise the viewer incidence and sensitivity to some degree, as there are many variables when trying to determine the perception of the observer; regularity of sighting, cultural background, state of mind, and purpose of sighting which would create a myriad of options.

DETERMINE THE VISUAL ABSORPTION CAPACITY (VAC)

This is the capacity of the receiving environment to absorb the potential visual impact of the proposed development. The digital terrain model utilised in the calculation of the visual exposure of the development does not incorporate the potential visual absorption capacity (VAC) of the natural vegetation of the region. It is therefore necessary to determine the VAC by means of the interpretation of the vegetation cover and other landscape characteristics.

DETERMINE THE VISUAL IMPACT INDEX OF THE PROPOSED DEVELOPMENT

The results of the above analyses are merged in order to determine where the areas of likely visual impact would occur. These areas are further analysed in terms of the previously mentioned issues (related to the visual impact) and in order to judge the magnitude of each impact.

DETERMINE THE IMPACT SIGNIFICANCE

The potential visual impacts identified and described are quantified in their respective geographical locations in order to determine the significance of the anticipated impact. Significance is determined as a function of extent, duration, magnitude and probability.

DETERMINE THE CUMULATIVE VIEWSHED

A cumulative visual impact can be defined as the combined or incremental effects resulting from changes caused by a proposed development in conjunction with other existing or proposed activities. The visual assessment for this development includes a cumulative viewshed analysis in order to determine the visual exposure (visibility) of the currently authorised 36 turbines for the proposed Haga Haga WEF together with the potential exposure of the Latrodex WEF.

GENERATE PHOTO SIMULATIONS

Photographs from strategic viewpoints were taken in order to illustrate the potential realistic post construction views of the WEF within its receiving environment. This aids in visualising the perceived visual impact of the proposed WEF and placing it in spatial context. The purpose of the photo simulation exercise is to support the findings of the VIA, and is not an exercise to illustrate what the facility will look like from all directions. Additional cumulative photo simulations were also undertaken in order to demonstrate the potential post construction view should the proposed Latrodex WEF and the authorised Haga Haga WEF both be constructed.

FORMULATION OF MITIGATION MEASURES

Recommendation of mitigation measures (if possible) to avoid or minimise potential negative visual impacts of the proposed development, for inclusion in the EMPr and authorisation conditions.

3. PROJECT DESCRIPTION

Latrodex (Pty) Ltd is proposing the establishment of a Wind Energy Facility (WEF) to generate approximately 15 Megawatts (MW) of renewable energy on one (1) property near Haga Haga in the Great Kei Local Municipality in the Eastern Cape Province. The project is collectively referred to as the **Latrodex WEF** as it is located within the property boundary of the Wild Coast Abalone (WCA) Facility. WCA will be the sole receiver of the power generated by the WEF, however should excess power be produced this will then be fed back into the grid.

A WEF generates electricity by means of wind turbine generators (WTG) that harness the wind of the area as a renewable source of energy. Wind energy generation, or wind farming as it is commonly referred to, is generally considered to be an environmentally friendly electricity generation option.

In order to optimise the use of the wind resource and the amount of power generated by the facility, the number of wind turbines erected in the area, as well as, the careful placement of the turbines in relation to the topography must be considered. Latrodex (Pty) Ltd intends to construct up to five (5) WTG on two farms, namely Farm 456 (owned by the Applicant Latrodex (Pty) Ltd) and Farm 459 (owned by Wild Coast Abalone (Pty) Ltd). Three (3) WTG will be located on Farm 456 and two (2) on Farm 459.

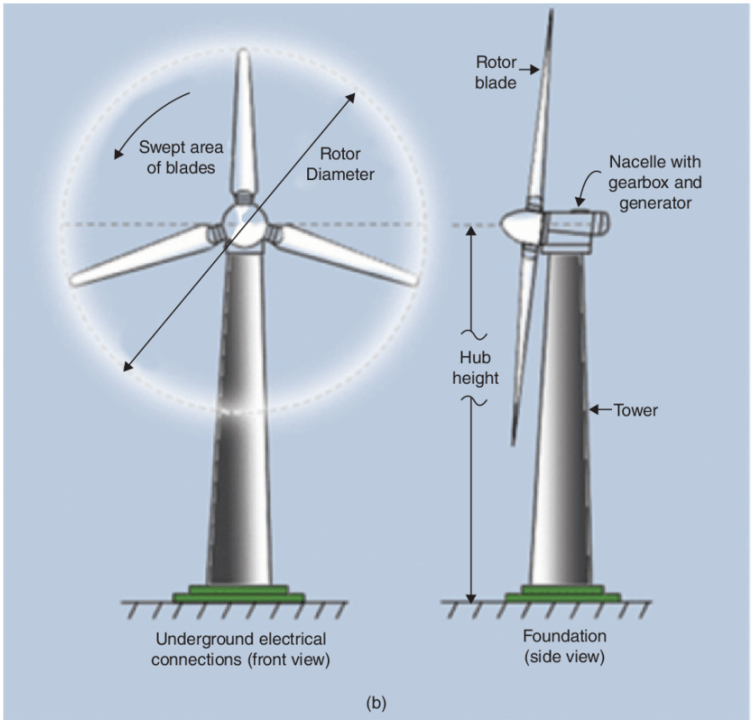


Figure 1: Illustration of the main components of a wind turbine[2]

Each wind turbine is expected to consist of a concrete foundation, a steel tower, a hub (placed at 80m above ground level) and three turbine blades attached to the hub as illustrated in Figure 1. The rotor diameter is expected to be 90m, culminating in an overall height of 125m (maximum blade tip height) per wind turbine. Variations of the above dimensions may occur, depending on the preferred supplier or commercial availability of wind turbines at the time of construction.

Component	Info
Wind turbine unit size	3 MW max
Rotor diameter	90m max
Hub height	80m max
Blade tip height	125m max
Number of wind turbines	5 max
Total WEF capacity	15 MW max

Table 2: Specifications of the proposed WTG as provided by the Applicant

Ancillary infrastructure associated with the Latrodex WEF may include the following:

- Cabling between the project components, to be lain underground where practical;
- Grid connections for the evacuation of power;
- Internal access roads; and

[2] Illustration courtesy of Charlier, R & Thys, A. (2016). Wind Power—Aeole Turns Marine. 10.1002/9781119066354.ch7.

- A workshop area for maintenance and storage (existing buildings located on the site will be utilised)

Subsequent to the writing of this report Latrodex requested that we assess five (5) alternative overhead powerline routes in terms of their feasibility from a visual perspective. Latrodex is proposing to construction a 22kVA overhead powerline to link to two substations, Chaba Substation in the west and Rivermouth Substation to the north. Refer to **Addendum A** for the findings of the visual assessment associated with the overhead powerlines.

The construction phase of the proposed facility is expected to be 1 year, whilst the lifespan of the facility is approximated at 20 to 30 years, however, since WCA is one of the largest energy users in the province as a result of the large volumes of seawater that they need to pump it is expected that as long as WCA is operational there will be a need for a WEF.

4. SCOPE OF WORK

The scope of work for this assessment includes the determination of the potential visual impacts in terms of nature, extent, duration, magnitude, probability and significance of the construction and operation of the proposed Latrodex WEF. Mitigation measures are recommended where appropriate. Anticipated issues related to the potential visual impact of the five (5) proposed WEF's include the following:

- Potential visual impacts associated with the construction phase on observers in close proximity to the proposed WEF.
- The Potential visual impact on sensitive visual receptors in close proximity to the proposed development (i.e., Haga Haga, Marschstrand, Kimbali Farms, Fish Bay and Haga Haga Retreat).
- The Potential visual impact on sensitive visual receptors in the region.
- The potential visual impact of operational, safety and security lighting of the facility at night in terms of light glare, light trespass and sky glow.
- The visibility of the proposed Latrodex WEF to, and potential visual impact on, users of arterial (R349) and secondary roads (Haga Haga and George Brown Drive - Morgans Bay Road).
- The potential visual impact of shadow flicker.
- The potential visual impact of the proposed infrastructure on the visual quality of the landscape and sense of place of the region with specific reference to the pastoral landscape, small coastal towns and tourist attractions (such as the Morgans Bay Cliffs and Double Mouth Nature Reserve).
- The potential cumulative visual impact of the proposed Latrodex WEF and associated infrastructure in context to the authorised Haga Haga WEF.
- Potential residual visual impacts after the decommissioning of the proposed Latrodex WEF.
- The potential to mitigate visual impacts and inform the design process.

5. THE AFFECTED ENVIRONMENT

The site is of the WEF is located just under a 1km north of the existing Wild Coast Abalone Facility, with the closest turbine position located at a distance of approximately 2.8km north east of the town of Haga Haga. Access to the site is provided by a small private road leading to a small settlement called Fish Bay via the Haga Haga secondary Road and the R349 arterial road to Kei Mouth.

Figure 2: Panoramic overlooking the hill where the site is located

The Proposed Latrodex WEF and associated infrastructure is located within the Amathole District Municipality and the site is located south of the Great Kei River within the Great Kei Local Municipality. The largest city within the region is East London, approximately 70km south-west of the site, with the N2 national road acting as the main connector between East London and site. Refer to **Map 1** and **Map 2** for the topography and land cover maps of the study area.

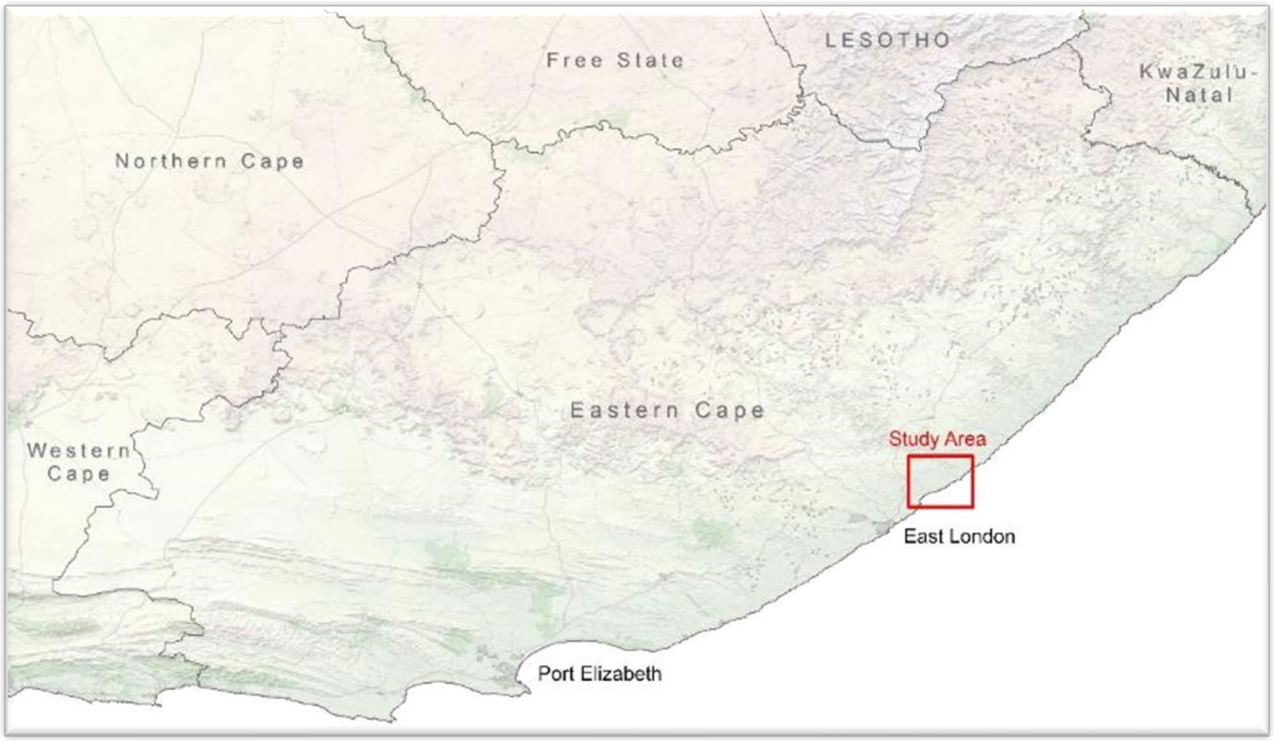


Figure 3: Regional locality of the study area of the proposed Latrodex WEF

This rugged coastline, commonly referred to as the Wild Coast, is a popular tourist attraction for people who prefer its remoteness and undeveloped nature. Although the Wild Coast historically only incorporated the coast line of the Transkei north of the Great Kei River, it now extends beyond the Great Kei River south all the way to East London.

Figure 4: The rugged coastline in the study area known as the Wild Coast

The study area of the WEF is located on land that ranges in elevation from sea level at the coast to approximately 580m above sea level to the north-west of the site. This undulating topography consists of rolling hills separated by shallow and in some place's deep valleys. Some of the rivers traversing the valleys in the study area are the Cintsa, Cefane, Kwenxura, Nyarha, Cwilli, Gxara, Ngogwane, Qolora, Haga-Haga, Mtendwe and Quko. The proposed WEF site is located on the hill between the Haga Haga and Quko rivers.

The WEF site is located within the Albany Thicket Biome and the farms comprising the proposed Latrodex WEF are located within the vegetation type known as the Albany Coastal Belt. This vegetation type is found along the coastline of the Indian Ocean from Kei Mouth to the Sundays River in the west. The Albany Coastal Belt vegetation is described by Musina and Rutherford *et al* (2006) as occurring on the gently to moderately undulating landscapes and dissected hilltop slopes close to the coast, dominated by short grasslands punctuated by scattered bush clumps or solitary *Vachellia natalitia* trees. The landscape of the study area therefore supports a mosaic of open thornveld with moderate stature, grasslands on the convex hills and slopes interspersed by the tall woody thicket vegetation of the valleys.

Figure 5: The undulating landscape of the study area interspersed with grasslands and scattered bush clumps

It should be noted, however, that large sections of both the study area have been heavily transformed by agricultural activities and is now used mainly for livestock farming (i.e., cattle) while the remaining natural vegetation is primarily found along steeper slopes and within river valleys.

Figure 6: Examples of the livestock farming taking place on the surrounding farms in the study area

This area south of the Kei River has a relatively low population density, with built up structures predominately located within the small coastal towns and settlements, the study area has a predominately natural and rural character. The few built structures located outside of the coastal towns and settlements within the region are predominately farm and homesteads associated with the agricultural activities taking place in the study area. Some of which are associated with tourist accommodation (i.e., OppiePlaas Cottages).

Figure 7: Example of small settlements in the study area – Haga Haga Retreat is located on the hill opposite the site

The only other noticeable infrastructure in the study area is Wild Coast Abalone, which is located on the proposed Latrodex WEF site itself. Tucked behind the dune vegetation it is one of the area's largest employers, a facility that is focused exclusively on the legal and sustainable breeding, growing, processing and exporting of *haliotis midae*, commonly known as abalone or perlemoen.

Figure 8: Wild Coast Abalone Facility as seen from the WEF site

As mentioned earlier, the coastline of the region is a popular tourist attraction, and as such tourism is considered to be an important industry, providing employment and income to the local population. Smaller and lesser known, yet popular, tourist destinations within the study area include Haga Haga, Haga Haga Retreat, Marshstrand, Morgans Bay, Morgans Bay Cliffs, Double Mouth Nature Reserve and Kei Mouth. There are also numerous tourist facilities further inland. The coastal villages of Marshstand and Haga Haga have been declared conservancies owing to the number of rare faunal species found in the area. The provincial Double Mouth Nature Reserve which is host to the Quko estuary and river mouth is a lesser known hidden gem known as one of the Eastern Cape's premier coastal camping destinations

Figure 9: View of the coastline towards the site from the Morgans Bay Cliffs a popular tourist destination in the area

Existing infrastructure on the site itself includes a farm house currently occupied by employers of WCA, workshop and sheds utilised in the everyday running of WCA and proposed to be utilised as the workshop and storage space for the WEF. There is also a private access road that leads to the residential dwellings of Fish Bay.

Figure 10: Existing access road, workshop area and storage sheds on the site

6. VIEWSHED ANALYSIS - WEF

6.1. VISUAL DISTANCE AND OBSERVER PROXIMITY

Nuleaf Planning and Environmental determined proximity offsets based on the anticipated visual experience of the observer over varying distances. In general, the severity of the visual impact on visual receptors decreases with increased distance from the proposed infrastructure. Therefore, in order to refine the visual exposure of the facility on surrounding areas/receptors, the principle of reduced impact over distance is applied in order to determine the core area of visual influence for the WEF. Proximity offsets for the proposed development footprint are thus established in order to indicate the scale and viewing distance of the facility and to determine the prominence of the structures in relation to their environment.

These proximity offsets are based on the anticipated visual experience of the observer over varying distances. The distances are adjusted upwards for larger facilities and downwards for smaller facilities (i.e., depending on the size and nature of the proposed infrastructure). This rationale was developed in the absence of any known and/or acceptable standards for South African WEF's. Therefore, for the purpose of this study, proximity offsets have been calculated from the expected boundary of the site, as indicated on **Map 3** and as follows:

- 0 – 5km. Short distance view where the facility would dominate the frame of vision and constitute a very high visual prominence.
- 5 - 10km. Short to medium distance view where the structures would be easily and comfortably visible and constitute a high to moderate visual prominence.
- 10 - 20km. Medium to long distance view where the facility would become part of the visual environment, but would still be visible and recognisable. This zone constitutes a moderate visual prominence.
- > 20km. Long distance view of the facility where the structures are not expected to be immediately visible and not easily recognisable. This zone constitutes a lower visual prominence for the facility.

The figure below helps to place the above explanations in context, illustrating what scale a turbine structure will be perceived at different viewing distances.

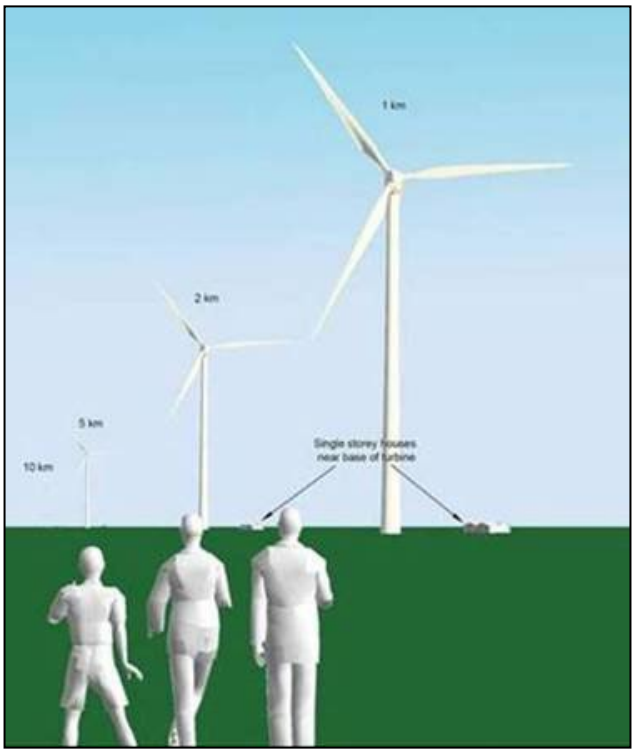


Figure 11: Visual experience of a 100m high wind turbine structure at a distance of 1km, 2km, 5km and 10km

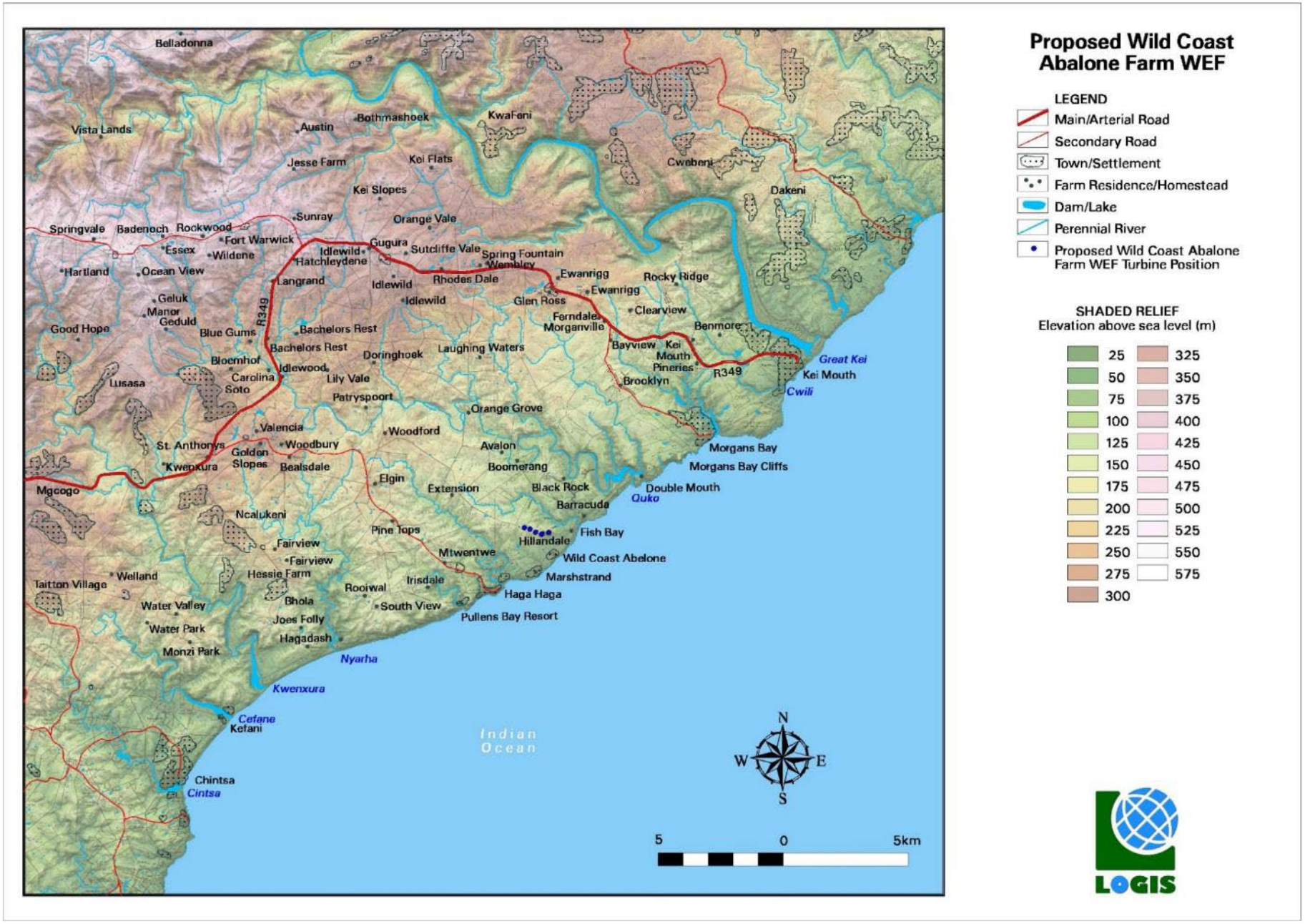
6.2. VIEWER INCIDENCE, PERCEPTION AND SENSITIVITY

Since the number of potential sensitive receptors and their perception of the development in question ultimately determines the concept of a visual impact (i.e., without receptors there would be no impact), the visual distance theory and the receptors proximity to the development works hand in hand, and is especially relevant, when considered from areas with a high viewer incidence and a potentially negative visual perception of the proposed facility. It is, therefore, necessary to identify areas of high viewer incidence and to classify certain areas according to the observer's visual sensitivity towards the proposed Latrodex WEF.

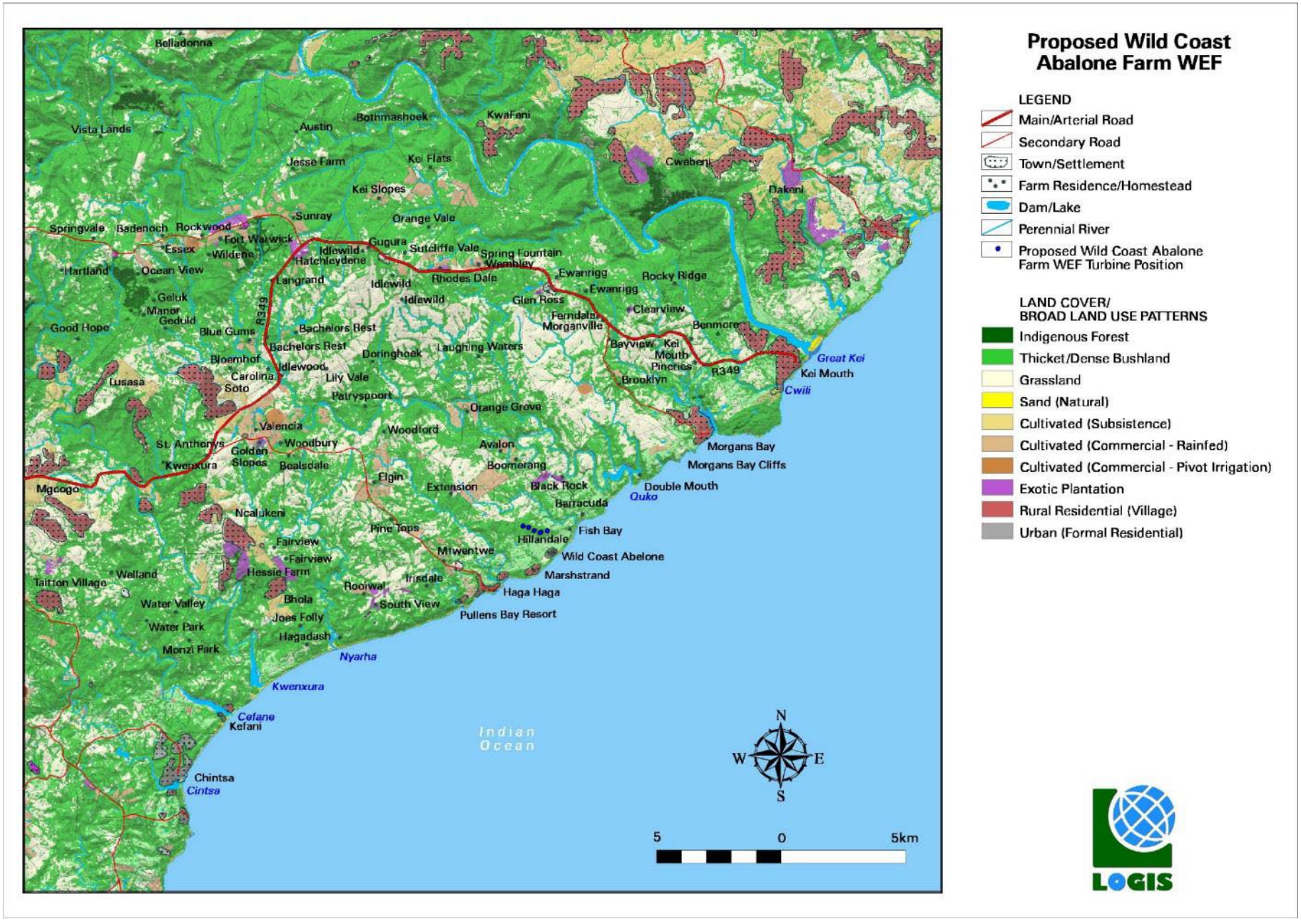
Homesteads / farmsteads, conservation and tourist areas (i.e., Double Mouth Nature Reserve, Morgans Bay Cliffs, etc.), by virtue of their visually exposed nature, are considered to be sensitive visual receptors. Viewer incidence is calculated to be the highest for the homesteads and tourism facilities within the areas closest to the facility, as well as, within the local built-up areas (i.e., the settlement of Haga Haga, Marshstrand, Fish Bay, etc). Second to these are the users along the provincial (i.e., R349) and secondary roads within the study area (Haga Haga Road). Commuters and possible tourists using these roads may be negatively impacted upon by visual exposure to the proposed infrastructure.

Residential receptors in natural contexts are more sensitive than those in more built-up contexts, due to the absence of visual clutter in these undeveloped and undisturbed areas. Receptors within built up areas are less sensitive to potential visual impact due to the presence of structures, infrastructure and general visual clutter. Those dwelling on the periphery may be more aware of visual intrusion and may thus be considered somewhat more sensitive.

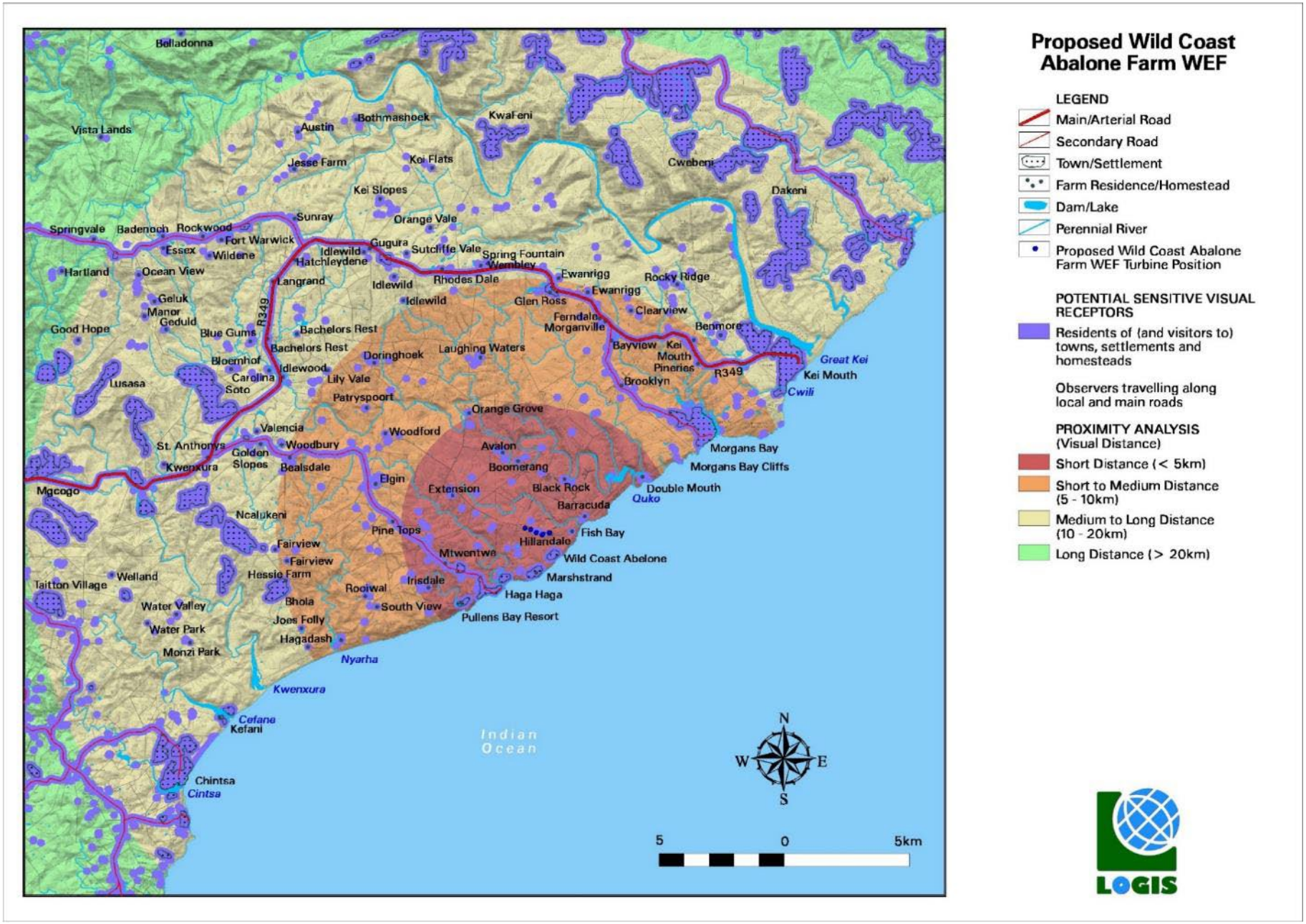
No specific report can be made on viewer perception regarding the proposed Latrodex WEF, as no reported stakeholder feedback has been received by the specialist. However, considering the proximity of the proposed facilities to the various coastal settlements (Haga Haga, Marshstarnd etc.) and the undeveloped nature of the surrounding area, it is expected that any potential visual impact would be viewed in a negative light. Therefore, overall viewer perception of receptors within the study area will be assumed to be mostly negative.



Map 1: Shaded relief map of the study area for the proposed Latrodex WEF



Map 2: Land cover / broad land use map of the study area for the proposed Latrodex WEF



Map 3: Visual proximity analysis, observer sensitivity and proximity of the proposed Latrodex WEF

The potential sensitive visual receptors within a 5km, 10km and 20km radius as identified on **Map 3** are as follows:

- < 5km – Short Distance

  Hillandale, residents of Haga Haga, residents of Marschstrand, Wild Coast Abelone, residents of Fish Bay, residents of Haga Haga Retreat, Mtwentwe, Barracuda, Black Rock, Boomerang, Extension, Avalon, Irisdale, Double Mouth Nature Reserve and the Haga Haga Secondary Road

- 5- 10km – Short to Medium Distance

  South View, Rooiwal, Hagadash, Joes Folly, Hessie Farm, Fairview, Pine Tops, Elgin, Bealsdale, Woodbury, Woodfors, Patryspoort, Doringhoek, Laughing Waters, Glen Ross, Ferndale, Morganville, Bayview, Orange Grove, Brooklyn, Kei Mouth Pineries, residents to Morgans Bay, visitors to the Morgans Bay Cliffs, R349, the secondary road to Morgans Bay and Haga Haga Secondary Road

- 10 - 20km – Medium to Long Distance

  Chinsta, Kefani, Monzi Park, Water Park, Water Valley, Welland, Taitton Village, Hessie Farm, Ncalukeni, Mgcogo, Kwenxura, Golden Slopes, Woodbury, Valencia, St. Anthonys, Lusasa, Soto, Carolina, Bloemhof, Idlewood, Bachelors Rest, Blue Gums, Geduld, Manor, Geluk, Good Hope, Ocean View, Essex, Wildene, Badenoch, Rockwood, Fort Warwick, Sunray, Langrand, Hatchleydene, Idlewild, Gugura, Jesse Farm, Austin, Bothmashoek, Kei Flats
  Kei Slopes, Orange Vale, Gugura, Sutcliffe Vale, Spring Fountain, Wembley, Rhodes Dale, Ewanrigg, Rocky Ridge, KwaFeni, Cwebeni, Dakeni, Benmore, Kei Mouth, the R349 and various other secondary roads.

6.3. VISUAL ABSORPTION CAPACITY

Visual Absorption Capacity (VAC) is the capacity of the receiving environment to absorb the potential visual impact of the proposed development. VAC is primarily a function of the vegetation and will be high if the vegetation is tall, dense and continuous. Conversely, low growing sparse and patchy vegetation will have a low VAC.

Since the land cover within the study area consists of open grassland and cultivated land / agricultural fields or pastures, dispersed by thicket and dense bushland, therefore not continuous tall dense vegetation, overall, the VAC of the receiving environment of the Latrodex WEF is deemed to be moderate to low by virtue of the inconsistent nature of the vegetation, as well as, the generally undeveloped nature of the study area. Where homesteads do occur, vegetation and trees may have been planted or where the surrounding thickets and bushland has not been cleared, it is expected that this will contribute to the visual absorption and the VAC will be higher. As this is not a consistent occurrence VAC will not be taken into account for any of the homesteads or settlements, again assuming a worst-case scenario.

The VAC would also be high where the environment can readily absorb the development in terms of texture, colour, form and light / shade characteristics. On the other hand, the VAC for a development contrasting markedly with one or more of the characteristics of the environment would be low. Since the significant height of WTG's adds to the potential visual intrusion of the WEF in the landscape and against the background of the horizon, the scale and form of the structures mean that it is unlikely that the environment will visually absorb them in terms of texture, colour, form and light/shade characteristics, therefore VAC in this case would be considered low.

The VAC also generally increases with distance, where discernible detail in visual characteristics of both environment and development decreases.

As a result of the varied consistency in the vegetation and the high contrast of the WTGs with the surrounding receiving environment VAC will not be taken into account for the visual impact assessment of the Latrodex WEF.

6.4. POTENTIAL VISUAL EXPOSURE

The result of the viewshed analyses for the proposed Latrodex WEF is shown on **Map 4** that follows. The analyses have been undertaken from each proposed turbine position as indicated within the proposed development areas in order to determine the general visual exposure (visibility) of the area under investigation. A height of 125m was used in order to illustrate the anticipated visual exposure of the wind turbines (i.e., the approximate maximum tip height of the proposed

wind turbines). Typically, structures of this height (i.e., 125m) may be visible from up to 20km away. In this respect, the anticipated Zone of Visual Influence for this facility as calculated from the development footprint (i.e., determined from the edge of the outer most turbines) has been indicated at 20km. The extent of visual exposure within this zone is very high.

The viewshed analyses do not include the effect of vegetation cover or existing structures on the exposure of the proposed facility, therefore signifying a worst-case scenario.

Map 4 indicates areas from which any number of turbines could potentially be visible as well as proximity offsets from the proposed development area. The following is an overview of the findings of the viewshed, based on the layout illustrated on the Map provided:

- The proposed facility will have a large core area of potential visual exposure on the project site itself, and within a 5km radius thereof. The deep valleys associated with the numerous rivers that traverse the study area to the north, north east, west and south west of the site offer some visual screening to these areas.

  Potential sensitive visual receptors within this visually exposed zone include observers travelling along the Haga Haga Road, as well as, residents of homesteads, farmsteads and several small coastal towns / settlements.

- Potential visual exposure remains high but scattered in the medium distance (i.e., between 5 and 10km), with visually screened areas predominantly associated with the river valleys to the south west, west, north west and north east (beyond the undulating hills).

  Sensitive visual receptors comprise users of secondary roads (R349, Haga Haga Road & the Morgan's Bay Road) visitors to the Morgans Bay Cliffs, as well as, residents of various farm and homestead.

- In the longer distance (i.e., between 10 and 20km offset), the extent of potential visual exposure is significantly reduced, especially in the northern portion of the study area, and to a lesser extent in the north east and west. Visually exposed areas tend to be concentrated in the north west and along portions of the R349.

  Sensitive visual receptors include users of stretches of the R349 in the north west. In addition, residents of farm and homesteads, particularly within the north western portion of the study area and, may be visually exposed.

- Beyond the 20km offset from the proposed site, potential sensitive visual receptors are not likely to be visually exposed to the proposed facility, despite lying within the viewshed.

In general, despite the scattered and lower population density of the study area, the Latrodex WEF may constitute a high visual prominence, potentially resulting in a high visual impact.

6.5. POTENTIAL CUMULATIVE VISUAL EXPOSURE

It is a requirement that a visual specialist identify and quantify the cumulative visual impacts of a proposed development, propose potential mitigating measures and conclude if the proposed development will result in any acceptable loss of visual resources taking into consideration the other proposed and operational projects in the area. A cumulative visual impact can be defined as the combined or incremental effects resulting from changes caused by a proposed development in conjunction with other existing or proposed activities. Therefore, the visual assessment for this development includes a cumulative viewshed analysis in order to determine the visual exposure (visibility) of the currently authorised 36 turbines for the proposed Haga Haga WEF together with the potential exposure of the proposed Latrodex WEF. The proposed Latrodex WEF is located approximately 3.5km (at the its closest point) from the authorised Haga Haga WEF.

Cumulative visual impacts may be experienced as a result of the following, where a combination of several WEF's turbines is within a receptors line of sight at the same time, where the receptor has to turn their head to see several of the WTGs of the different WEF's and when the receptor has to move from one viewpoint to another to either see different developments or different views of the same development (such as when travelling along a road).

The cumulative visual impact is not just the totality of the impacts of two developments. The combined impact may be greater than the sum of the two individual developments, or in rare cases even less. The cumulative visual impact is assessed as the product of the distance between the individual WEFs (or WTG), the total distance over which the WTG are

visible, the general character of the landscape and its sensitivity to that specific typology of development, the location and design of the WEFs themselves and lastly the way in which the landscape is experienced by the sensitive receptors.

For the purpose of this study, viewshed analyses from each WEF's turbines were undertaken in order to determine the area of potential combined visual exposure. A visibility analysis of the WTGs of the authorised Haga Haga WEF was undertaken individually from each of the approved turbine positions (36 in total) at an offset of 180m above ground level. The result of this viewshed analysis was overlain with the viewshed analysis of the proposed Latrodex WEF (addressed in this report) in order to identify the area of potential combined visual exposure (i.e., where both the proposed and existing structures may be visible). **Map 5** illustrates the anticipated cumulative visual impact. Areas shaded in red are likely to be exposed to both WEF facilities, areas shaded in green are likely to be exposed to the turbines of only the authorised Haga Haga WEF and areas shaded in purple are likely to be exposed to only the proposed Latrodex WEF. The purple areas are additional areas of exposure previously not expected to be impacted on visually by the authorised Haga Haga WEF.

A large overlap between the visual exposure of the two WEF layouts is noted, this is due to the two facilities close proximity to each other, as well as, the fairly large extent of the authorised Haga Haga WEF. Additionally, a portion of the overlap areas are noted to be taking place within the property boundaries of the authorised Haga Haga WEF. Potential areas where the cumulative visual impact will be experienced the most is for sensitive receptors looking inland from Haga Haga Retreat, the outskirts of Haga Haga, the high lying areas around Mtwentwe, Barracuda, Blcak Rock, Boomerang, Avalon, Orange Grove, the entrance to Double Mouth Nature Reserve and the Morgans Bay Cliffs.

There is also a relatively small additional area of exposure previously not expected to be impacted on visually by the authorised Haga Haga WEF (shaded in purple) as a result of the five (5) additional turbines proposed. This additional area of exposure is mainly limited to the site itself, Marshstand and the high lying areas to the south west of the site between the site and Mtwentwe. In relation to the already large visually exposed area of the Haga Haga WEF and since the Latrodex WEF only consists of five (5) additional wind turbines, generally considered to be a small WEF in international and local standards, it is not expected that the addition of the Latrodex WEF will contribute in a significant way to the cumulative visual exposure of WEFs in the region. It is therefore concluded that the overall cumulative visual impact is expected to be moderately low, at worst.

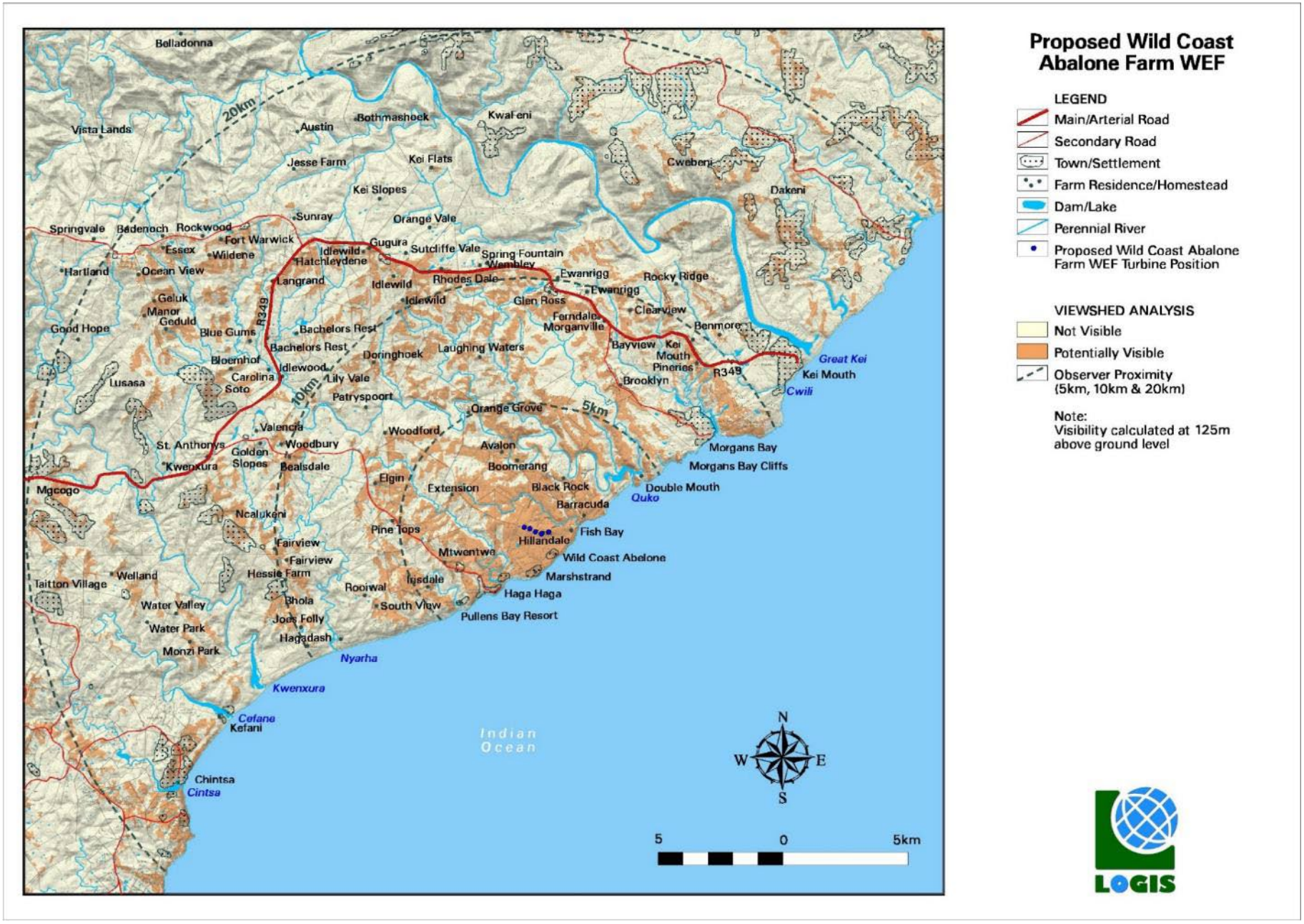
6.6. VISUAL IMPACT INDEX

The combined results of visual exposure, viewer incidence / perception and visual distance of the proposed facility are displayed on **Map 6**. Here the weighted impact and the likely areas of impact have been indicated as a visual impact index.

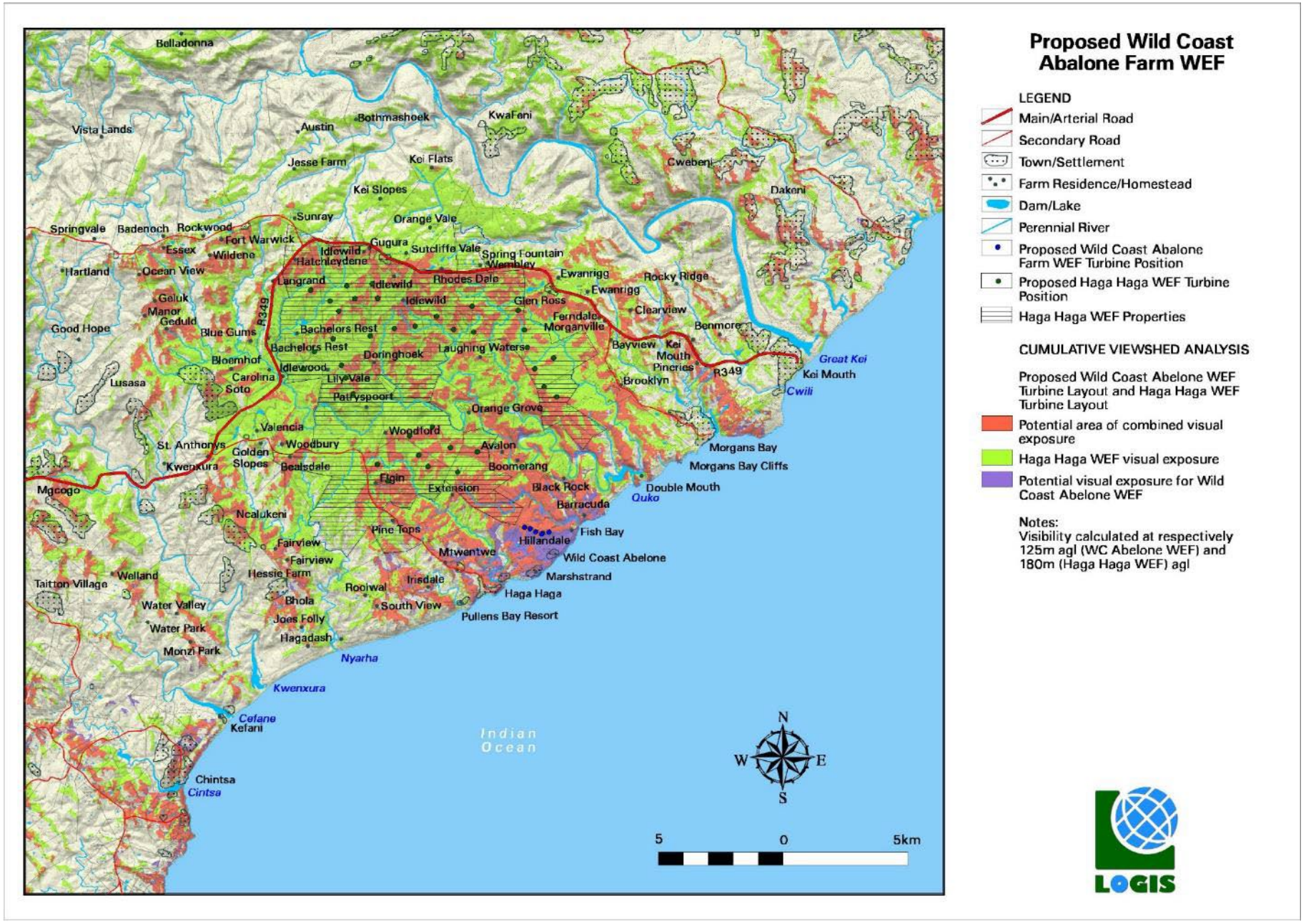
Values have been assigned for each potential visual impact per data category and merged in order to calculate the visual impact index. An area with short distance, a high viewer incidence and a predominantly negative perception would therefore have a higher value (greater impact) on the index. This helps in focussing the attention to the critical areas of potential impact when evaluating the issues related to the visual impact.

The visual impact index for the proposed facility is further described as follows.

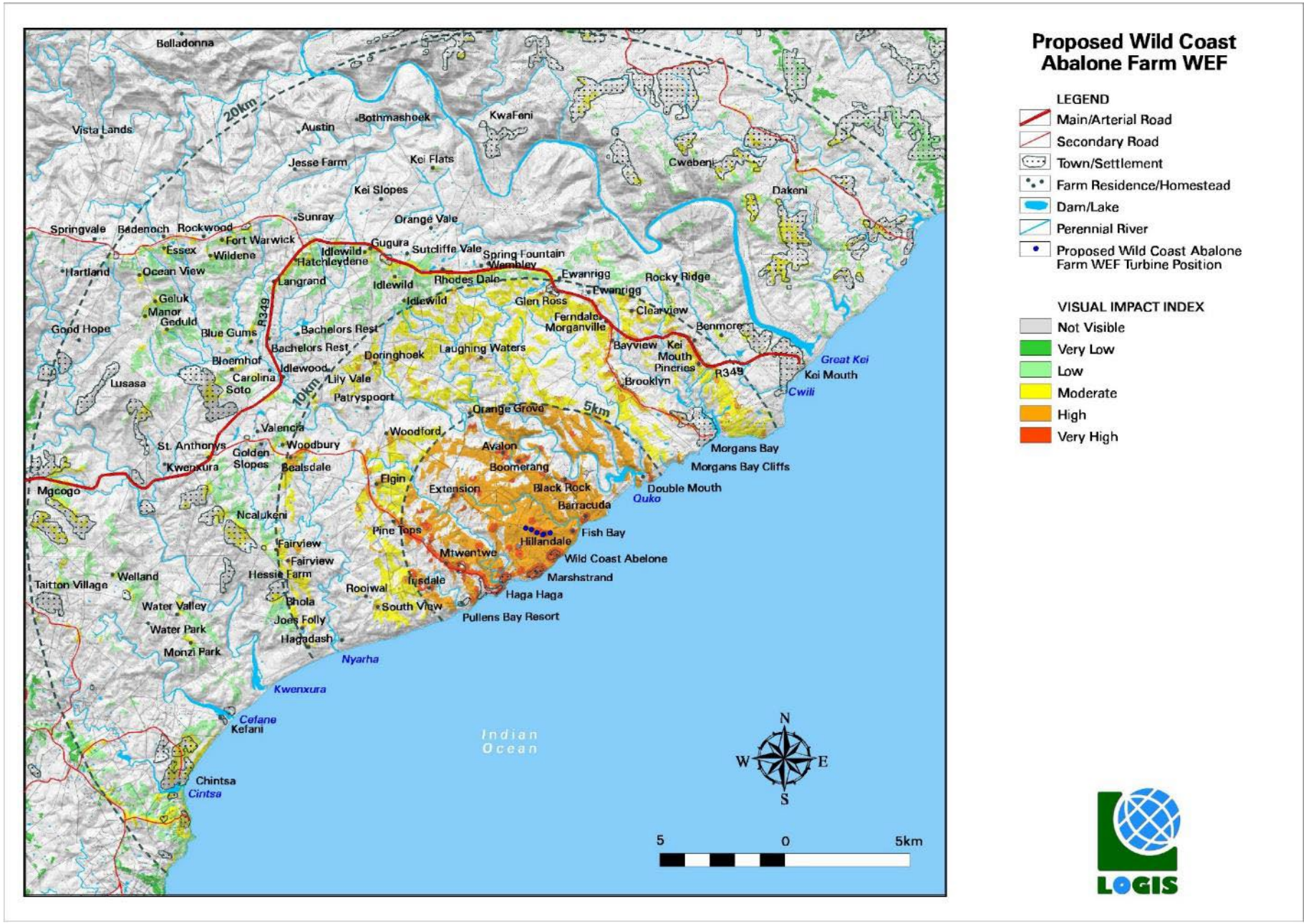
- The visual impact index map indicates a core zone of **high** visual impact within 5 km of the proposed facility. The identified sensitive receptors within 5km of the proposed development, as listed below, are likely to experience a **very high** visual impact due to their proximity to the proposed expansion, should no mitigation be undertaken. Sensitive visual receptors within this zone comprise mainly of the following users:
    - Wild Coast Abalone (the intended users of the power generated)
    - Haga Haga secondary road
    - Residents / tourists of the outlying areas of the coastal town of Haga Haga,
    - Settlement of Marshstrand, Haga Haga Retreat and Fish Bay,
    - Visitors to the entrance of Double Mouth Nature Reserve at their picture frame
    - Residents of the following farm or homesteads:
        - Mtwentwe (OppiePlaas Self Catering Cottages)
        - Black Rock
        - Barracuda
        - Boomerang
        - Avalon
        - Extension



Map 4: Potential visual exposure (viewshed analysis) of the proposed Latrodex WEF



Map 5: Potential cumulative visual exposure of the proposed Latrodex WEF and the authorised Haga Haga WEF



Map 6: Visibility Index illustrating the frequency of exposure of the proposed Latrodex WEF layout

- Visual impact is prominently **moderate** between 5 km and 10 km of the proposed facility. The identified sensitive visual receptors between 5km and 10km of the proposed development, as listed below, are likely to experience **high** visual impact, should no mitigation be undertaken. Sensitive visual receptors within this zone comprise mainly of the following users:
    - Users traveling along the R349, the Haga Haga secondary road and the Morgans Bay secondary road, potential visibility is however scattered along the length of the road and visual intrusion where possible will be brief
    - Visitors to the Morgans Bay Cliffs lookout point
    - Residents of the following settlements, farm or homesteads:
        - Orange Grove
        - Joes Folly
        - Hagadash
        - South View
        - Woodford*
        - Elgin*
        - Pine Tops*
        - Fairview
        - Bealsdale*
        - Doringhoek*
        - Laughing Waters
        - Ferndale
        - Clearview
        - Kei Mouth Pineries

  It must be noted that some of the sensitive visual receptors of farm and homesteads listed above who would be affected visually by the proposed Latrodex WEF are in fact located on properties involved in the already authorised Haga Haga WEF. [3] It is therefore assumed that these sensitive receptors are in fact aware of and to a certain extent accepting of the visual intrusion associated with WEF's in general as a result of their involvement with the Haga Haga WEF therefore lessening the impact on these specific identified visual receptors to **moderate**. Refer to **Map 5** to see the full extent of the farm portions involved in the authorised Haga Haga WEF.

- Visual impact is prominently **low** between 10 km and 20 km of the proposed facility. The identified sensitive visual receptors between 10km and 20km of the proposed development, as listed below, are likely to experience **moderate** visual impact, should no mitigation be undertaken. Sensitive visual receptors within this zone comprise mainly of the following users:
    - Users traveling along the R349, potential visibility is however scattered along the length of the road and visual intrusion where possible will be brief
    - Residents of the following settlements, farm or homesteads:
        - The outskirts of the coastal town of Chinsta
        - Monzi Park
        - Welland
        - Portion of Hessie Farm
        - Ncalukeni
        - Mgcogo
        - Woodbury
        - St. Anthonys
        - Soto
        - Bloemhof
        - Idlewood*
        - Blue Gums
        - Geduld
        - Manor
        - Geluk
        - Ocean View

[3] The sensitive receptors listed above marked with an Asterix have been noted as receptors involved in the authorised Haga Haga WEF.

- Essex
- Wildene
- Fort Warwick
- Langrand
- Hatchleydene*
- Idlewild*
- Gugura
- Kei Flats
- Rhodes Dale
- Cwebeni
- Dakeni
- Benmore

As noted above some of the sensitive visual receptors of farm and homesteads listed above who would be affected visually by the proposed Latrodex WEF are in fact located on properties involved in the already authorised Haga Haga WEF[4], lessening the impact likely to be experienced for these specific receptors to **low**. Refer to **Map 5** to see the full extent of the farm portions involved in the authorised Haga Haga WEF.

- Beyond the 20 km of the proposed facility, the extent of potential visual impact is somewhat reduced, and the magnitude is predominantly **very low**.

7. VISUAL IMPACT ASSESSMENT

7.1. METHODOLOGY

The previous section of the report identified specific areas where likely visual impacts would occur. This section will attempt to quantify these potential visual impacts in their respective geographical locations and in terms of the identified issues related to the visual impact.

The methodology for the assessment of potential visual impacts states the nature of the potential visual impact (e.g., the visual impact on users of major roads in the vicinity of the proposed infrastructure) and includes a table quantifying the potential visual impact according to the following criteria:

Extent - How far the visual impact is going to extend and to what extent it will have the highest impact. In the case of this type of development the extent of the visual impact is most likely to have a higher impact on receptors closer to the development and decrease as the distance increases.

- (1) Very low: International
- (2) Low: National
- (3) Medium: Regional, within the region
- (4) High: Local, within the local neighbourhoods
- (5) Very high: Site specific, within the site only

Duration - The timeframe over which the effects of the impact will be felt.

- (1) Very short: 0-1 years
- (2) Short: 2-5 years
- (3) Medium: 5-15 years
- (4) Long: >15 years
- (5) Permanent

Magnitude - The severity or size of the impact. This value is read off the Visual Impact Index maps.

- (0) None
- (2) Minor
- (4) Low
- (6) Moderate
- (8) High

[4] The sensitive receptors listed above marked with an Asterix have been noted as receptors involved in the authorised Haga Haga WEF.

- (10) Very High

Probability - The likelihood of the impact actually occurring.
- (1) Very improbable: Less than 20% sure of the likelihood of an impact occurring
- (2) Improbable: 20-40% sure of the likelihood of an impact occurring
- (3) Probable: 40-60% sure of the likelihood of an impact occurring
- (4) Highly probable: 60-80% sure of the likelihood of that impact occurring
- (5) Definite: More than 80% sure of the likelihood of that impact occurring

Significance - The significance weighting for each potential visual impact (as calculated above) is as follows:
- (0-12) Negligible:
  Where the impact would have no direct influence on the decision to develop in the area. The impact would be of a very low order. In the case of negative impacts, almost no mitigation and or remedial activity would be needed, and any minor steps, which might be needed, would be easy, cheap, and simple.
- (13-30) Low:
  Where the impact would have a very limited direct influence on the decision to develop in the area. The impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and / or remedial activity would be either easily achieved or little would be required, or both.
- (31-60) Moderate:
  Where the impact could influence the decision to develop in the area. The impact would be real but not substantial. In the case of negative impacts, mitigation and / or remedial activity would be both feasible and fairly easily possible.
- (61-80) High:
  Where the impact must have an influence on the decision to develop in the area. The impacts are of a substantial order. In the case of negative impacts, mitigation and / or remedial activity would be feasible but difficult, expensive, time-consuming or some combination of these.
- (81-100) Very High:
  Where the impact will definitely have an influence on the decision to develop in the area. The impacts are of the highest order possible. In the case of negative impacts, there would be no possible mitigation and / or remedial activity possible.

The **significance** of the potential visual impact is equal to the **consequence** multiplied by the **probability** of the impact occurring, where the consequence is determined by the sum of the individual scores for magnitude, duration and extent (i.e., **significance = consequence (magnitude + duration + extent) x probability**).

Status – The perception of Interested and Affected Parties towards the proposed development.
- Positive
- Negative
- Neutral

Reversibility – The possibility of visual recovery of the impact following the decommissioning of the proposed development
- (1) Reversible
- (3) Recoverable
- (5) Irreversible

7.2. PRIMARY IMPACTS

The primary visual impacts of the proposed Latrodex WEF are assessed as follows:

7.2.1. POTENTIAL VISUAL IMPACT OF CONSTRUCTION ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE FACILITY

During the construction period, there will be an increase in heavy vehicles utilising the roads to the construction sites that may cause, at the very least, a visual nuisance to other road users and landowners in the area in close proximity.

Within the region, dust as a result of construction activities may also be visible, as such it will result in a visual impact occurring during construction. This impact is likely to be of **moderate** significance both before and after mitigation.

Mitigation entails proper planning, management and rehabilitation of all construction sites to forego the visual impacts of the construction activities only.

Table 3: Impact table summarising the significance of visual impact of construction on visual receptors in close proximity to the proposed infrastructure

Nature of Impact: Visual impact of construction on sensitive visual receptors in close proximity to the proposed facility		
	No mitigation	***Mitigation considered***
Extent	Local **(4)**	Local **(4)**
Duration	Short term **(1)**	Short term **(1)**
Magnitude	Very High **(10)**	High **(8)**
Probability	Highly Probable **(4)**	Probable **(3)**
Significance	Moderate **(60)**	Moderate **(39)**
Status (positive or negative)	Negative	Negative
Reversibility	Reversible **(1)**	Reversible **(1)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation / Management: Construction: ➢ Ensure that vegetation is not unnecessarily removed during the construction period. ➢ Reduce the construction period through careful logistical planning and productive implementation of resources. ➢ Plan the placement of lay-down areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e., in already disturbed areas) wherever possible. ➢ Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads. ➢ Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities. ➢ Reduce and control construction dust using approved dust suppression techniques as and when required (i.e., whenever dust becomes apparent). ➢ Restrict construction activities to daylight hours whenever possible in order to reduce lighting impacts. ➢ Rehabilitate all disturbed areas immediately after the completion of construction works.		
Cumulative impacts: No cumulative impacts as a result of the construction activities are expected.		
Residual impacts: None, provided that rehabilitation works are carried out as specified.		

7.2.2. POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE PROPOSED DEVELOPMENT

The visual impacts of facility operations on sensitive visual receptors (i.e., residents of settlements, coastal towns, farm and homestead, as well as, visitors to the area) in close proximity to the proposed Latrodex WEF (i.e., within 5km) is expected to be of **very high** significance. Potential sensitive receptors are Residents of Haga Haga, Marschstrand, Kimbali Farms, Fish Bay and Haga Haga Retreat. No mitigation is possible for a facility of this scale, but measures have been included as best practice guidelines. The table below illustrates this impact assessment.

Table 4: Impact table summarising the significance of facility operations on sensitive visual receptors in close proximity (within 5km) to the proposed Latrodex WEF

Nature of Impact: Visual impact on sensitive receptors within 5km (residents of settlements, coastal towns, farm and homestead, as well as, travellers to the area), in close proximity to the proposed facility		
	No mitigation	***Mitigation considered***
Extent	Regional **(3)**	N/a
Duration	Long **(4)**	N/a
Magnitude	Very High **(10)**	N/a
Probability	Definite **(5)**	N/a
Significance	Very high **(85)**	N/a

Status (positive or negative)	Negative	N/a
Reversibility	Reversible **(1)**	N/a
Irreplaceable loss of resources?	No	N/a
Can impacts be mitigated?	No	
Mitigation / Management: Operations: ➢ Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint. ➢ Maintain the general appearance of the facility as a whole. ➢ Monitor rehabilitated areas, and implement remedial action as and when required. Decommissioning: ➢ Remove infrastructure not required for the post-decommissioning use of the site. ➢ Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications. ➢ Monitor rehabilitated areas post-decommissioning and implement remedial actions.		
Cumulative impacts: The construction of the Latrodex WEF (5 turbines) together with the authorised Haga Haga WEF (36 Turbines), is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region.		
Residual impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.		

7.2.3. POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON SENSITIVE VISUAL RECEPTORS WITHIN THE REGION

The visual impact of facility operations on sensitive visual receptors (i.e., users of the R349, residents of farm and homesteads, visitors to region, Haga Haga and Morgans Bays secondary roads) within the region (i.e., beyond the 5km offset) is expected to be of **high** significance. No mitigation is possible within this environment and for a facility of this scale, but measures have been included as best practice guidelines. The table below illustrates this impact assessment.

Table 5: Impact table summarising the significance of visual impacts of the facility operations on sensitive visual receptors within the region (beyond the 5km offset)

Nature of Impact: Visual impact on the users of the users of the arterial roads, residents of farm and homesteads, visitors to region, Haga Haga and Morgans Bays secondary roads on the periphery of the 5km offset and within the region beyond		
	No mitigation	***Mitigation considered***
Extent	Regional **(3)**	N/a
Duration	Long **(4)**	N/a
Magnitude	High **(8)**	N/a
Probability	Definite **(5)**	N/a
Significance	High **(75)**	N/a
Status (positive or negative)	Negative	N/a
Reversibility	Reversible **(1)**	N/a
Irreplaceable loss of resources?	No	N/a
Can impacts be mitigated?	No	
Mitigation / Management: Site development & Operation: ➢ Retain / re-establish and maintain large trees, natural features and noteworthy natural vegetation in all areas outside of the activity footprint. ➢ Retain natural pockets (wetland, river and other sensitive vegetation zones) as buffers within the property and along the perimeter. ➢ Dust suppression techniques should be in place at all times during the site development and operational phases. ➢ Access roads will require an effective dust suppression management programme, such as regular wetting and/or the use of non-polluting chemicals that will retain moisture in the road surface. ➢ Downscaling of operations. ➢ Keeping infrastructure at minimum heights. ➢ Introducing landscaping measures such as vegetating berms. ➢ Avoid the use of highly reflective material. ➢ Metal surfaces, where they occur, should be painted in natural soft colours that would blend in with the environment.		

➢ Maintain the general appearance of the site as a whole. Lighting ➢ Lighting should be kept to a minimum wherever possible. ➢ Install light fixtures that provide precisely directed illumination to reduce light "spillage" beyond the immediate surrounds of the activity – this is especially relevant where the edge of the activity is exposed to residential properties. ➢ Wherever possible, lights should be directed downwards to avoid illuminating the sky. ➢ Avoid high pole top security lighting along the periphery of the site and use only lights that are activated on movement. Decommissioning: ➢ Remove infrastructure not required for the post-decommissioning use of the site. ➢ Rehabilitate all areas as per the rehabilitation plan undertaken. Consult an ecologist regarding rehabilitation specifications. ➢ Monitor rehabilitated areas post-decommissioning and implement remedial actions as required.
Cumulative impacts: The construction of the Latrodex WEF (5 turbines) together with the authorised Haga Haga WEF (36 Turbines), is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region.
Residual impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.

7.2.4. POTENTIAL VISUAL IMPACT OF OPERATIONAL LIGHTING AT NIGHT ON SENSITIVE VISUAL RECEPTORS IN THE REGION

The receiving environment has a relatively small number of populated places, and it can be expected that any light trespass and glare from the security and after-hours operational lighting for the facility will have some significance. In addition, the remote sense of place and rural ambiance of the local area increases its sensitivity to such lighting intrusions.

Another source of glare light is the aircraft warning lights mounted on top of the hub of the wind turbines. While these lights are less aggravating due to the toned-down red colour, they do have the potential to be visible from a greater distance then general operational lighting, especially due to the strobing effect of the lights, a function specially designed to attract the viewers' attention. The Civil Aviation Authority (CAA) prescribes these warning lights and the potential to mitigate their visual impacts is low. The possibility of limiting aircraft warning lights to the turbines on the perimeter according to CAA requirements, thereby reducing the overall impact, is recommended to be investigated.

Figure 12: Example of aircraft warning lights fitted to the turbines as prescribed by the CAA[5]

Some ground breaking new technology in the development of strobing lights that only activate when an aircraft is detected nearby. This may aid in restricting light pollution at night and should be investigated and implemented by the project proponent, if available and permissible by the CAA. This new technology is referred to as *needs-based night lights*, which basically deactivates the wind turbine's night lights when there is no flying object within the airspace of the WEF. The system relies on the active detection of aircraft by radar sensors, which relays a switch-on signal to the central wind farm control to activate the obstacle lights.

Last is the potential lighting impact is known as sky glow. Sky glow is the condition where the night sky is illuminated when light reflects off particles in the atmosphere such as moisture, dust or smog. The sky glow intensifies with the increase in the number of light sources. Each new light source, especially upwardly directed lighting, contributes to the increase in sky glow. The general lighting of the facility may contribute to the effect of sky glow in an otherwise dark environment.

The visual impacts as a result of operational lighting at night on sensitive visual receptors in the regions is likely to be of **high** significance and may be mitigated to **moderate** should the required CAA lighting be approved to be installed on the perimeter and/or the installation of *needs-based night lights* be allowed. Best practice guidelines for other general site lighting that may occur on the site have also been taken into consideration. The table below illustrates this impact assessment.

Table 6: Impact table summarising the significance of visual impact of operational lighting at night on visual receptors in close proximity to the proposed facility

Nature of Impact: Visual impact of lighting at night on sensitive visual receptors in the region		
	No mitigation	***Mitigation considered***
Extent	Local **(3)**	Local **(3)**
Duration	Long term **(4)**	Long term **(4)**
Magnitude	High **(8)**	High **(8)**
Probability	Definite **(5)**	Probable **(3)**
Significance	High **(75)**	Moderate **(45)**
Status (positive or negative)	Negative	Negative
Reversibility	Reversible **(1)**	Reversible **(1)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: Planning & operation: ➢ Aviation standards and CAA Regulations for turbine lighting must be followed. ➢ The possibility of limiting aircraft warning lights to the turbines on the perimeter according to CAA requirements, thereby reducing the overall impact, must be investigated. ➢ Install aircraft warning lights that only activate when the presence of an aircraft is detected, if permitted by CAA. ➢ Shield the sources of light by physical barriers (walls, vegetation, or the structure itself). ➢ Limit mounting heights of lighting fixtures, or alternatively use foot-lights or bollard level lights. ➢ Make use of minimum lumen or wattage in fixtures. ➢ Make use of down-lighters, or shielded fixtures. ➢ Make use of Low-Pressure Sodium lighting or other types of low impact lighting. ➢ Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.		
Cumulative impacts: The construction of the Latrodex WEF (5 turbines) together with the authorised Haga Haga WEF (36 Turbines), is expected to contribute to the increased lighting and light pollution in an otherwise natural area increasing the cumulative visual impact of renewable energy facilities in the region.		
Residual impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.		

[5] Image Source: https://kythira-windturbines.com/en/wind-turbines-remain-visible-all-night/

7.2.5. POTENTIAL VISUAL IMPACT OF SHADOW FLICKER ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE PROPOSED DEVELOPMENT

Shadow flicker only occurs when the sky is clear, and when the turbine rotor blades are between the sun and the receptor (i.e. when the sun is low). De Gryse in Scenic Landscape Architecture (2006) found that "most shadow impact is associated with 3-4 times the height of the object". Based on this research, a 500m buffer along the edge of the outer most turbines is identified as the zone within which there is a risk of shadow flicker occurring.

Since there are no public roads or places of residence within the 500m buffer. The structures that are located immedetly adjacent to the turbines will be utalised as the workshop area for the proposed facility. The significance of shadow flicker is therefore anticipated to be **low**.

Table 7: Impact table summarising the significance of shadow flicker on sensitive receptors in close proximity to the proposed development

Nature of Impact: Visual impact of shadow flicker on sensitive receptors in close proximity to the proposed development		
	No mitigation	***Mitigation considered***
Extent	Local **(4)**	N/a
Duration	Long **(4)**	N/a
Magnitude	Low **(4)**	N/a
Probability	Improbable **(2)**	N/a
Significance	Low **(24)**	N/a
Status (positive or negative)	Negative	N/a
Reversibility	Recoverable **(3)**	N/a
Irreplaceable loss of resources?	No	N/a
Can impacts be mitigated?	No	
Mitigation / Management: Not Applicable		
Residual impacts: Not Applicable		

7.3. SECONDARY IMPACTS

7.3.1. POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON THE VISUAL CHARACTER OF THE LANDSCAPE AND SENSE OF PLACE OF THE REGION

Sense of place refers to a unique experience of an environment by a user, based on his or her cognitive experience of the place. Visual criteria and specifically the visual character of an area (informed by a combination of aspects such as topography, level of development, vegetation, noteworthy features, cultural / historical features, etc.) play a significant role.

A visual impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the environment differently, and more specifically, in a less appealing or less positive light.

In general, the landscape character of the greater study area and site itself presents as undeveloped and natural in character. The visual quality of the region is generally high and large tracts of intact vegetation characterise most of the visual environment, as well as, the scenic rugged coastline. As such, the entire study area is considered sensitive to visual impacts due to its generally low levels of transformation. The key visual experience is linked to the use of the road network and associated views of the surrounding landscape.

The anticipated visual impact on the visual character and sense of place of the study area is expected to be of **high** significance. No mitigation is possible within this environment and for a facility of this scale, but measures have been included as best practice guidelines. The table below illustrates the assessment of this anticipated impact.

Table 8: Impact table summarising the significance of visual impacts of facility operations on landscape character and sense of place within the region

Nature of Impact: Visual impact of the proposed development on the visual quality of the landscape and sense of place of the region		
	No mitigation	***Mitigation considered***
Extent	Regional **(3)**	N/a
Duration	Long **(4)**	N/a
Magnitude	High **(8)**	N/a
Probability	Definite **(5)**	N/a
Significance	High **(75)**	N/a
Status (positive or negative)	Negative	N/a
Reversibility	Reversible **(1)**	N/a
Irreplaceable loss of resources?	No	N/a
Can impacts be mitigated?	No	
Mitigation / Management: Planning: ➢ Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint. ➢ Plan ancillary infrastructure in such a way and in such a location that clearing of vegetation is minimised. ➢ Use existing roads wherever possible. Where new roads are required to be constructed, these should be planned carefully, taking due cognisance of the local topography. Roads should be laid out along the contour wherever possible, and should never traverse slopes at 90 degrees. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems. Construction: ➢ Rehabilitate all construction areas. ➢ Ensure that vegetation is not cleared unnecessarily to make way for infrastructure. Operations: ➢ Maintain the general appearance of the facility as a whole. ➢ Monitor rehabilitated areas, and implement remedial action as and when required. ➢ Decommissioning: ➢ Remove infrastructure not required for the post-decommissioning use of the site. ➢ Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications. ➢ Monitor rehabilitated areas post-decommissioning and implement remedial actions.		
Cumulative impacts: The construction of the Latrodex WEF (5 turbines) together with the authorised Haga Haga WEF (36 Turbines), is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region, especially WEF facilities visible from the coastline.		
Residual impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.		

7.3.2. POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON TOURIST ACCESS ROUTES AND TOURIST DESTINATIONS WITHIN THE REGION.

The greater region is generally seen as having a high scenic value and tourism value potential. The landscape is characterised by rugged coastlines, undulating hills with a high visual quality and strong sense of place. The R349, Haga Haga and Morgans Bay secondary roads are the primary access roads to this area and are thus considered to be a route that is likely to carry tourists.Haga Haga, Marshstrand, Morgans Bay, Double Mouth Nature Resere, and Morgans Bays Cliffs are consider the tourist destinations for the area and are where vacation accommodation is most likely to be located. While this region is general a lesser known destination, it is a popular one in the busy peak seasons as a result of its proximinity to the rugged and fairly unspoilt coast line of the Wild Coast. The Morgans Bay Cliff are a popular view point for both residents and tourists visiting the region. Located further along the coastline is also the Double Mouth Nature Reserve a lesser known hidden gem known as one of the Eastern Cape's premier coastal camping destinations nestled between Morgans Bay and the Quko River Mouth. The entrance of Double Mouth Nature Reserve also has a photo frame point which is expected to be negatively affected by the proposed Latrodex WEF.

The anticipated visual impact of the proposed Latrodex WEF on tourist access routes (i.e. the R349) and tourist destinations (i.e. accommodation and attracctions) within the region is therefore expected to be of **moderate** significance. No mitigation is possible within this environment and for a facility of this scale, but measures have been included as best practice guidelines. The table below illustrates the assessment of this anticipated impact.

Table 9: Impact table summarising the significance of visual impacts of the facility operations on tourist access routes and destinations within the region

Nature of Impact: Visual impact of the proposed development on the tourist access routes and tourist destinations within the region.		
	No mitigation	***Mitigation considered***
Extent	Regional **(3)**	N/a
Duration	Long **(4)**	N/a
Magnitude	High **(8)**	N/a
Probability	Highly Probable **(4)**	N/a
Significance	Moderate **(60)**	N/a
Status (positive or negative)	Negative	N/a
Reversibility	Reversible **(1)**	N/a
Irreplaceable loss of resources?	No	N/a
Can impacts be mitigated?	No	

Mitigation / Management:

Planning:

- Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.
- Plan ancillary infrastructure in such a way and in such a location that clearing of vegetation is minimised.
- Use existing roads wherever possible. Where new roads are required to be constructed, these should be planned carefully, taking due cognisance of the local topography. Roads should be laid out along the contour wherever possible, and should never traverse slopes at 90 degrees. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems.

Construction:

- Rehabilitate all construction areas.
- Ensure that vegetation is not cleared unnecessarily to make way for infrastructure.

Operations:

- Maintain the general appearance of the facility as a whole.
- Monitor rehabilitated areas, and implement remedial action as and when required.
- Decommissioning:
- Remove infrastructure not required for the post-decommissioning use of the site.
- Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.
- Monitor rehabilitated areas post-decommissioning and implement remedial actions.

Cumulative impacts:

The construction of the Latrodex WEF (5 turbines) together with the authorised Haga Haga WEF (36 Turbines), is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region, especially WEF facilities visible from the coastline.

Residual impacts:

The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.

7.3.3. POTENTIAL CUMULATIVE VISUAL IMPACT OF WIND ENERGY FACILITIES WITHIN THE REGION

While a large overlap between the visual exposure of the two WEF layouts (Latrodex WEF and the Haga Haga WEF) is noted, a large portion of this overlap will be taking place within the property boundaries of the authorised Haga Haga WEF. It is therefore expected that these landowners and sensitive receptors will already be accepting of the visual intrusion of WEFs in general.

A relatively small additional area of exposure previously not expected to be impacted on visually by the authorised Haga Haga WEF as a result of the five (5) additional turbines proposed was also noted. This additional area of exposure is mainly limited to the site itself, Marshstand and the high lying areas to the south west of the site between the site and Mtwentwe. In relation to the already large visually exposed area of the Haga Haga WEF and since the Latrodex WEF only consists of five (5) additional wind turbines, generally considered to be a small WEF in international and local standards, it is not expected that the addition of the Latrodex WEF will contribute in a significant way to the cumulative visual exposure of WEFs in the region. It is however expected that the proposed Latrodex WEF will contribute to the increase of WEF facilities visible from the coastline.

The table below illustrates the assessment of the anticipated cumulative visual impact of infrastructure on sensitive visual receptors within the region. Visual impacts are likely to be of **moderately low** significance.

Table 10: Impact table summarising the significance of the cumulative visual impact of the proposed Latrodex WEF together with the authorised Haga Haga WEF on sensitive visual receptors within the region

Nature of Impact: The potential cumulative visual impact of the proposed Latrodex WEF together with the authorised Haga Haga WEF on sensitive visual receptors within the region		
	Expected visual impacts of the authorised Haga Haga WEF when considered in isolation	***Cumulative visual impact with the addition of the Latrodex WEF to the Haga Haga WEF***
Extent	Regional **(3)**	Regional **(3)**
Duration	Long **(4)**	Long **(4)**
Magnitude	High **(8)**	Low **(4)**
Probability	Highly Probable **(4)**	Probable **(3)**
Significance	Moderate **(60)**	Moderate **(33)**
Status (positive or negative)	Negative	Negative
Reversibility	Reversible **(1)**	Reversible **(1)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No	
Mitigation / Management: Not Applicable		
Residual impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.		

7.4. THE POTENTIAL TO MITIGATE VISUAL IMPACTS

The primary visual impact, namely the appearance of the Wind Energy Facility (the wind turbines) is not possible to mitigate. The functional design of the turbines cannot be changed in order to reduce visual impacts.

Alternative colour schemes (i.e., painting the turbines sky-blue, grey or darker shades of white) are not permissible as the CAA's *Marking of Obstacles* expressly states, "*Wind turbines shall be painted bright white to provide the maximum daytime conspicuousness*". Failure to adhere to the prescribed colour specifications will result in the fitting of supplementary daytime lighting to the wind turbines, once again aggravating the visual impact.

The overall potential for mitigation is therefore generally low or non-existent. The following mitigations are however possible:

- Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.
- Plan ancillary infrastructure (i.e., substation and workshop) in such a way and in such a location that clearing of vegetation is minimised. Consolidate existing infrastructure as much as possible, and make use of already disturbed areas rather than pristine sites wherever possible.
- Use existing roads wherever possible. Where new roads are required to be constructed, these should be planned carefully, taking due cognisance of the local topography. Roads should be laid out along the contour wherever possible, and should never traverse slopes at 90 degrees. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems.
- Access roads, which are not required post-construction, should be ripped and rehabilitated.
- No mitigation is possible for visual impacts associated with the on-site monitoring and telecommunications masts.
- The Civil Aviation Authority (CAA) prescribes that aircraft warning lights be mounted on the turbines. However, it is possible to obtain permission to mount these lights on the turbines representing the outer perimeter of the facility. In this manner, fewer warning lights can be utilised to delineate the facility as one large obstruction, thereby lessening the potential visual impact. It is therefore recommended that the possibility of this be investigated.
- Install aircraft warning lights that only activate when the presence of an aircraft is detected, if permitted by CAA.

- Mitigation of visual impacts associated with the construction phase, albeit temporary, entails proper planning, management and rehabilitation of all construction sites. Construction should be managed according to the following principles:

    - Ensure that vegetation is not unnecessarily cleared or removed during the construction period.

- Reduce the construction period through careful logistical planning and productive implementation of resources.
- Plan the placement of lay-down areas and any potential temporary construction camps along the corridor in order to minimise vegetation clearing.
- Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.
- Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.
- Reduce and control construction dust through the use of approved dust suppression techniques as and when required (i.e., whenever dust becomes apparent).
- Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.
- Ensure that all infrastructure and the site and general surrounds are maintained and kept neat.
- Rehabilitate all disturbed areas, construction areas, roads, slopes etc. immediately after the completion of construction works. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications.
- Monitor all rehabilitated areas for at least a year for rehabilitation failure and implement remedial action as required. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications.

- Mitigation of other lighting impacts includes the pro-active design, planning and specification lighting for the facility. The correct specification and placement of lighting and light fixtures will go far to contain rather than spread the light. Additional measures include the following:

  - Shielding the sources of light by physical barriers (walls, vegetation, or the structure itself);
  - Limiting mounting heights of lighting fixtures, or alternatively using foot-lights or bollard level lights;
  - Making use of minimum lumen or wattage in fixtures;
  - Making use of down-lighters, or shielded fixtures;
  - Making use of Low-Pressure Sodium lighting or other types of low impact lighting.
  - Making use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.

- During Operations, monitor the general appearance of the facility as a whole, as well as, all rehabilitated areas.
  - The maintenance of the turbines and ancillary structures and infrastructure will ensure that the facility does not degrade, thus aggravating visual impact. Implement remedial action where required.
  - Where sensitive visual receptors are likely to affected, it is recommended that the developer enter into negotiations regarding the potential screening of visual impacts at the receptor site. This may entail the planting of vegetation, trees or even the construction of screens. Ultimately, visual screening is most effective when placed at the receptor itself.
  - Roads must be maintained to forego erosion and to suppress dust, and rehabilitated areas must be monitored for rehabilitation failure. Remedial actions must be implemented as a when required.

- After decommissioning, all infrastructure should be removed and all disturbed areas appropriately rehabilitated. Monitor rehabilitated areas post-decommissioning and implement remedial actions and consult an ecologist regarding rehabilitation specifications if necessary.

The possible mitigation of both primary and secondary visual impacts as listed above should be implemented and maintained on an on-going basis.

8. PHOTO SIMULATIONS

Photo simulations were undertaken (in addition to the above spatial analyses) in order to illustrate the potential visual impact of the proposed Latrodex WEF within the receiving environment. The purpose of the photo simulation exercise is to support the findings of the VIA, and is not an exercise to illustrate what the facility will look like from all directions.

The photo simulations indicate the anticipated visual alteration of the landscape from various points located at different distances from the infrastructure. These points coincide with specific sensitive visual receptors noted during the site visit. The simulations are based on the WTG's actual dimensions and layout.

The photograph positions and orientations are indicated on **Map 7** provided and should be referenced with the photo simulation being viewed in order to place the observer in spatial context.

It is assumed that the necessary post-construction phase rehabilitation and mitigation measures, as proposed by the various specialists in the environmental impact assessment report, have been undertaken. These photographs can therefore be seen as an ideal operational scenario (from a visual impact point of view) that should be aspired to. It is, however, crucial that the natural vegetation be restored to its present status in order for these simulations to be as realistic as possible. Additional infrastructure (e.g., access roads, substations, etc.) associated with the facility are not included in the photo simulations.

Each photographic simulation, as seen below, is preceded by a panoramic overview of the landscape (as it is presently), ultimately presenting a 'before' and 'after' scenario from the specified viewpoint being discussed. The simulated Latrodex WEF, as shown on the photographs, was adapted to the atmospheric conditions present when the original photographs were taken. This implies that factors such as haze and solar glare were also simulated in order to realistically represent the observer's potential view of the infrastructure.

Map 7: Photo simulation photograph positions and orientations

8.1. PHOTO SIMULATION POINT 1 – HAGA HAGA BEACH OUTLOOK

Photo Simulation 1 has been generated from a viewpoint situated in Haga Haga overlooking the beach towards the proposed WEF, looking to the north east. The point from which the photo was taken is approximately 2.5km from the facility and is indicative of a close-range view that locals and tourists of Haga Haga beach might experience.

Figure 13 Photo simulation viewpoint 1 before construction

Figure 14 Photo simulation viewpoint 1 after construction – 5 turbines visible from this location

8.2. PHOTO SIMULATION POINT 2 – WILD COAST ABALONE TURN OFF OF THE HAGA HAGA ROAD

Photo Simulation 2 has been generated from a viewpoint situated at the turn off to WCA from the Haga Haga Road, north west of the proposed Latrodex WEF, looking north east towards the coast and site. **This photo simulation also shows the cumulative view of the proposed Latrodex WEF together with authorised Haga Haga WEF turbines in the view.** The point from which the photo was taken is approximately 10km from the facility and is indicative of a medium range view that locals and tourists using the access road to Wild Coast Abalone and the Haga Haga Road will experience.

Figure 15 Photo simulation viewpoint 2 before construction

Figure 16 Photo simulation viewpoint 2 after construction –1 turbine visible from this location (proposed visible turbine indicated in the red square)

Figure 17 Photo simulation viewpoint 2 cumulative impact after construction of the proposed Latrodex WEF and authorised Haga Haga WEF (as seen in the foreground)

8.3. PHOTO SIMULATION POINT 3 – HAGA HAGA RETREAT

Photo Simulation 3 has been generated from a viewpoint situated at Haga Haga Retreat, south of the WEF, looking to the north east. The point from which the photo was taken is approximately 2km from the facility and is indicative of a short-range view that residents of Haga Haga Retreat will experience on a daily basis.

Figure 18 Photo simulation viewpoint 3 before construction

Figure 19 Photo simulation viewpoint 3 after construction – 5 turbines visible from this location

8.4. PHOTO SIMULATION POINT 4 – MARSHSTRAND

Photo Simulation 4 has been generated from a viewpoint situated in Marshstarnd, looking to the north. The point from which the photo was taken is approximately 1.5km from the facility.

Figure 20 Photo simulation viewpoint 4 before construction

Figure 21 Photo simulation viewpoint 4 after construction – 4 turbines visible from this location

8.5. PHOTO SIMULATION POINT 5 – MORGANS BAY CLIFFS

Photo Simulation 5 has been generated from a viewpoint situated north east of Latrodex WEF, looking to the south west. The point from which the photo was taken is approximately 6km along the coastline from the facility. This viewpoint is from the popular viewpoint located at the Morgans Bay Cliffs, visited by tourists and residents of the area frequently.

Figure 22 Photo simulation viewpoint 5 before construction

Figure 23 Photo simulation viewpoint 5 after construction – 5 turbines visible from this location

8.6. PHOTO SIMULATION POINT 5 – DOUBLE MOUTH NATURE RESERVE

Photo Simulation 5 has been generated from a viewpoint situated at the entrance of the Double Mouth Nature Reserve north east of Latrodex WEF, looking to the south west. The point from which the photo was taken is approximately 15km from the facility and is indicative of the visual impact the Latrodex WEF will have on a key tourist location in the region. This particular point was chosen due to the existence of the photo frame.

Figure 24 Photo simulation viewpoint 6 before construction

Figure 25 Photo simulation viewpoint 6 after construction - 3 turbines visible from this location

9. SUMMARY OF VISUAL IMPACTS ASSESSED

In light of the results and findings of the Visual Impact Assessment undertaken for the Latrodex WEF proposed, it is acknowledged that the receiving environment will be significantly visually transformed for the entire operational lifespan of the facility.

The following is a summary of the impacts assessed:

- The potential visual impact of construction on sensitive visual receptors in close proximity to the facility is likely to be of **moderate** significance before and after mitigation**.**
- The potential visual impact of facility operations on sensitive visual receptors within 5km (residents of settlements, coastal towns, farm and homestead, as well as, travellers to the area), in close proximity to the proposed facility is likely to be of **very high** significance. No mitigation is possible for a facility of this scale.
- The possible visual impact of facility operations on the users of the arterial roads, residents of farm and homesteads, visitors to region, Haga Haga and Morgans Bays secondary roads on the periphery of the 5km offset and within the region beyond is likely to be of **high** significance. No mitigation is possible within this environment and for a facility of this scale.
- The anticipated visual impact of operational lighting at night on sensitive visual receptors within the study area is likely to be of **high** significance and may be mitigated to **moderate** should the possible best practice mitigation measures be implemented and approval for changes to the CAA lighting is approved.
- The expected visual impact of shadow flicker on sensitive receptors in close proximity to the proposed development is likely to be of **low** significance.
- The potential visual impact of the proposed facility operations on the visual quality of the landscape and sense of place of the region is likely to be of **high** significance. No mitigation is possible for a facility of this scale.
- The anticipated visual impact of facility operations on tourist access routes and tourist destinations within the region is likely to be of **moderate** significance. No mitigation is possible for a facility of this scale.
- The potential cumulative visual impact of the proposed Latrodex WEF in addition to the authorised Haga Haga WEF on sensitive visual receptors within the region is likely to be of **moderate** significance.

10. CONCLUSION AND RECOMMENDATIONS

10.1. CONCLUSION FOR THE PROPOSED LATRODEX WEF

The visual assessment, including the photographic montages of the proposed Latrodex WEF, indicates that the construction and operation of the proposed WEF will have a very high visual effect on both the rural landscape and on sensitive receptors in the study area. The visual impact will differ amongst places, depending on the distance from the facility, but it is expected to be of the highest significance within (but not restricted to) a 5km radius of the proposed facility. Within this distance it will generally be restricted to the Haga Haga secondary road, as well as, the settlements and small coastal towns of Marshstrand, Fish Bay, Haga Haga Retreat and to a lesser extent the outskirts of Haga Haga, along the eastern seaboard. This is largely due to the relatively close distance between the observers and the wind turbines, as well as, the elevated location of the turbines. However, it is expected that since the orientation of the residential houses in these settlements and coastal towns are towards the sea itself that the visual impact likely to be experienced, where the turbines are visible, will be limited to when the residents are facing inland or travelling to or from their places of residence. Tourist travelling to these destinations, or visiting tourist facilities further inland, will also be visually impacted.

The cumulative visual impact of the addition of the proposed Latrodex WEF (5 turbines) to the already authorized Haga Haga WEF (36 turbines) in the study area is expected to slightly increase the area of potential visual impact of WEFs within the region. While a large overlap between the visual exposure of the two WEF layouts is noted, a large portion of this overlap will be taking place within the property boundaries of the authorised Haga Haga WEF. It is therefore expected that these landowners and sensitive receptors will already be accepting of the visual intrusion of WEFs in general. As a result of a relatively small additional area of exposure previously not expected to be impacted on visually by the authorised Haga Haga WEF the intensity of visual impact (additional number of turbines visible) to exposed receptors, especially those located on the site itself, Marshstand and the high lying areas to the south west of the site between the site and Mtwentwe, is expected to be greater than it would be for a single WEF. In relation to the already large visually exposed area of the Haga Haga WEF and since the Latrodex WEF only consists of five (5) additional wind turbines, generally considered to be a small WEF in international and local standards, it is not expected that the addition of the Latrodex WEF will contribute in a significant

way to the cumulative visual exposure of WEFs in the region. It is however expected that the proposed Latrodex WEF will contribute to the increase of WEF facilities visible from the coastline. Refer to Section 6.5 for more information.

Overall, the significance of the visual impacts is predominately **high,** as a result of the generally undeveloped and natural character of the landscape. A significance of **very high** is expected on sensitive receptors in close proximity (within 5km) of the proposed facility. Some impacts are expected to of moderate significance (visual impacts of construction activities, lighting at nights, tourist access routes and tourist destinations) and others low significance (shadow flicker). The facility would be visible within an area that contains certain sensitive visual receptors who would consider visual exposure to this type of infrastructure to be intrusive. Such visual receptors include people travelling along roads, residents of rural farm homesteads, residents of small coastal towns and settlements, as well as, tourists passing through or holidaying in the region.

Conventional mitigation (e.g., such as screening of the structures) of the potential visual impacts is highly unlikely to succeed due to the nature of this type of development (tip height exceeding 100m) and the receiving environment. However, a number of best practice mitigation measures have been proposed (Section 7.4) in order to limit the impacts that can be mitigated. Additionally, irrespective of whether or not mitigation measures will reduce the significance of the anticipated visual impacts, they are considered to be best practice and should all be implemented and maintained throughout the construction, operation and decommissioning phases of the proposed facility, should it be authorized. Impacts deemed possible to mitigate are general lighting of the facility and the construction activities on sensitive receptors in close proximity of the proposed facility.

In order to ensure that all the spatial analyses and mapping undertaken in this report is as accurate as possible, a transparent and scientifically defensible approach, in line with best practice methodology for this type of assessment, has been utilised. The objective of this process is to quantify the potential visual impacts associated with the proposed Latrodex WEF, using visibility analyses, proximity analyses, photo simulations and the identification of sensitive receptors. However, it must be noted that visual impact is a very subjective concept, personal to each individuals' backgrounds, opinions and perceptions. The subjects in this case are the identified sensitive receptors such as the residents of, and visitors to the region.

10.2. RECOMMENDATIONS FOR THE PROPOSED LATRODEX WEF

According to the Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning (DEA&DP) Guideline for Involving Visual and Aesthetic Specialists in the EIA Process (Oberholzer, 2005), the criteria that determine whether or not a visual impact constitutes a potential fatal flaw are categorised as follows:

1. Non-compliance with Acts, Ordinances, By-laws and adopted policies relating to visual pollution, scenic routes, special areas or proclaimed heritage sites.
2. Non-compliance with conditions of existing Records of Decision.
3. Impacts that may be evaluated to be of high significance and that are considered by the majority of the stakeholders and decision-makers to be unacceptable.

In terms of the above and to the knowledge of the author the proposed development is compliant with all Acts, Ordinances, By-laws and adopted policies relating to visual pollution, scenic routes, special areas or proclaimed heritage sites, as well as, conditions of existing Records of Decisions.

Since no reported objections from stakeholders or decision-makers within the region have been communicated by the EAP to the author of this report, this assessment has adopted a risk averse approach by assuming that the perception of most (if not all) of the sensitive visual receptors (bar the landowners of the properties earmarked for the development and in this case the landowners involved in the adjacent authorised Haga Haga WEF), would be predominantly negative towards the development of a WEF in the region. While still keeping in mind that there are also likely to be supporters of the Latrodex WEF (as renewable energy generation is a global priority) amongst the population of the larger region, but they are largely expected to be indifferent to the construction of the WEF and not as vocal in their support for the wind farm as the detractors thereof.

Therefore, with the information available to the specialist at the time of writing this report, it cannot be empirically determined that the statistical majority of objecting stakeholders were exceeded. If evidence to the contrary surfaces during the progression of the development application, the specialist reserves the right to revise the statement below.

In spite of the predominantly high residual ratings (as assessed in Section 7) and the likelihood that the proposed development will be met with concern and objections from some of the affected sensitive receptors, landowners and tour operators in the region, this report cannot categorically state that any of the above conditions were transgressed. As such these visual impacts are not considered to be fatal flaws for a development of this nature. It is, therefore, suggested that the proposed Latrodex WEF, as per the assessed layout be supported from a visual perspective, subject to the implementation of the suggested best practice mitigation measures, as provided in this report.

10.3. CONCLUSION FOR THE PROPOSED LATRODEX OHL ALTERNATIVES AND SUBSTATION

For a detailed visual impact assessment of the proposed Latrodex OHL Alternatives and substation refer to **Addendum A**.

In light of the results and findings of the Visual Impact Assessment undertaken for the proposed Latrodex Overhead Powerlines and substation, it is acknowledged that the receiving environment will be visually transformed for the entire operational lifespan of the infrastructure.

Refer to Section 12.4 in Addendum A for a detailed breakdown of the significance ratings for each alternative assessed. Overall, the significance of the visual impacts expected for each of the Alternative OHL's is as follows:

Routes to the Rivermouth Substation:

Alternative 1 (Yellow) – **Moderate (51)** significance
Alternative 2 (Blue) – **Low (26)** significance
Alternative 3 (Pink) – **Moderate (33)** significance

Routes to the Chaba Substation:

Alternative 1 (Purple) – **Moderate (42)** significance
Alternative 2 (Green) – **Moderate (40)** significance

With the exception of the OHL Alternative 2 (Blue) to Rivermouth substation, **moderate** residual significance ratings are anticipated for the rest of the OHL alternatives assessed. It is expected that the potential visual impacts associated with the proposed Latrodex OHL's and substation would be within acceptable limits and does not constitute an irreplaceable loss of visual resources. This is based on the relatively low density of sensitive visual receptors within the study area, the relatively contained extent of the infrastructure and the existing presence of power line infrastructure within the region.

Conventional mitigation (e.g., such as screening of the structures) of the potential visual impacts is highly unlikely to succeed due to the nature of this type of development and the receiving environment. However, a number of best practice mitigation measures have been proposed (Section 12.5) in order to limit the impacts that can be mitigated. Additionally, irrespective of whether or not mitigation measures will reduce the significance of the anticipated visual impacts, they are considered to be best practice and should all be implemented and maintained throughout the construction, operation and decommissioning phases of the proposed infrastructure, should it be authorized. The Impact deemed possible to mitigate is the construction activities on sensitive receptors in close proximity of the proposed OHL's.

In order to ensure that all the spatial analyses and mapping undertaken in this report is as accurate as possible, a transparent and scientifically defensible approach, in line with best practice methodology for this type of assessment, has been utilised. The objective of this process is to quantify the potential visual impacts associated with the proposed Latrodex OHL's and substation, using visibility analyses, proximity analyses, and the identification of sensitive receptors. However, it must be noted that visual impact is a very subjective concept, personal to each individuals' backgrounds, opinions and perceptions. The subjects in this case are the identified sensitive receptors such as the residents of, and visitors to the region.

10.4. RECOMMENDATIONS FOR THE PROPOSED LATRODEX OHL ALTERNATIVES AND SUBSTATION

According to the Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning (DEA&DP) Guideline for Involving Visual and Aesthetic Specialists in the EIA Process (Oberholzer, 2005), the criteria that determine whether or not a visual impact constitutes a potential fatal flaw are categorised as follows:

1. Non-compliance with Acts, Ordinances, By-laws and adopted policies relating to visual pollution, scenic routes, special areas or proclaimed heritage sites.
2. Non-compliance with conditions of existing Records of Decision.
3. Impacts that may be evaluated to be of high significance and that are considered by the majority of the stakeholders and decision-makers to be unacceptable.

In terms of the above and to the knowledge of the author the proposed development is compliant with all Acts, Ordinances, By-laws and adopted policies relating to visual pollution, scenic routes, special areas or proclaimed heritage sites, as well as, conditions of existing Records of Decisions.

With the information available to the specialist at the time of writing this report, it cannot be empirically determined that the statistical majority of objecting stakeholders were exceeded. If evidence to the contrary surfaces during the progression of the development application, the specialist reserves the right to revise the statement below.

This report cannot categorically state that any of the above conditions were transgressed. As such none of the proposed line alternatives or substation are considered to be fatally flawed in any way for a development of this nature. The following can however be recommended in terms of which alternative would be the preferred alternative for development from a visual perspective:

Routes to the Rivermouth Substation (in order of preference):

1. ***Alternative 2 (Blue) - Preferred alternative***
2. Alternative 3 (Pink)
3. Alternative 1 (Yellow) - Not recommended for development

Routes to the Chaba Substation (in order of preference:

1. ***Alternative 2 (Green) - Preferred alternative***
2. Alternative 1 (Purple)

While not fatally flawed, it is **not recommended**, from a visual perspective, that the OHL **Alternative 1 (Yellow) to Rivermouth** substation is developed as a result of it close proximity to numerous sensitive visual receptors, its proximity to the coastline, its undesirable impact on scenic resources of the area and its relatively overall moderately high significance rating (51).

No specific objections can be made regarding OHL Alternative 3 (Pink) to Rivermouth substation or OHL Alternative 1 (Purple) to Chaba substation.

Based on the above findings it is recommended that the proposed Latrodex OHL's **Alternative 2 (Blue) to Rivermouth** substation and **Alternative 2 (Green) to Chaba** substation, as per the assessed layout be **supported from a visual perspective as the preferred alternatives for development**, subject to the implementation of the suggested best practice mitigation measures, as provided in this report.

11. REFERENCES

1. Council for Scientific and Industrial Research (CSIR), 2015. *The Strategic Environmental Assessment for wind and solar photovoltaic energy in South Africa.*
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4. DEA, 2021. *South African Renewable Energy EIA Application (REEA) Database.*
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12. ADDENDUM A: VIEWSHED ANALYSIS OF THE PROPOSED LATRODEX OVERHEAD POWERLINES (OHL) AND SUBSTATION

12.1. PROJECT DESCRIPTION AND SCOPE OF WORKS

Subsequent to the writing of the Visual Impact Assessment Report for the proposed Latrodex WEF, an amendment of the scopes of works was undertaken to include the assessment of five (5) alternative overhead powerline routes and the construction of a substation at the Latrodex WEF, this includes the construction a 22kVA overhead powerline to link to two existing substations, Chaba Substation in the west and Rivermouth Substation to the north. This addendum must be read in conjunction with the Visual Impact Assessment Report for the Proposed Latrodex Wind Energy Facility, Haga Haga, Eastern Cape, South Africa.

More in-depth detail pertaining the methodology undertaken, affected environment, Visual Absorption Capacity etc. can be found in the above-mentioned report. Additionally, no specific site visit was undertaken for the assessment of these proposed routes. Base information collected from the site visit undertaken for the Latrodex WEF on the 15 September 2021 together with the desktop assessment and GIS modelling was deemed sufficient to undertake this assessment.

The five (5) alternative routes are described below consist of three (3) alternatives for the proposed line to the Rivermouth substation and two (2) alternatives for the proposed line to the Chaba substation. Refer to **Map 8**.

Routes to the Rivermouth Substation:

1. Alternative 1 - Indicated in yellow, has a line length of 8.85km. From the Latrodex WEF site, this route follows an existing powerline running parallel to the coastline, crossing over the Double Mouth Estuary before turning north-west towards the Rivermouth substation.
2. Alternative 2 - The blue route has a line length of 6.88km. From the Latrodex WEF site, this route runs in a north easterly direction towards the Rivermouth substation. This route also predominately runs along existing farm boundary lines.
3. Alternative 3 - The pink route, with a line length of 8.62km, initially follows the same route proposed for the blue route, however, shortly after crossing the Quko River it deviates to the north before turning towards the Rivermouth substation in the north east. According to the surveyor it is also apparently the most accessible route from a construction and maintenance perspective.

Routes to the Chaba Substation:

1. Alternative 1 - Dual circuit 22kV line from the Latrodex WEF site to Eskom's Chaba Substation, the route indicated in purple has a line length of 37.8km. It follows a north-westerly direction running parallel to the Haga Haga River before turning west to run along the Haga Haga road towards the R349. After crossing the R349 this line turns again towards the north passing the outskirts of the Soto settlement before running perpendicular and eventually adjacent to the road towards the Chaba substation.
2. Alternative 2 – This route is indicated in green with a line length of 38.9km. This route, from Latrodex WEF site, initially follows the purple route until it reaches the R349, from there it runs adjacent to the R349 and then tends to follow the N2 almost all the way to the Chaba substation. According to the surveyor this route has substantially more bush clearing and tree felling (large bluegum trees) required.

Refer to **Map 8**.

Anticipated issues related to the potential visual impact of the five (5) proposed OHL routes include the following:

- The visibility of the proposed infrastructure to, and potential visual impact on, users of national roads (N2), arterial roads (R349) and secondary roads (Haga Haga & George Brown Drive - Morgans Bay roads).
- The visibility of the proposed infrastructure to, and potential visual impact on residents of farmsteads and settlements.
- The visibility of the proposed infrastructure to, and potential visual impact on residents of built-up areas and populated places.

- The visibility of the proposed infrastructure to, and potential visual impact on protected areas (i.e., Double Mouth Nature Reserve).
- The potential visual impact of associated infrastructure (i.e., access roads and cleared servitudes) on sensitive visual receptors.
- Potential visual impacts associated with the construction phase on observers in close proximity to the proposed power lines.
- The potential visual impact of the proposed infrastructure on the visual quality of the landscape and sense of place of the region.
- Potential residual visual impacts after the decommissioning of the proposed power lines.
- The potential to mitigate visual impacts and inform the design process.

It is envisaged that the issues listed above may constitute a visual impact at a local and/or regional scale.

12.2. VIEWSHED ANALYSIS OF THE PROPOSED OVERHEAD POWERLINES

12.2.1. VISUAL DISTANCE AND OBSERVER PROXIMITY

For the purpose of this study, proximity offsets have been calculated from the centre line of each powerline alignment, as indicated on **Map 10** and as follows:

- 0 – 250m. Short distance view where the infrastructure would dominate the frame of vision and constitute a very high visual prominence.
- 250 - 750m. Short to medium distance view where the infrastructure would be easily and comfortably visible and constitute a high to moderate visual prominence.
- 750 - 1500m. Medium to long distance view where the infrastructure would become part of the visual environment, but would still be visible and recognisable. This zone constitutes a moderate visual prominence.
- > 1500m. Long distance view where the infrastructure may still be visible though not as easily recognisable. This zone constitutes a low visual prominence for the power line.

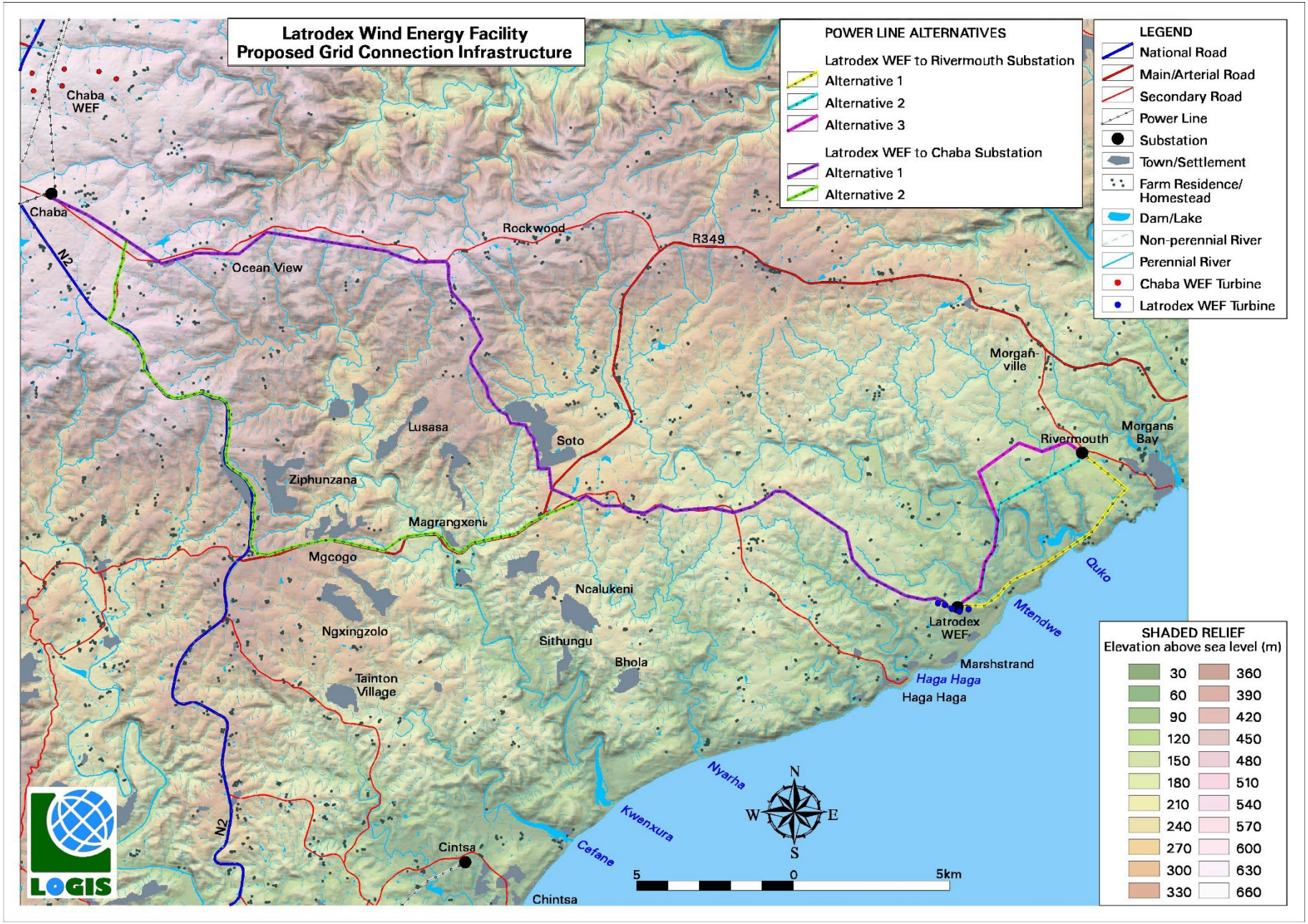
12.2.2. VIEWER INCIDENCE, PERCEPTION AND SENSITIVITY

Since the number of potential sensitive receptors and their perception of the development in question ultimately determines the concept of a visual impact (i.e., without receptors there would be no impact), the visual distance theory and the receptors proximity to the development works hand in hand, and is especially relevant, when considered from areas with a high viewer incidence and a potentially negative visual perception of the proposed overhead powerlines. It is, therefore, necessary to identify areas of high viewer incidence and to classify certain areas according to the observer's visual sensitivity towards the proposed infrastructure.

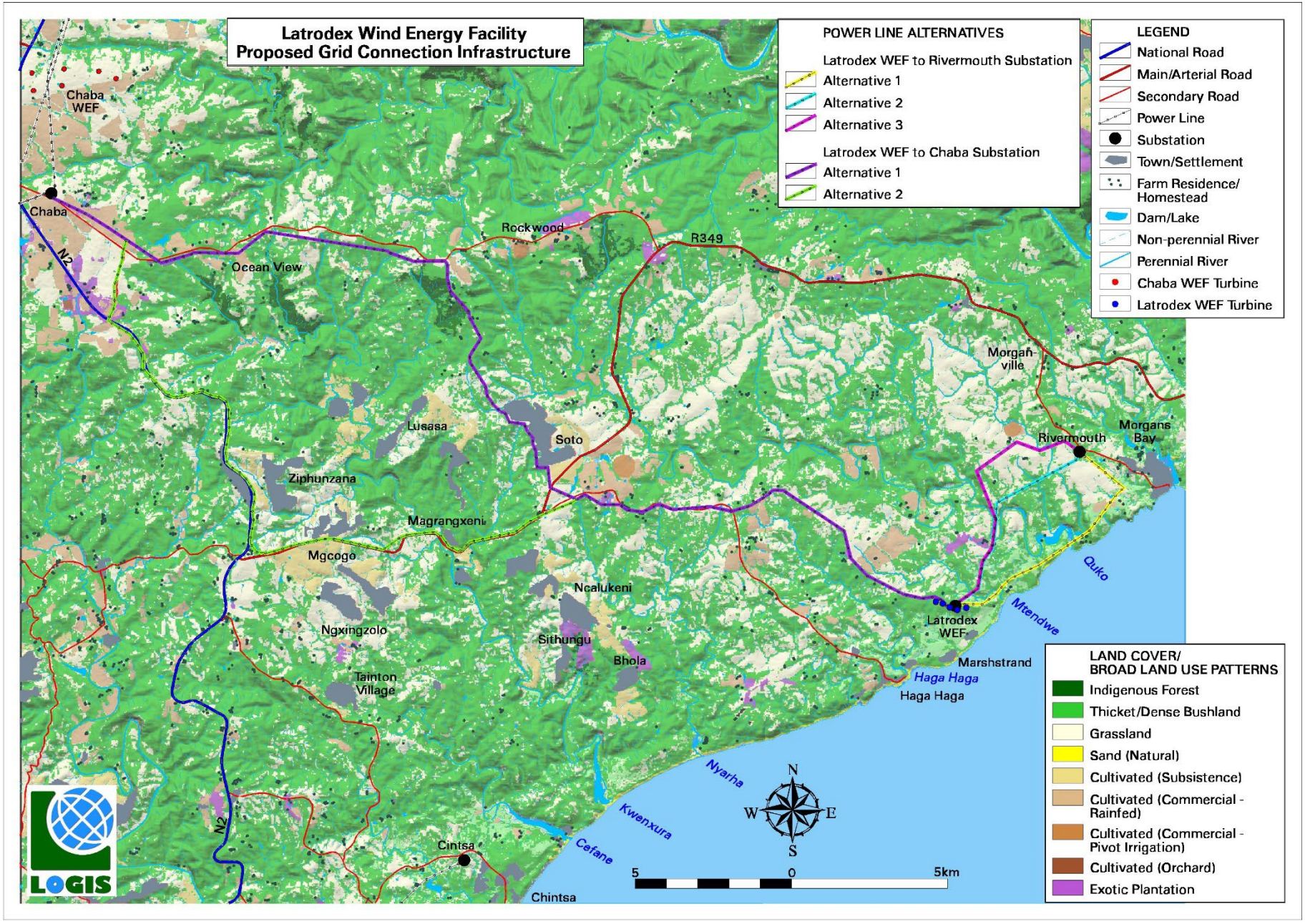
Homesteads / farmsteads, conservation and tourist areas (i.e., Double Mouth Nature Reserve, Morgans Bay Cliffs, etc.), by virtue of their visually exposed nature, are considered to be sensitive visual receptors. Viewer incidence is calculated to be the highest for the homesteads and tourism facilities within the areas closest to the powerlines, as well as, within the local built-up areas (i.e., the settlement of Marshstrand, Fish Bay, Morgans Bay, Soto, Ziphunzana, etc.). Second to these are the users along the national (N2), provincial (R349) and secondary roads within the study area (Haga Haga Road). Commuters and possible tourists using these roads may be negatively impacted upon by visual exposure to the proposed infrastructure.

Residential receptors in natural contexts are more sensitive than those in more built-up contexts, due to the absence of visual clutter in these undeveloped and undisturbed areas. Receptors within built up areas are less sensitive to potential visual impact due to the presence of structures, infrastructure and general visual clutter. Those dwelling on the periphery may be more aware of visual intrusion and may thus be considered somewhat more sensitive.

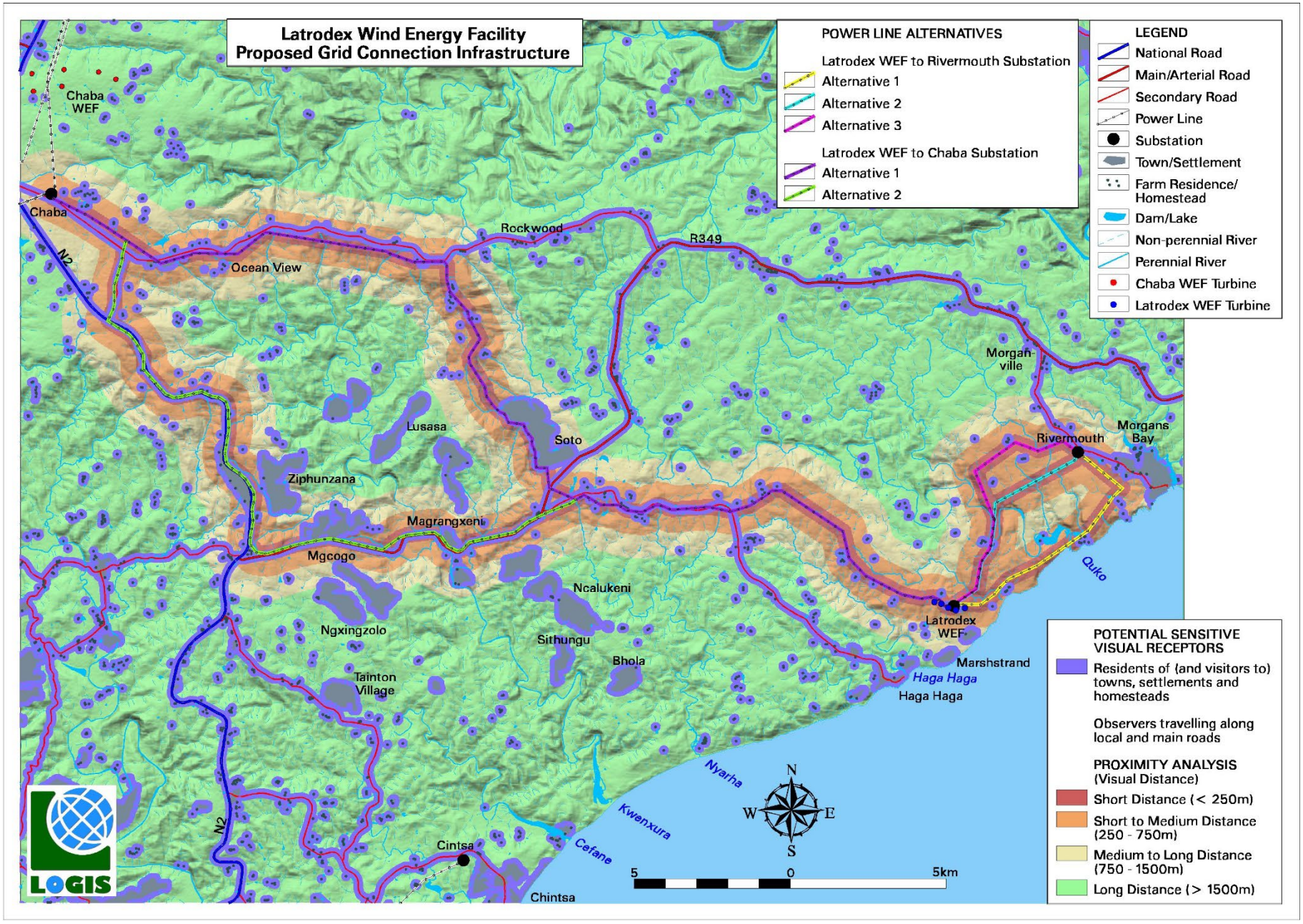
No specific report can be made on viewer perception regarding the proposed Latrodex Overhead Powerlines, as no reported stakeholder feedback has been received by the specialist. Even through overhead powerlines are already present within the landscape, considering the proximity of some of the proposed OHL routes to the coast, roads, various settlements and the undeveloped nature of the surrounding area, it is expected that any potential visual impact would be viewed in a negative light. Therefore, overall viewer perception of receptors within the study area will be assumed to be mostly negative



Map 8: Shaded relief map of the study area for the Latrodex OHL alternative routes



Map 9: Land cover / broad land use map of the study area for the Latrodex OHL alternative routes



Map 10: Visual proximity analysis, observer sensitivity and proximity of the proposed Latrodex OHL alternative routes

12.2.3. POTENTIAL VISUAL EXPOSURE

The result of the viewshed analyses for the proposed five alternative OHL routes associated with the Latrodex WEF is shown on **Map 11**. The visibility analyses for the proposed overhead powerlines were calculated from each powerline. They were calculated at an offset height of 16m above ground level (i.e., the maximum height of the power line structures of a 22kVA power line). The visibility analysis for each alignment was generated from a number of points along the alignment, spaced at intervals of approximately 400m. Receptor height was set at eye level.

The height of the substation will not exceed two storeys (i.e., 6m), therefore the visual exposure of this component will fall within the viewshed generated for the OHL's as well as the Latrodex WEF.

The analyses shows that all proposed alignments will be visually exposed to some extent within the study area, due to the tall nature of the powerline infrastructure. It is thus anticipated that all proposed alignments would be visible to observers (i.e., people travelling along roads, residing in settlement and at homesteads or visiting the region), and could potentially constitute a high visual prominence, potentially resulting in a visual impact.

The viewshed analyses do not include the effect of vegetation cover or existing structures on the exposure of the proposed facility, therefore signifying a worst-case scenario.

Map 11 indicates areas from which any of the proposed OHL routes could potentially be visible as well as proximity offsets from the proposed lines. The following is of specific relevance regarding the anticipated visual exposure of the various alignments, based on the layout illustrated on the Map provided:

Routes to the Rivermouth Substation:

Alternative 1 (Yellow)

This proposed alignment will be visually exposed to the majority of the area immediately adjacent to the infrastructure for a distance of about 1.5 km. It is also expected to have a large core area of potential visual exposure along the coastline. This includes the various portions of the Double Mouth Nature Reserve; a protected areas located along the coastline. The alignment of this line means that it will have to span across the length of the Double Mouth Estuary. Additionally, this route is in close proximity to the Morgans Bay Cliffs, a prominent tourist lookout spot in the area.

There are a number of homesteads (Fish Bay, houses near the Mtendwe river mouth, outskirts of Marshstrand) and tourist facilities (Double Mouth Camp and Caravan Site and the Morgans Bay Cliffs lookout point) located immediately adjacent to the proposed alignment. The Morgans Bay road (George Brown Drive) and outskirts of Morgans Bay itself are also expected to be visually exposed as portions are located in close proximity to the alignment as it turns towards the Rivermouth substation.

Even though this route follows an existing line route it is expected to have a very prominent visual exposure on sensitive receptors and scenic resources in the area.

Alternative 2 (Blue)

The blue route is the shortest route distance wise. This proposed alignment will be visually exposed to the majority of the area immediately adjacent to the infrastructure for a distance of about 750m. Beyond this offset, the zone of potential visual exposure becomes increasingly fragmented. This is primarily due to the nature of the undulating topography.

There is a small cluster of homesteads and farm buildings located immediately adjacent to this line where it crosses the Quko River which are expected to be visually exposed to this proposed line. This route has been aligned to follow existing farm boundaries as much as possible.

Alternative 3 (Pink)

This proposed alignment will be visually exposed to the majority of the area immediately adjacent to the infrastructure for a distance of about 750m. Beyond this offset, the zone of potential visual exposure becomes increasingly fragmented. This is primarily due to the nature of the undulating topography.

This route initially follows the same route proposed for the Alternative 2 (blue route), as such it is expected that the same small cluster of homesteads and farm buildings located immediately adjacent to this line where it crosses the Quko River are expected to be visually exposed. In addition, it is expected that several other homesteads within 750m to this line, as well as, a small portion of the Morgans Bay road (George Brown Drive) just before the Rivermouth substation, will be visually exposed.

Routes to the Chaba Substation:

Alternative 1 (Purple)

This proposed alignment will be visually exposed to the entire area immediately adjacent to the infrastructure for a distance of about 250m. Beyond this offset, the zone of potential visual exposure becomes increasingly fragmented. This is primarily due to the nature of the undulating topography.

Numerous homesteads and a settlement (Soto), within 750m of this line, are expected to be visually exposed. The Haga Haga Road, small portion of the R349 and the secondary road linking the R349 to the N2 to the Chaba substation will be visually exposed as portions are located in close proximity to the alignment.

Alternative 2 (Green)

This proposed alignment will be visually exposed to the entire area immediately adjacent to the infrastructure for a distance of about 250m. Beyond this offset, the zone of potential visual exposure becomes increasingly fragmented. This is primarily due to the nature of the undulating topography.

This route, from Latrodex WEF site, initially follows Alternative 1 (purple route) alignment until it reaches the R349, therefore, it is expected that the visual exposure will initially be the same as Alternative 1 (purple route).

Numerous homesteads and settlements located along the R 349 and N2 (Magrangxeni, Mgcogo, Ziphunzana), within 750m of this line, are expected to be visually exposed. The portion of the R349 between the Haga Haga Road and the N2, as well as, the N2 to just before the Chaba substation will be visually exposed as this line is located immediately adjacent to the alignment.

According to the surveyor this route has substantially more bush clearing and tree felling (large bluegum trees) required.

In general, despite the scattered and lower population density of the study area, each of the proposed Latrodex OHL alternative routes may constitute a moderate visual prominence, potentially resulting in a moderate visual impact.

12.2.4. VISUAL IMPACT INDEX

The combined results of visual exposure, viewer incidence / perception and visual distance of the proposed infrastructure are displayed on **Map 12**. Here the weighted impact and the likely areas of impact have been indicated as a visual impact index.

Values have been assigned for each potential visual impact per data category and merged in order to calculate the visual impact index. An area with short distance, a high viewer incidence and a predominantly negative perception would therefore have a higher value (greater impact) on the index. This helps in focussing the attention to the critical areas of potential impact when evaluating the issues related to the visual impact.

The visual impact index for the proposed infrastructure is further described as follows.

Routes to the Rivermouth Substation:

Alternative 1 (Yellow)

- The visual impact index map indicates a core area of potentially **high** visual impact within a 250m offset of the proposed infrastructure (i.e., short distance). Potential areas of **very high** visual impact within a short distance include a number of homesteads (Fish Bay, houses near the Mtendwe river mouth), portions of the coastline just before the Double Mouth Estuary, tourist facilities (Double Mouth Camp and Caravan Site) and a small portion of secondary road leading to Morgans Bay (George Brown Drive).

- The extent of visual impact is somewhat reduced within the medium distance (i.e., between the 250m and 750m offset) with small fragmented areas screened from visual impact. Potential visual impact is mostly **moderate** within this zone. Potential areas of **high** visual impact within the medium distance include a number of dwellings/homesteads, the Morgans Bay Cliffs lookout point, the outskirts of the western portion of Morgans Bay, a large portion of the coastline including the Double Mouth Nature Reserve and a portion of the secondary road leading to Morgans Bay (George Brown Drive).

- The extent of visual impact further decreases in the medium to longer distance (i.e., between the 750m and 1500m offset) with larger pockets of visually screened areas inland. Potential visual impact is mostly **low** within this zone. Potential areas of **moderate** visual impact within the medium to longer distance includes a handful of dwellings/ homesteads, WCA facility itself and the outskirts of Marschstrand.

Out of the three (3) alternative routes proposed to the Rivermouth Substation it is expected that this route (Alternative 1 – Yellow) will have the **highest visual impact** as a result of its proximity to many identified sensitive visual receptors.

Alternative 2 (Blue)

- The visual impact index map indicates a core area of potentially **high** visual impact within a 250m offset of the proposed infrastructure (i.e., short distance). Potential areas of **very high** visual impact within a short distance include a small cluster of homesteads/farm building adjacent to this line where it crosses the Quko River.

- The extent of visual impact is somewhat reduced within the medium distance (i.e., between the 250m and 750m offset). Potential visual impact is **moderate** within this zone. No known sensitive receptors are located within this zone.

- The extent of visual impact further decreases in the medium to longer distance (i.e., between the 750m and 1500m offset) with larger pockets of visually screened areas. Potential visual impact is mostly **low** within this zone. Potential areas of **moderate** visual impact within the medium to longer distance includes a handful of dwellings/ homesteads.

Out of the three (3) alternative routes proposed to the Rivermouth Substation it is expected that this route (Alternative 2 – Blue) will have the **lowest visual impact** as a result of its very limited exposure to sensitive visual receptors.

Alternative 3 (Pink)

- The visual impact index map indicates a core area of potentially **high** visual impact within a 250m offset of the proposed infrastructure (i.e., short distance). Potential areas of **very high** visual impact within a short distance include a small cluster of homesteads/farm building adjacent to this line where it crosses the Quko River, a handful of dwellings/homesteads in the north of the line, as well as, a small portion of the secondary road leading to Morgans Bay (George Brown Drive) just before the Rivermouth substation.

- The extent of visual impact is somewhat reduced within the medium distance (i.e., between the 250m and 750m offset). Potential visual impact is **moderate** within this zone. Potential areas of **high** visual impact within the medium to longer distance includes a handful of dwellings/ homesteads and a small portion of the secondary road leading to Morgans Bay (George Brown Drive) just before the Rivermouth substation.

- The extent of visual impact further decreases in the medium to longer distance (i.e., between the 750m and 1500m offset) with larger pockets of visually screened areas. Potential visual impact is mostly **low** within this zone. Potential areas of **moderate** visual impact within the medium to longer distance includes a handful of dwellings/ homesteads.

Routes to the Chaba Substation:

Alternative 1 (Purple)

- The visual impact index map indicates a core area of potentially **high** visual impact within a 250m offset of the proposed infrastructure (i.e., short distance). Potential areas of **very high** visual impact within a short distance include numerous dwellings/homesteads adjacent to this line, the outskirts of a Settlement (Soto), a small portion of the regional road (R349) and portions of various secondary roads (Haga Haga Road and the road linking the R349 to the N2 to the Chaba substation).

- The extent of visual impact is somewhat reduced within the medium distance (i.e., between the 250m and 750m offset) with small fragmented areas screened from visual impact. Potential visual impact is **moderate** within this zone. Potential areas of **high** visual impact within the medium to longer distance are the same as listed above for the short distance.

- The extent of visual impact further decreases in the medium to longer distance (i.e., between the 750m and 1500m offset) with larger pockets of visually screened areas. Potential visual impact is mostly **low** within this zone. Potential areas of **moderate** visual impact within the medium to longer distance includes numerous dwellings/ homesteads and the outskirts of Marshstrand.

Alternative 2 (Green)

- The visual impact index map indicates a core area of potentially **high** visual impact within a 250m offset of the proposed infrastructure (i.e., short distance). Potential areas of **very high** visual impact within a short distance will initially be the same as Alternative 1 (Purple route) as they follow the same alignment until the R349. Additional potential areas of very high visual impact in this zone will include various settlements located along the R349 and N2 (Magrangxeni, Mgcogo, Ziphunzana), as well as, the R349 and the N2.

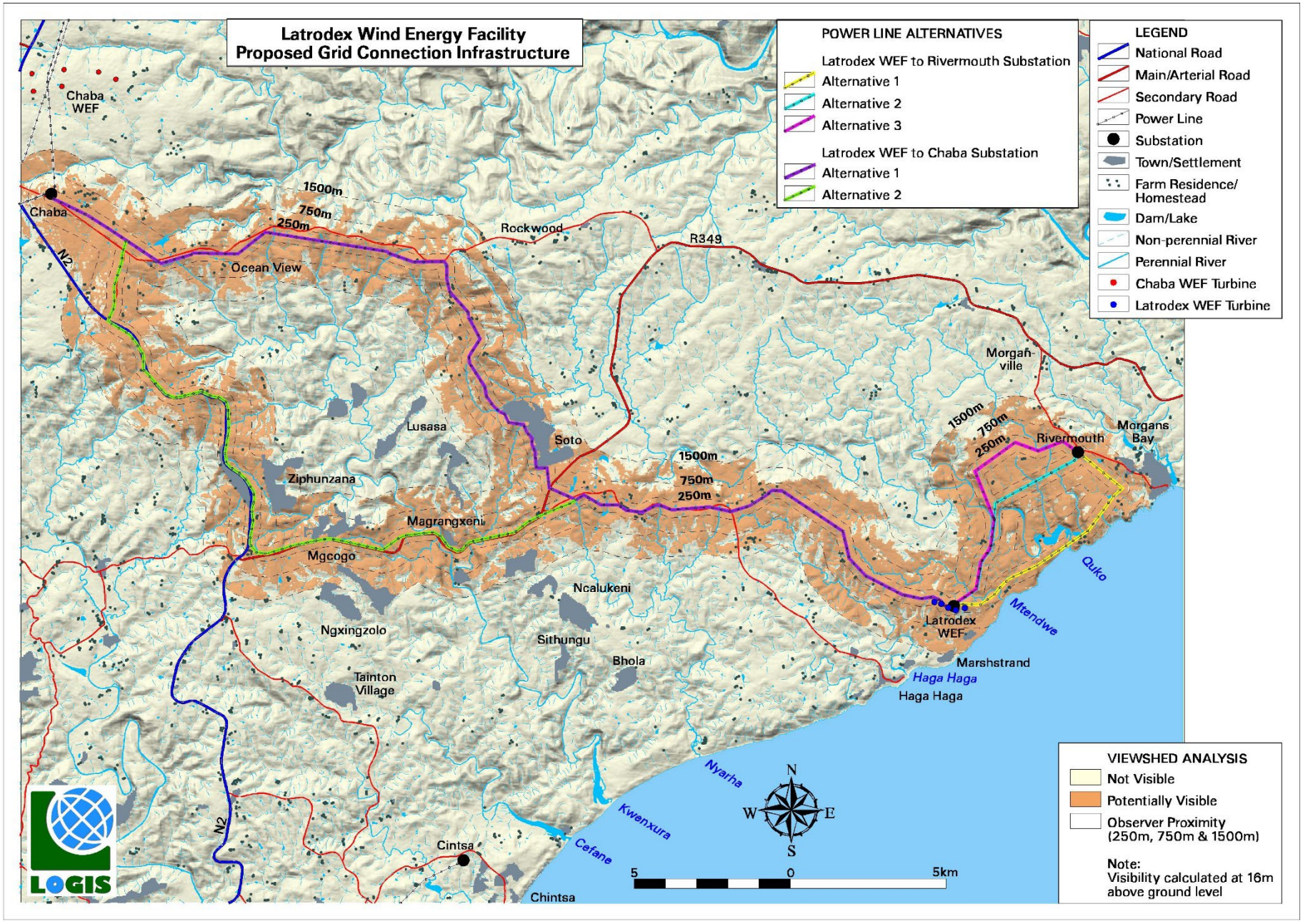
- The extent of visual impact is somewhat reduced within the medium distance (i.e., between the 250m and 750m offset). Potential visual impact is predominately **moderate** within this zone. Potential areas of **high** visual impact within the medium to longer distance includes numerous dwellings/homesteads and various settlements located along the R349 and N2 (Magrangxeni, Mgcogo, Ziphunzana).

- The extent of visual impact further decreases in the medium to longer distance (i.e., between the 750m and 1500m offset) with larger pockets of visually screened areas. Potential visual impact is mostly **low** within this zone. Potential areas of **moderate** visual impact within the medium to longer distance includes are the same as listed above for the medium distance.

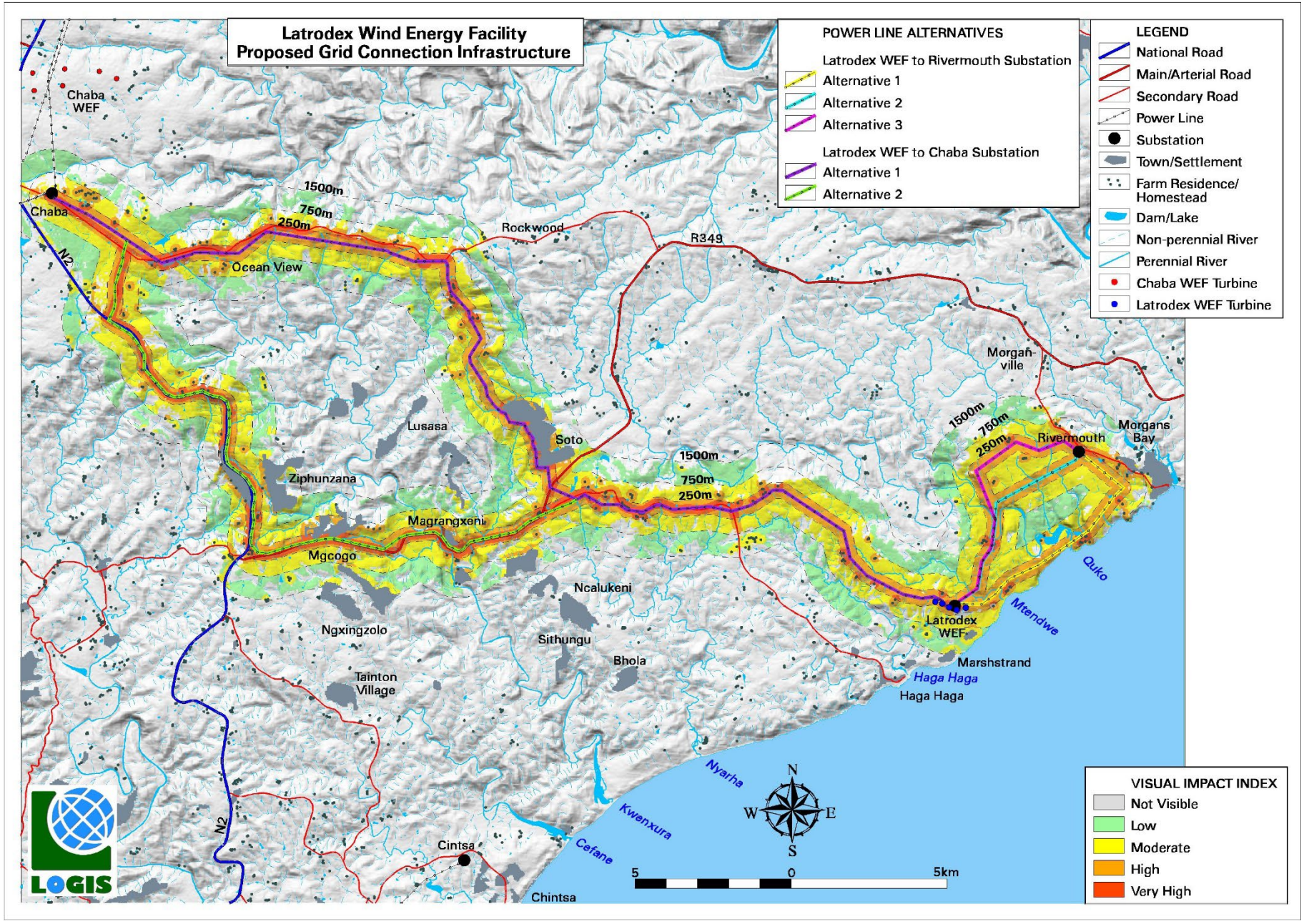
In general, these two (2) alternative routes are expected to have very similar visual impacts. Alternative 1 (Purple) has a lower density of sensitive receptors along its alignment, however, it is expected that due to its more rural location away from settlements and national/regional roads, that these sensitive receptors will be more sensitive to the visual intrusion as opposed to a receptor who lives in a built-up area with a lot more visual clutter. Conversely, Alternative 2 (Green) has a higher density of sensitive receptors along its alignment, however, it is expected that due to its alignment along national/provincial roads and within various settlements these sensitive receptors will be more accustomed to this kind of visual intrusion and already experiences a certain level of visual clutter.

12.3. VISUAL IMPACT ASSESSMENT

For a detailed methodology break down of how the visual impact assessment was undertaken refer to Section 7.1 in the Visual Impact Assessment Report for the Proposed Latrodex Wind Energy Facility, Haga Haga, Eastern Cape, South Africa.



Map 11: Potential visual exposure (viewshed analysis) of the proposed Latrodex OHL alternative routes



Map 12: Visibility Index illustrating the frequency of exposure of the proposed Latrodex OHL alternative routes

12.3.1. PRIMARY IMPACTS

12.3.1.1. POTENTIAL VISUAL IMPACT OF THE OHL'S ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE PROPOSED INFRASTRUCTURE

The visual impacts on sensitive visual receptors (i.e., residents of homesteads, tourist facilities, protected areas and users of roads) in close proximity to the proposed infrastructure (i.e., within 250m) is expected to be as follows:

Rivermouth Routes: Alternative 1 - **high** significance, Alternative 2 - **moderate** significance and Alternative 3 – **moderate** significance
Chaba Routes: Alternative 1 – **high** significance and Alternative 2 - **high** significance

Note: The number and type of sensitive receptors exposed to a visual impact influences the probability rating for each of the proposed lines.

No mitigation is possible for this type of infrastructure, but measures have been included as best practice guidelines. The table below illustrates this impact assessment.

Table 11: Impact table summarising the significance of sensitive visual receptors in close proximity to the proposed power lines

Nature of Impact: Potential visual impact on sensitive visual receptors in close proximity to the proposed infrastructure										
	ROUTES TO RIVERMOUTH SUBSTATION						**ROUTES TO CHABA SUBSTATION**			
	ALTERNATIVE 1 (YELLOW)		**ALTERNATIVE 2 (BLUE)**		**ALTERNATIVE 3 (PINK)**		**ALTERNATIVE 1 (PURPLE)**		**ALTERNATIVE 2 (GREEN)**	
	No mitigation	**Mitigation considered**	**No mitigation**	**Mitigation considered**	**No mitigation**	**Mitigation considered**	**No mitigation**	**Mitigation considered**	**No mitigation**	**Mitigation considered**
Extent	Local (4)	N/A	Local (4)	N/A	Local (4)	N/A	Local (4)	N/A	Local (4)	N/A
Duration	Permanent (5)	N/A	Permanent (5)	N/A	Permanent (5)	N/A	Permanent (5)	N/A	Permanent (5)	N/A
Magnitude	V High (10)	N/A	V High (10)	N/A	V High (10)	N/A	V High (10)	N/A	V High (10)	N/A
Probability	H Probable (4)	N/A	Improbable (2)	N/A	Probable (3)	N/A	H Probable (4)	N/A	H Probable (4)	N/A
Significance	***High (76)***	N/A	***Moderate (38)***	N/A	***Moderate (57)***	N/A	***High (76)***	N/A	***High (76)***	N/A
Status (positive/negative)	Negative	N/A	Negative	N/A	Negative	N/A	Negative	N/A	Negative	N/A
Reversibility	Recoverable (3)	N/A	Recoverable (3)	N/A	Recoverable (3)	N/A	Recoverable (3)	N/A	Recoverable (3)	N/A
Irreplaceable loss of resources	No		No		No		No		No	
Can impacts be mitigated?	No		No		No		No		No	
Mitigation: None.										
Cumulative impacts: The construction of the infrastructure will increase the cumulative visual impact of electrical type infrastructure within the region.										
Residual impacts: None. The visual impact of the power line and substation will be removed after decommissioning. If the substation and lines are not decommissioned and removed, then the impact will persist.										

12.3.1.2. POTENTIAL VISUAL IMPACT OF THE OHL'S ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE PROPOSED INFRASTRUCTURE

The visual impact on sensitive visual receptors (i.e., residents of homesteads, settlements and users of roads.) within the region (i.e., beyond the 250m offset) is expected to be as follows:

Rivermouth Routes: Alternative 1 - **high** significance, Alternative 2 - **low** significance and Alternative 3 – **moderate** significance
Chaba Routes: Alternative 1 – **moderate** significance and Alternative 2 - **moderate** significance

No mitigation is possible within this environment and for infrastructure of this scale, but measures have been included as best practice guidelines. The table below illustrates this impact assessment.

Table 12: Impact table summarising the significance of visual impacts of the OHL's on sensitive visual receptors within the region

Nature of Impact: Potential visual impact on sensitive visual receptors within the region										
	ROUTES TO RIVERMOUTH SUBSTATION						**ROUTES TO CHABA SUBSTATION**			
	ALTERNATIVE 1 (YELLOW)		**ALTERNATIVE 2 (BLUE)**		**ALTERNATIVE 3 (PINK)**		**ALTERNATIVE 1 (PURPLE)**		**ALTERNATIVE 2 (GREEN)**	
	No mitigation	**Mitigation considered**	**No mitigation**	**Mitigation considered**	**No mitigation**	**Mitigation considered**	**No mitigation**	**Mitigation considered**	**No mitigation**	**Mitigation considered**
Extent	Regional (3)	N/A	Regional (3)	N/A	Regional (3)	N/A	Regional (3)	N/A	Regional (3)	N/A
Duration	Permanent (5)	N/A	Permanent (5)	N/A	Permanent (5)	N/A	Permanent (5)	N/A	Permanent (5)	N/A
Magnitude	High (8)	N/A	High (8)	N/A	High (8)	N/A	High (8)	N/A	High (8)	N/A
Probability	H Probable (4)	N/A	V Improbable (1)	N/A	Improbable (2)	N/A	Probable (3)	N/A	Probable (3)	N/A
Significance	***High (64)***	N/A	***Low (16)***	N/A	***Moderate (32)***	N/A	***Moderate (48)***	N/A	***Moderate (48)***	N/A
Status (positive/negative)	Negative	N/A	Negative	N/A	Negative	N/A	Negative	N/A	Negative	N/A
Reversibility	Recoverable (3)	N/A	Recoverable (3)	N/A	Recoverable (3)	N/A	Recoverable (3)	N/A	Recoverable (3)	N/A
Irreplaceable loss of resources	No		No		No		No		No	
Can impacts be mitigated?	No		No		No		No		No	
Mitigation: None.										
Cumulative impacts: The construction of the infrastructure will increase the cumulative visual impact of electrical type infrastructure within the region.										
Residual impacts: None. The visual impact of the power line and substation will be removed after decommissioning. If the substation and lines are not decommissioned and removed, then the impact will persist.										

12.3.1.3. POTENTIAL VISUAL IMPACT OF THE OHL'S ON RESIDENTS OF BUILT-UP AREAS WITHIN THE REGION

The potential visual impact on residents of residents of built-up areas and populated places (i.e., Marshstrand, Morgans Bay, Soto, Magrangxeni, Mgcogo, Ziphunzana) within the region beyond the 250m offset is expected to be as follows:

Rivermouth Routes: Alternative 1 - **low** significance, Alternative 2 - **low** significance and Alternative 3 – **low** significance
Chaba Routes: Alternative 1 – **low** significance and Alternative 2 - **low** significance

Note: Overall, the presence of visual clutter within the urban environment reduces the probability of this impact occurring.

No mitigation is possible. The table below illustrates this impact assessment.

Table 13: Impact table summarising the significance of visual impacts of the OHL's on residents of built-up areas within the region

Nature of Impact: Potential visual impact on residents of built-up areas and populated places within the region										
	ROUTES TO RIVERMOUTH SUBSTATION						**ROUTES TO CHABA SUBSTATION**			
	ALTERNATIVE 1 (YELLOW)		**ALTERNATIVE 2 (BLUE)**		**ALTERNATIVE 3 (PINK)**		**ALTERNATIVE 1 (PURPLE)**		**ALTERNATIVE 2 (GREEN)**	
	No mitigation	**Mitigation considered**	**No mitigation**	**Mitigation considered**	**No mitigation**	**Mitigation considered**	**No mitigation**	**Mitigation considered**	**No mitigation**	**Mitigation considered**
Extent	Regional (3)	N/A	Regional (3)	N/A	Regional (3)	N/A	Regional (3)	N/A	Regional (3)	N/A
Duration	Permanent (5)	N/A	Permanent (5)	N/A	Permanent (5)	N/A	Permanent (5)	N/A	Permanent (5)	N/A
Magnitude	Low (4)	N/A	Low (4)	N/A	Low (4)	N/A	Low (4)	N/A	Low (4)	N/A
Probability	V Improbable (1)	N/A	V Improbable (1)	N/A	V Improbable (1)	N/A	V Improbable (1)	N/A	V Improbable (1)	N/A
Significance	***Low (12)***	N/A	***Low (12)***	N/A	***Low (12)***	N/A	***Low (12)***	N/A	***Low (12)***	N/A
Status (positive/negative)	Negative	N/A	Negative	N/A	Negative	N/A	Negative	N/A	Negative	N/A
Reversibility	Recoverable (3)	N/A	Recoverable (3)	N/A	Recoverable (3)	N/A	Recoverable (3)	N/A	Recoverable (3)	N/A
Irreplaceable loss of resources	No		No		No		No		No	
Can impacts be mitigated?	No		No		No		No		No	
Mitigation: None.										
Cumulative impacts: The construction of the infrastructure will increase the cumulative visual impact of electrical type infrastructure within the region.										
Residual impacts: None. The visual impact of the power line and substation will be removed after decommissioning. If the substation and lines are not decommissioned and removed, then the impact will persist.										

12.3.1.4. POTENTIAL VISUAL IMPACT OF THE OHL'S ON CONSERVATION AREAS WITHIN THE REGION

The potential visual impact on residents of residents of built-up areas and populated places (i.e., Double Mouth Nature Reserve) within the region beyond the 250m offset is expected to be as follows:

Rivermouth Routes: Alternative 1 - **high** significance, Alternative 2 - **negligible** significance and Alternative 3 – **negligible** significance
Chaba Routes: Alternative 1 – **negligible** significance and Alternative 2 - **negligible** significance

No mitigation is possible. The table below illustrates this impact assessment.

Table 14: Impact table summarising the significance of visual impacts of the OHL's on conservation areas within the region

Nature of Impact: Potential visual impact on conservation areas within the region										
	ROUTES TO RIVERMOUTH SUBSTATION						**ROUTES TO CHABA SUBSTATION**			
	ALTERNATIVE 1 (YELLOW)		**ALTERNATIVE 2 (BLUE)**		**ALTERNATIVE 3 (PINK)**		**ALTERNATIVE 1 (PURPLE)**		**ALTERNATIVE 2 (GREEN)**	
	No mitigation	**Mitigation considered**	**No mitigation**	**Mitigation considered**	**No mitigation**	**Mitigation considered**	**No mitigation**	**Mitigation considered**	**No mitigation**	**Mitigation considered**
Extent	Regional (3)	N/A	Regional (3)	N/A	Regional (3)	N/A	Regional (3)	N/A	Regional (3)	N/A
Duration	Permanent (5)	N/A	Permanent (5)	N/A	Permanent (5)	N/A	Permanent (5)	N/A	Permanent (5)	N/A
Magnitude	High (8)	N/A	None (0)	N/A	None (0)	N/A	None (0)	N/A	None (0)	N/A
Probability	H Probable (4)	N/A	V Improbable (1)	N/A	V Improbable (1)	N/A	V Improbable (1)	N/A	V Improbable (1)	N/A
Significance	***High (64)***	N/A	***Negligible (8)***	N/A	***Negligible (8)***	N/A	***Negligible (8)***	N/A	***Negligible (8)***	N/A
Status (positive/negative)	Negative	N/A	Negative	N/A	Negative	N/A	Negative	N/A	Negative	N/A
Reversibility	Recoverable (3)	N/A	Recoverable (3)	N/A	Recoverable (3)	N/A	Recoverable (3)	N/A	Recoverable (3)	N/A
Irreplaceable loss of resources	No		No		No		No		No	
Can impacts be mitigated?	No		No		No		No		No	
Mitigation: None.										
Cumulative impacts: The construction of the infrastructure will increase the cumulative visual impact of electrical type infrastructure within the region.										
Residual impacts: None. The visual impact of the power line and substation will be removed after decommissioning. If the substation and lines are not decommissioned and removed, then the impact will persist.										

12.3.1.5. POTENTIAL VISUAL IMPACT OF CONSTRUCTION ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE PROPOSED OHL's

During the construction period, there will be an increase in heavy vehicles utilising the roads to the construction sites that may cause, at the very least, a visual nuisance to other road users and landowners in the area in close proximity. Mitigation entails proper planning, management and rehabilitation of all construction sites to forego visual impacts. The table below illustrates the assessment of the anticipated visual impact of construction on sensitive visual receptors in close proximity to the proposed infrastructure. Visual impacts are likely to be as follows:

Rivermouth Routes: Alternative 1 – **moderate** significance before and after mitigation, Alternative 2 - **moderate** mitigated to **low** significance and Alternative 3 – **moderate** mitigated to **low** significance
Chaba Routes: Alternative 1 – **moderate** significance before and after mitigation and Alternative 2 - **moderate** mitigated to **low** significance

Table 15: Impact table summarising the significance of visual impact of construction on visual receptors in close proximity to the proposed OHL routes

Nature of Impact: Potential visual impact of construction on visual receptors in close proximity to the proposed infrastructure										
	ROUTES TO RIVERMOUTH SUBSTATION						**ROUTES TO CHABA SUBSTATION**			
	ALTERNATIVE 1 (YELLOW)		**ALTERNATIVE 2 (BLUE)**		**ALTERNATIVE 3 (PINK)**		**ALTERNATIVE 1 (PURPLE)**		**ALTERNATIVE 2 (GREEN)**	
	No mitigation	**Mitigation considered**	**No mitigation**	**Mitigation considered**	**No mitigation**	**Mitigation considered**	**No mitigation**	**Mitigation considered**	**No mitigation**	**Mitigation considered**
Extent	Local (4)	Local (4)	Local (4)	Local (4)	Local (4)	Local (4)	Local (4)	Local (4)	Local (4)	Local (4)
Duration	Sort term (2)	Sort term (2)	Short term (2)	Sort term (2)	Short term (2)	Sort term (2)	Short term (2)	Sort term (2)	Short term (2)	Sort term (2)
Magnitude	V High (8)	High (8)	High (8)	Moderate (6)	High (8)	Moderate (6)	High (8)	Moderate (6)	High (8)	Moderate (6)
Probability	H Probable (4)	Probable (3)	Probable (3)	Improbable (2)	Probable (3)	Improbable (2)	H Probable (4)	Probable (3)	Probable (3)	Improbable (2)
Significance	***Moderate (56)***	***Moderate (42)***	***Moderate (42)***	***Low (24)***	***Moderate (42)***	***Low (24)***	***Moderate (56)***	***Moderate (36)***	***Moderate (42)***	***Low (24)***
Status (positive/negative)	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative
Reversibility	Recoverable (3)	Recoverable (3)	Recoverable (3)	Recoverable (3)	Recoverable (3)	Recoverable (3)	Recoverable (3)	Recoverable (3)	Recoverable (3)	Recoverable (3)
Irreplaceable loss of resources	No		No		No		No		No	
Can impacts be mitigated?	Yes		Yes		Yes		Yes		Yes	
Mitigation: Construction: Proper planning, management and rehabilitation of the construction sites. • Ensure that vegetation is not unnecessarily removed during the construction period. • Reduce the construction period through careful logistical planning and productive implementation of resources. • Plan the placement of lay-down areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e., in already disturbed areas) wherever possible. • Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads. • Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities. • Reduce and control construction dust using approved dust suppression techniques as and when required (i.e., whenever dust becomes apparent). • Restrict construction activities to daylight hours whenever possible in order to reduce lighting impacts. • Rehabilitate all disturbed areas immediately after the completion of construction works.										

Residual impacts: None. The visual impact of the power line and substation will be removed after decommissioning. If the substation and lines are not decommissioned and removed, then the impact will persist.

12.3.2. SECONDARY IMPACTS

12.3.2.1. POTENTIAL VISUAL IMPACT OF THE OHL'S ON THE VISUAL CHARACTER OF THE LANDSCAPE AND SENSE OF PLACE OF THE REGION

Sense of place refers to a unique experience of an environment by a user, based on his or her cognitive experience of the place. Visual criteria and specifically the visual character of an area (informed by a combination of aspects such as topography, level of development, vegetation, noteworthy features, cultural / historical features, etc.) play a significant role. A visual impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the environment differently, and more specifically, in a less appealing or less positive light. The table below illustrates the assessment of this anticipated impact. The anticipated visual impact on the visual character and sense of place of the study area is expected to be as follows:

Rivermouth Routes: Alternative 1 - **moderate** significance, Alternative 2 - **low** significance and Alternative 3 – **moderate** significance
Chaba Routes: Alternative 1 – **high** significance and Alternative 2 - **high** significance

Note: The presence of existing electrical infrastructure within the region reduces the probability of this impact occurring. In addition, the longer the length of the powerline, the higher the probability of the impact occurring.

Table 16: Impact table summarising the significance of visual impacts of the OHL's on the landscape character and sense of place within the region

Nature of Impact: Potential visual impact on visual character and sense of place within the region										
	ROUTES TO RIVERMOUTH SUBSTATION						**ROUTES TO CHABA SUBSTATION**			
	ALTERNATIVE 1 (YELLOW)		**ALTERNATIVE 2 (BLUE)**		**ALTERNATIVE 3 (PINK)**		**ALTERNATIVE 1 (PURPLE)**		**ALTERNATIVE 2 (GREEN)**	
	No mitigation	**Mitigation considered**	**No mitigation**	**Mitigation considered**	**No mitigation**	**Mitigation considered**	**No mitigation**	**Mitigation considered**	**No mitigation**	**Mitigation considered**
Extent	Regional (3)	N/A	Regional (3)	N/A	Regional (3)	N/A	Regional (3)	N/A	Regional (3)	N/A
Duration	Permanent (5)	N/A	Permanent (5)	N/A	Permanent (5)	N/A	Permanent (5)	N/A	Permanent (5)	N/A
Magnitude	High (8)	N/A	Moderate (6)	N/A	Moderate (6)	N/A	Moderate (6)	N/A	Moderate (6)	N/A
Probability	Probable (3)	N/A	Improbable (2)	N/A	Probable (3)	N/A	H Probable (4)	N/A	H Probable (4)	N/A
Significance	***Moderate (48)***	N/A	***Low (28)***	N/A	***Moderate (42)***	N/A	***High (56)***	N/A	***High (56)***	N/A
Status (positive/negative)	Negative	N/A	Negative	N/A	Negative	N/A	Negative	N/A	Negative	N/A
Reversibility	Recoverable (3)	N/A	Recoverable (3)	N/A	Recoverable (3)	N/A	Recoverable (3)	N/A	Recoverable (3)	N/A
Irreplaceable loss of resources	No		No		No		No		No	
Can impacts be mitigated?	No		No		No		No		No	

Mitigation: None.
Cumulative impacts: The construction of the infrastructure will increase the cumulative visual impact of electrical type infrastructure within the region. This is specifically relevant in light of the existing power lines in the area and the Brenner Substation present in the study area.
Residual impacts: None. The visual impact of the power line and substation will be removed after decommissioning. If the substation and lines are not decommissioned and removed, then the impact will persist.

12.3.2.2. POTENTIAL CUMULATIVE VISUAL IMPACT WITHIN THE REGION

There are already existing power lines that traverse the study area and feed into both the existing Rivermouth and Chaba substations. The addition of the proposed new Latrodex substation and associated power lines will result in an increase in this type of infrastructure within the region and could result in a cumulative visual impact.

The table below illustrates the assessment of the anticipated cumulative visual impact of infrastructure on sensitive visual receptors within the region. Visual impacts are likely to be of **moderate** significance with no mitigation possible.

Table 17: Potential cumulative visual impact of the OHL's on sensitive visual receptors within the region

Nature of Impact: Potential cumulative visual impact of infrastructure on visual receptors within the region		
	All proposed alternative routes	
	No Mitigation	**Mitigation considered**
Extent	Regional (3)	N/A
Duration	Permanent (5)	N/A
Magnitude	Moderate (6)	N/A
Probability	Probable (3)	N/A
Significance	***Moderate (39)***	N/A
Status (positive/negative)	Negative	
Reversibility	Recoverable (3)	
Irreplaceable loss of resources	No	
Can impacts be mitigated?	No	
Mitigation: None.		
Residual impacts: None. The visual impact of the power line and substation will be removed after decommissioning. If the substation and lines are not decommissioned and removed, then the impact will persist.		

12.4. SUMMARY OF VISUAL IMPACTS ASSESSED

In light of the results and findings of the Visual Impact Assessment undertaken for the Latrodex substation and Overhead Powerlines proposed, it is acknowledged that the receiving environment will be visually transformed for the entire operational lifespan of the proposed infrastructure.

The following table is a summary of the impacts assessed and it also provides an overall impact significance rating for each alternative OHL based on the average total score. Based on the following formula:

Sum of the significance ratings scored in each category assessed / highest possible total * 100 = overall impact significance rating

Example of how the overall impact significance rating for each alternative OHL was determined:
*[(76 + 64 + 12 + 64 + 56 + 48 + 39) / 700] *100 = 359*
*(359 / 700) * 100 = 51.28 (overall impact significance rating)*

Table 18: Summary of the visual impacts assessed of the OHL's

IMPACTS ASSESSED	ROUTES TO RIVERMOUTH SUBSTATION						ROUTES TO CHABA SUBSTATION			
	ALTERNATIVE 1 (YELLOW)		ALTERNATIVE 2 (BLUE)		ALTERNATIVE 3 (PINK)		ALTERNATIVE 1 (PURPLE)		ALTERNATIVE 2 (GREEN)	
	No mitigation	Mitigation considered	No mitigation	Mitigation considered	No mitigation	Mitigation considered	No mitigation	Mitigation considered	No mitigation	Mitigation considered
Sensitive visual receptors in close proximity	High (76)	N/A	Moderate (38)	N/A	Moderate (57)	N/A	High (76)	N/A	High (76)	N/A
Sensitive visual receptors within the region	High (64)	N/A	Low (16)	N/A	Moderate (32)	N/A	Moderate (48)	N/A	Moderate (48)	N/A
On residents of built-up areas within the region	Low (12)	N/A	Low (12)	N/A	Low (12)	N/A	Low (12)	N/A	Low (12)	N/A
On conservation areas within the region	High (64)	N/A	Negligible (8)	N/A	Negligible (8)	N/A	Negligible (8)	N/A	Negligible (8)	N/A
Of construction on visual receptors in close proximity	Moderate (56)	Moderate (42)	Moderate (42)	Low (24)	Moderate (42)	Low (24)	Moderate (56)	Moderate (36)	Moderate (42)	Low (24)
On the landscape character and sense of place within the region	Moderate (48)	N/A	Low (28)	N/A	Moderate (42)	N/A	High (56)	N/A	High (56)	N/A
Cumulative visual impact within the region	Moderate (39)	N/A	Moderate (39)	N/A	Moderate (39)	N/A	Moderate (39)	N/A	Moderate (39)	N/A
Overall Impact Significance Rating per Alternative based on the average score	**Moderate (51)**		**Low (26)**		**Moderate (33)**		**Moderate (42)**		**Moderate (40)**	

12.5. THE POTENTIAL TO MITIGATE VISUAL IMPACTS

The primary visual impact, namely the presence of the new proposed Latrodex overhead powerlines is not possible to mitigate. The following is however recommended:

- Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.
- Plan ancillary infrastructure (i.e., substation and workshop) in such a way and in such a location that clearing of vegetation is minimised. Consolidate existing infrastructure as much as possible and make use of already disturbed areas rather than pristine sites wherever possible.
- Use existing roads wherever possible. Where new roads are required to be constructed, these should be planned carefully, taking due cognisance of the local topography. Roads should be laid out along the contour wherever possible and should never traverse slopes at 90 degrees. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems.
- Access roads, which are not required post-construction, should be ripped and rehabilitated.
- Mitigation of visual impacts associated with the construction phase, albeit temporary, entails proper planning, management and rehabilitation of all construction sites. Construction should be managed according to the following principles:

    - Ensure that vegetation is not unnecessarily cleared or removed during the construction period.
    - Reduce the construction period through careful logistical planning and productive implementation of resources.
    - Plan the placement of lay-down areas and any potential temporary construction camps along the corridor in order to minimise vegetation clearing.
    - Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.
    - Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.
    - Reduce and control construction dust through the use of approved dust suppression techniques as and when required (i.e., whenever dust becomes apparent).
    - Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.
    - Ensure that all infrastructure and the site and general surrounds are maintained and kept neat.
    - Rehabilitate all disturbed areas, construction areas, roads, slopes etc. immediately after the completion of construction works. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications.
    - Monitor all rehabilitated areas for at least a year for rehabilitation failure and implement remedial action as required. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications.

- Mitigation of other lighting impacts includes the pro-active design, planning and specification lighting for the substation. The correct specification and placement of lighting and light fixtures will go far to contain rather than spread the light. Additional measures include the following:

    - Shielding the sources of light by physical barriers (walls, vegetation, or the structure itself).
    - Limiting mounting heights of lighting fixtures, or alternatively using foot-lights or bollard level lights;
    - Making use of minimum lumen or wattage in fixtures.
    - Making use of down-lighters, or shielded fixtures.
    - Making use of Low-Pressure Sodium lighting or other types of low impact lighting.
    - Making use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.

- During Operations, monitor the general appearance of the facility as a whole as well as all rehabilitated areas. Implement remedial action where required.
- Secondary impacts anticipated as a result of the proposed infrastructure (i.e., impacts on landscape character and sense of place) are not possible to mitigate.

- After decommissioning, all infrastructure should be removed and all disturbed areas appropriately rehabilitated. Monitor rehabilitated areas post-decommissioning and implement remedial actions and consult an ecologist regarding rehabilitation specifications if necessary.

The possible mitigation of both primary and secondary visual impacts as listed above should be implemented and maintained on an on-going basis.

12.6. CONCLUSION AND RECOMMENDATIONS

In light of the results and findings of the Visual Impact Assessment undertaken for the proposed Latrodex Overhead Powerlines and substation, it is acknowledged that the receiving environment will be visually transformed for the entire operational lifespan of the infrastructure.

Refer to Section 12.4 for a detailed breakdown of the significance ratings for each alternative assessed. Overall, the significance of the visual impacts expected for each of the Alternative OHL's is as follows:

Routes to the Rivermouth Substation:

Alternative 1 (Yellow) – **Moderate (51)** significance
Alternative 2 (Blue) – **Low (26)** significance
Alternative 3 (Pink) – **Moderate (33)** significance

Routes to the Chaba Substation:

Alternative 1 (Purple) – **Moderate (42)** significance
Alternative 2 (Green) – **Moderate (40)** significance

With the exception of the OHL Alternative 2 (Blue) to Rivermouth substation, **moderate** residual significance ratings are anticipated for the rest of the OHL alternatives assessed. It is expected that the potential visual impacts associated with the proposed Latrodex OHL's and substation would be within acceptable limits and does not constitute an irreplaceable loss of visual resources. This is based on the relatively low density of sensitive visual receptors within the study area, the relatively contained extent of the infrastructure and the existing presence of power line infrastructure within the region.

Conventional mitigation (e.g., such as screening of the structures) of the potential visual impacts is highly unlikely to succeed due to the nature of this type of development and the receiving environment. However, a number of best practice mitigation measures have been proposed (Section 12.5) in order to limit the impacts that can be mitigated. Additionally, irrespective of whether or not mitigation measures will reduce the significance of the anticipated visual impacts, they are considered to be best practice and should all be implemented and maintained throughout the construction, operation and decommissioning phases of the proposed infrastructure, should it be authorized. The Impact deemed possible to mitigate is the construction activities on sensitive receptors in close proximity of the proposed OHL's.

In order to ensure that all the spatial analyses and mapping undertaken in this report is as accurate as possible, a transparent and scientifically defensible approach, in line with best practice methodology for this type of assessment, has been utilised. The objective of this process is to quantify the potential visual impacts associated with the proposed Latrodex OHL's and substation, using visibility analyses, proximity analyses, and the identification of sensitive receptors. However, it must be noted that visual impact is a very subjective concept, personal to each individuals' backgrounds, opinions and perceptions. The subjects in this case are the identified sensitive receptors such as the residents of, and visitors to the region.

According to the Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning (DEA&DP) Guideline for Involving Visual and Aesthetic Specialists in the EIA Process (Oberholzer, 2005), the criteria that determine whether or not a visual impact constitutes a potential fatal flaw are categorised as follows:

1. Non-compliance with Acts, Ordinances, By-laws and adopted policies relating to visual pollution, scenic routes, special areas or proclaimed heritage sites.
2. Non-compliance with conditions of existing Records of Decision.

3. Impacts that may be evaluated to be of high significance and that are considered by the majority of the stakeholders and decision-makers to be unacceptable.

In terms of the above and to the knowledge of the author the proposed development is compliant with all Acts, Ordinances, By-laws and adopted policies relating to visual pollution, scenic routes, special areas or proclaimed heritage sites, as well as, conditions of existing Records of Decisions.

With the information available to the specialist at the time of writing this report, it cannot be empirically determined that the statistical majority of objecting stakeholders were exceeded. If evidence to the contrary surfaces during the progression of the development application, the specialist reserves the right to revise the statement below.

This report cannot categorically state that any of the above conditions were transgressed. As such none of the proposed line alternatives or substation are considered to be fatally flawed in any way for a development of this nature. The following can however be recommended in terms of which alternative would be the preferred alternative for development from a visual perspective:

Routes to the Rivermouth Substation (in order of preference):

1. ***Alternative 2 (Blue) - Preferred alternative***
2. Alternative 3 (Pink)
3. Alternative 1 (Yellow) - Not recommended for development

Routes to the Chaba Substation (in order of preference:

1. ***Alternative 2 (Green) - Preferred alternative***
2. Alternative 1 (Purple)

While not fatally flawed, it is **not recommended**, from a visual perspective, that the OHL **Alternative 1 (Yellow) to Rivermouth** substation is developed as a result of it close proximity to numerous sensitive visual receptors, its proximity to the coastline, its undesirable impact on scenic resources of the area and its relatively overall moderately high significance rating (51).

No specific objections can be made regarding OHL Alternative 3 (Pink) to Rivermouth substation or OHL Alternative 1 (Purple) to Chaba substation.

Based on the above findings it is recommended that the proposed Latrodex OHL's **Alternative 2 (Blue) to Rivermouth** substation and **Alternative 2 (Green) to Chaba** substation, as per the assessed layout be **supported from a visual perspective as the preferred alternatives for development**, subject to the implementation of the suggested best practice mitigation measures, as provided in this report.

Province of the
EASTERN CAPE
ECONOMIC DEVELOPMENT, ENVIRONMENTAL AFFAIRS & TOURISM

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST IN TERMS OF REGULATIONS 12 AND 13 OF THE AMENDMENTS TO THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS, 2014 AS AMENDED.

	(For official use only)
File Reference Number:	
NEAS Reference Number:	
Date Received:	

Application for environmental authorization in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Amendments to the Environmental Impact Assessment Regulations, 2014. This form is valid as of 6 January 2021.

PROJECT TITLE

LATRODEX WIND ENERGY FACILITY, HAGA HAGA, EASTERN CAPE

SPECIALIST [1]	VISUAL IMPACT ASSESSMENT		
Contact person:	TOSCA GRÜNEWALD		
Postal address:	8A TREVOR STREET, MURRAYFIELD		
Postal code:	0184	Cell:	0724788856
Telephone:	—	Fax:	—
E-mail:	tosca@nuleafsa.co.za		
Professional affiliation(s) (if any)	EAPASA + SACLAP		

Project Consultant:	SAGE WANSELL - CES / NEXTEX		
Contact person:	SAGE WANSELL		
Postal address:			
		Cell:	087 549 1645
Postal code:			
Telephone:		Fax:	
E-mail:	sage.wansell@cesnet.co.za		-

4.2 The SPECIALIST

I, TOSCA GRÜNEWALD , declare that –

General declaration:

- I act as the independent Specialist in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in regulation **8** of the regulations when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by

interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;

- I will keep a register of all interested and affected parties that participated in a public participation process; and
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- all the particulars furnished by me in this form are true and correct;
- will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I realise that a false declaration is an offence and is punishable in terms of section 24F of the Act.

Disclosure of Vested Interest (delete whichever is not applicable)

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Amendments to Environmental Impact Assessment Regulations, 2014 as amended.
- I have a vested interest in the proposed activity proceeding, such vested interest being:

N/A

Signature of the environmental assessment practitioner:

NULEAF PLANNING AND ENVIRONMENTAL (PTY) LTD

Name of company:

18/07/2022

Date:

Signature of the Commissioner of Oaths:

2022-07-18

Date:

SERGEANT, SAPS

Designation:

[1] Curriculum Vitae (CV) attached

Official stamp (below).

SOUTH AFRICAN POLICE SERVICE
GARSFONTEIN
2022 -07- 18
COMMUNITY SERVICE CENTRE
SUID-AFRIKAANSE POLISIEDIENS

Annexure 1

CV

Curriculum Vitae

TOSCA DINA GRUNEWALD

PERSONAL INFORMATION

Full Name:	Tosca Dina Grünewald
Date of Birth:	1988-07-24
Gender:	Female
Nationality:	South African
Race:	White
Language(s):	English and Afrikaans (written and spoken)
Marital Status:	Single
Dependents:	0
Driver's License:	Code 08
Telephone number:	072 478 8856
Email address:	tosca@nuleafsa.co.za

FORMAL EDUCATION

Date	Qualification	Institution
2006	Grade 12	Christian Brothers College, Pretoria
2010	Baccalaureus in Landscape Architecture (BL)	University of Pretoria
2012	Baccalaureus Honorius in Landscape Architecture	University of Pretoria
2013	Masters in Landscape Architecture (ML)	University of Pretoria

MEMBERSHIPS & AFFILIATIONS

- Professional Landscape Architect: South African Council for the Landscape Architectural Profession (SACLAP). Membership No. 20421
- Registered Environmental Assessment Practitioner: Environmental Assessment Practitioners Association of South Africa (EAPASA). Registration No. 2019/1582

TECHNICAL SKILLS

Software	Skill level
MS Word	proficient
MS Excel	proficient
MS Outlook	proficient
MS PowerPoint	proficient
Corel DRAW	proficient
Adobe Photoshop, Illustrator & InDesign	proficient
AutoCAD	proficient
Google Sketchup	capable
Global Mapper GIS	proficient
Locus Maps	proficient

BRIEF SUMMARY OF CORE COMPETENCIES

Tosca has a Masters in Landscape Architecture, and 8 years of experience. Tosca has specialized in Landscape Architecture, as well as, Environmental Planning and Management, with specific expertise in Framework and Master planning, Environmental Impact Assessments and Environmental Management Planning.

CAREER HISTORY

Date	Company / Organization	Position
2014 - present	Nuleaf Planning and Environmental (Pty) Ltd	Landscape Architect / Environmental Practitioner
Jan 2014 – Aug 2014	Interdesign Landscape Architects	Candidate Landscape Architect
2010	Grow Wild Indigenous Nursery	Consultation and Sales

RELEVANT WORK EXPERIENCE (KEY PROJECTS)

(All projects in South Africa unless otherwise stated)

COMPANY	YEAR	PROJECT NAME	CLIENT	DESCRIPTION OF DUTIES
Nuleaf Planning & Environmental	2021	Engen Garage Zambezi LDP	Sinovich Group	Landscape Site Development Plans
Nuleaf Planning & Environmental	2021	Peer Review: Albany Wind Energy Facility Visual Impact Assessment Report	CES - Environmental and social advisory services	Peer Review of the Visual Impact Assessment (VIA) undertaken by CES for the Albany WEF
Nuleaf Planning & Environmental	2021	Lapalala Wilderness School & Access Road	Mapula Trust	Application for Protected Tree removal permit
Nuleaf Planning & Environmental	2020-21	Finfoot Estate BAR (EIA)	Sandton Sales (Pty)Ltd	Basic Assessment (EIA) process for expansion of the Finfoot Estate, Vallkop Damp, North-West Province.
Nuleaf Planning & Environmental	2019 - 2021	Kaba Water Use License Application	Grace Management Services	Team Leader, Project coordinator
Nuleaf Planning & Environmental	2020	KABA Proclamation Process	Grace Management Services (Pty) Ltd	Preparation and submission of application documentation for the proclamation of Kaba farm as a Protected Area in terms of the NEMA:PAA.
Nuleaf Planning & Environmental	2019 - 2021	Tuna Park development Master Plan, EIA and WULA	Silverhorns Consulting	Team Leader, Project coordinator
Nuleaf Planning & Environmental	2019	Bakubung Lifestyle Villas Compliance with Environmental Authorisation Letter	Pilanesberg Resorts (Pty) Ltd	Environmental Control Officer
Nuleaf Planning & Environmental	2019	Limpopo Nature Reserves: Mapping	Limpopo Department of Economic Development, Environment and Tourism	Development of a GIS database, mapping and production of information and map brochures for 12 provincial nature reserves.
Nuleaf Planning & Environmental	2019	City of Tshwane Landscape Specification Document	City of Tshwane	Team Leader, Project coordinator. Development of standardized landscape specifications and details for the City of Tshwane to provide Landscape Contractors
Nuleaf Planning & Environmental	2019	Rainbow Junction Mixed Use Development: Phase 1a	Rainbow Junction Development Company (Pty) Ltd	Development of landscape master plan for public and private open space components of the project.
Nuleaf Planning & Environmental	2019	Rietspruit Rehabilitation / Development Master Plan and Sketch Plan	Silverhorns Consulting	Development of a landscape master plan and sketch plan for the Rietspruit open space / wetland area, Gauteng Province.
Nuleaf Planning & Environmental	2019	Kapama Game Reserve Section 24(G) Application	Kapama Game Reserve	Visual Impact Assessment
Nuleaf Planning & Environmental	2019	Marataba Staff Accommodation & Roads ECO	Marakele Park (Pty) Ltd	Environmental Control Officer
Nuleaf Planning & Environmental	2015-2019	Various Landscape Development Plans (LDP) for group housing	Various	Landscape Site Development Plans, BoQ and preliminary costing
Nuleaf Planning & Environmental	2018	Natalspruit landscape development master plan	Silverhorns Consulting	Development of a landscape master plan for the Natalspruit open space / wetland area, Gauteng Province.
Nuleaf Planning & Environmental	2018	Jukskei Illiondale landscape development master plan	Silverhorns Consulting	Development of a landscape master plan for the Jukskei-Illiondale open space / wetland area, Gauteng Province.
Nuleaf Planning & Environmental	2018	Bakubung Reservoir Basic Assessment	Pilanesberg Resorts (Pty) Ltd	Environmental Control Officer

Nuleaf Planning & Environmental	2018 - 2019	Bakubung Villa	Pilanesberg Resorts (Pty) Ltd	Environmental Control Officer
Nuleaf Planning & Environmental	2018	Ngwenya Lodge VIA	Quality Time Marketing (Pty) Ltd	Team Leader, Project coordinator
Nuleaf Planning & Environmental	2018	Kaba Private Homes Basic Assessment		Team Leader, Project coordinator
Nuleaf Planning & Environmental	2018	Ngwenya Lodge WWTS Basic Assessment Process	Quality Time Marketing (Pty) Ltd	Project Leader
Nuleaf Planning & Environmental	2017	Kaba Private Homes Basic Assessment	Grace Management Services	Team Leader, Project coordinator
Nuleaf Planning & Environmental	2017	Bakubung Reservoir Basic Assessment	Pilanesberg Resorts (Pty) Ltd	Team Leader, Project coordinator
Nuleaf Planning & Environmental	2017	Bakubung Villa Sewage Amendment	Pilanesberg Resorts (Pty) Ltd	Team Leader, Project coordinator
Nuleaf Planning & Environmental	2017	Marataba Section of the Marakele National Park – additional game viewing roads – Basic Assessment Process	Marakele Park (Pty) Ltd	Project Leader
Nuleaf Planning & Environmental	2017	Witsieshoek Mountain Lodge - Mountain Bike Trails mapping	Witsieshoek Mountain Lodge (Pty) Ltd	Project Leader
Nuleaf Planning & Environmental	2017	SMEC Landscape	Rowbow Investments	Landscape Design
Nuleaf Planning & Environmental	2017	Sasol Filling Stations	Rainbow Junction Company (Pty) Ltd	Landscape Design
Nuleaf Planning & Environmental	2017	Lapalala Wilderness School Basic Assessment	Mapula Trust	Environmental Impact Assessment
Nuleaf Planning & Environmental	2017	Commettre Gardens	Commettre	Landscape Design
Nuleaf Planning & Environmental	2017	Maropeng Interpretation Centre	GAPP	Environmental Control Officer
Nuleaf Planning & Environmental	2016	Master Plan Framework for the Klipspruit Soweto Water Management Unit	Silverhorns Consulting	Landscape Master Plan
Nuleaf Planning & Environmental	2016	Master Plan Framework for the Rehabilitation of the Jukskei Alexandra Water management Unit	Silverhorns Consulting	Landscape Master Plan
Nuleaf Planning & Environmental	2016	Tourism Master Plan and Management Plan for Sani Top and Semonkong, Lesotho	Lesotho Tourism and Development Corporation	Tourism / Landscape Master Plan
Nuleaf Planning & Environmental	2015-2016	Various landscape SDP's for group housing	Various	Landscape Site Development Plans, BoQ and preliminary costing
Nuleaf Planning & Environmental	2015-2016	EIA for the proposed Kaalspruit Open Space Project, Tembisa, Gauteng	Silverhorns Consulting	Environmental Impact Assessment
Nuleaf Planning & Environmental	2015-2016	Master Plan Framework for the Rehabilitation of the Kaalspruit	Silverhorns Consulting	Landscape Master Plan
Nuleaf Planning & Environmental	2015	Wonderboom Junction Phase 2 Shopping Centre	Rainbow Junction Company (Pty) Ltd	Peer review of Environmental Impact Assessment Process and lodging of environmental complaint

Nuleaf Planning & Environmental	2015	AIR Resource Mapping and Management Planning	CESVI / European Commission	Resource mapping and development of management guidelines for 10 African Ivory Routes camps and Community areas in Limpopo Province.
Nuleaf Planning & Environmental	2015	Rehabilitation specification and landscape audit for Union Buildings south lawn	Red Bull	Specification and auditing
Nuleaf Planning & Environmental	2015	IMP: Greater Lakenvlei Protected Environment (GLPE).	Mpumalanga Tourism and Parks Agency	Preparation of an Integrated Management Plan, including zoning, tourism master plan and management plan, for the GLPE, Dullstroom area.
Nuleaf Planning & Environmental	2015	Buccleuch ext 9 wetland design	Seaton Thompson Consulting	Landscape design
Nuleaf Planning & Environmental	2015	South Zambezi landscape design, Samrand	Khato Civils	Landscape design
Nuleaf Planning & Environmental	2014-2015	Various landscape LDP's for group housing	Sinovich Group	Landscape Site Development Plans, BoQ and preliminary costing
Nuleaf Planning & Environmental	2014-2015	Concept Master Plan for the proposed Banghazi Lake Development	African Safari Foundation	Concept Master Plan and development vision
Nuleaf Planning & Environmental	2014-2015	EIA for the proposed expansion of the Bhundu Inn Hotel, Nkangala District	Paul Mojapelo	EIA Mapping
Nuleaf Planning & Environmental	2014-2015	EIA for a proposed spa at Bakubung Lodge, Pilanesberg Game Reserve	Pilanesberg Resorts Pty Ltd	Environmental Control Officer auditing construction
Nuleaf Planning & Environmental	2014-2015	EIA for the proposed Malelane Safari Lodge near the Malelane gate, Kruger National Park	Marakele Safari Resort Investments Pty Ltd	EIA Mapping
Nuleaf Planning & Environmental	2014-2015	EIA for proposed tourism infrastructure at Marakele Park Pty Ltd	Marakele Park Pty Ltd	Environmental Control Officer auditing construction
Nuleaf Planning & Environmental	2014-2015	EIA for proposed upgrades to the Maropeng Interpretation Centre	GAPP	EIA Mapping
Nuleaf Planning & Environmental	2014-2015	Visual Impact Assessment for the proposed upgrades to the Maropeng Interpretation Centre	GAPP	Visual Impact Assessment
Nuleaf Planning & Environmental	2014	Visual Impact Assessment for the proposed Exheredo Solar Energy Facility	Savannah Environmental	Visual Impact Assessment
Interdesign Landscape Architects	2014	Rustenburg Open Space and Heritage Management Plan (ROSHMAP)	Rustenburg Local Municipality	Open Space and Heritage Management
Interdesign Landscape Architects	2014	LDP - ASCO Warehouse and Offices, Midrand	ASCO	Landscape Site Development Plans, project management, design inputs, drafting and client liaison
Interdesign Landscape Architects	2014	LDP - Garden Antonites	Mr & Mrs Antonites	Landscape Site Development Plans, project management, design inputs, drafting and client liaison

Interdesign Landscape Architects	2014	Hazeldean Office Park Landscape Audit	Abland	As-built Landscape Plan
Interdesign Landscape Architects	2014	LDP - Rietvalleirand	Unknown	Landscape Site Development Plans, project management, design inputs, drafting and client liaison
Interdesign Landscape Architects	2014	LDP – Throntree Place	Unknown	Landscape Site Development Plans, project management, design inputs, drafting and client liaison
Interdesign Landscape Architects	2014	LDP – House Bester	Unknown	Landscape Site Development Plans, project management, design inputs, drafting and client liaison
Interdesign Landscape Architects	2014	LDP – Chueu Chambers	Unknown	Landscape Site Development Plans, project management, design inputs, drafting and client liaison
Interdesign Landscape Architects	2014	LDP – Northern Views	Unknown	Landscape Site Development Plans, project management, design inputs, drafting and client liaison
Interdesign Landscape Architects	2014	LDP – Wierdapark Erf 380	Unknown	Landscape Site Development Plans, project management, design inputs, drafting and client liaison
Interdesign Landscape Architects	2014	LDP – House Nhlapo	Unknown	Landscape Site Development Plans, project management, design inputs, drafting and client liaison
Interdesign Landscape Architects	2014	LDP – Eldoraigne x76	Unknown	Landscape Site Development Plans, project management, design inputs, drafting and client liaison
Interdesign Landscape Architects	2014	LDP – Marman Trust Garden	Unknown	Landscape Site Development Plans, project management, design inputs, drafting and client liaison