White Hill Wind Farm Electricity Substation & Electricity Line

Environmental Impact Assessment Report

Chapter 9: Landscape

White Hill Wind Limited

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Contents

9.1 Introduction

This chapter describes the landscape context of the project and assesses the likely landscape and visual impacts on the receiving environment.

Although closely linked, landscape and visual impacts are assessed separately. Landscape Impact Assessment (LIA) relates to changes in the physical landscape brought about by the project, which may alter its character and how the landscape is experienced. This requires a detailed analysis of the individual elements and characteristics of a landscape that go together to make up the overall landscape character of that area. By understanding the aspects that contribute to landscape character, it is possible to make judgements about its quality (integrity) and to identify key sensitivities. This, in turn, provides a measure of the ability of the landscape in question to accommodate the type and scale of change associated with the project without causing unacceptable adverse changes to its character.

Visual Impact Assessment (VIA) relates to assessing effects of a development on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements. Visual impacts may occur from; Visual Obstruction (blocking of a view, be it full, partial or intermittent) or; Visual Intrusion (interruption of a view without blocking).

Cumulative landscape and visual impact assessment is concerned with additional changes to the landscape or visual amenity caused by the project in conjunction with other developments (associated or separate to it), or actions that occurred in the past, present or are likely to occur in the foreseeable future.

9.1.1 Approach and Statement of Authority

This LVIA adopts an approach that is founded in the following best practice guidance documents:-

- Landscape Institute and the Institute of Environmental Management and Assessment (IEMA) *Guidelines for Landscape and Visual Impact Assessment, 2013 (GLVIA3)*;
- Environmental Protection Agency (EPA) *Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022)*; and,
- Landscape Institute Technical Guidance Note 06/2019 *Photography and Photomontage in Landscape and Visual Impact Assessment*.

This chapter was prepared by Cian Doughan (BSLA, MILI), Associate Director at Macro Works Ltd; a specialist LVIA company with over 20-years of experience in the appraisal of effects from various energy, infrastructure and commercial developments. Relevant experience extends to numerous electrical infrastructure developments, including transmission lines and substations, and the assessment of over 140 no. wind energy developments 120 no. solar energy developments. Macro Works and its senior staff are affiliated with the Irish Landscape Institute.

9.1.2 Description of the Project

The project site is located in rural County Kilkenny and County Carlow, approximately 11 kilometres (km) northeast of Kilkenny City, c. 15km southwest of Carlow Town, c. 3km west of Muine Bheag and c. 1km north of Paulstown. In summary, the project comprises the following main components as described in full at **Chapter 3**:-

- A 110kV 'loop-in/loop-out' electricity substation;
- Approximately 320 metres (m) of 110kV underground electricity line between the electricity substation and the Kellis-Kilkenny overhead transmission line and the provision of 2 no. interface masts;
- An electrical control unit at the permitted White Hill Wind Farm site;
- Approximately 8.8km of underground electricity line between the electricity substation and the electrical control unit; and,
- All associated and ancillary site development, access, excavation, construction, landscaping and reinstatement works, including provision of site drainage infrastructure.

The project site traverses the administrative boundary between counties Kilkenny and Carlow; with the electricity substation and c. 3.3km of the underground electricity line located in County Kilkenny and c. 5.5km of the underground electricity line and the electrical control unit located in County Carlow. Electrical equipment suppliers, construction material suppliers and candidate quarries which may supply aggregates are located nationwide.

9.2 Methodology

The preparation of this chapter involved desktop studies to understand the existing baseline environment; fieldwork recording the elements and characteristics of the landscape and selecting and capturing images to allow the preparation of photomontages; and the professional evaluation of the baseline environment and the effects that may occur as a result of the project with the aid of the accompanying photomontages, enclosed at **Annex 9.1**.

9.2.1 Desktop Study

The desk study involved:-

- Establishing an appropriate study area from which to study the landscape and visual impacts of the project;
- Review of a Zone of Theoretical Visibility map, which indicates areas from which the project is potentially visible given the terrain within the study area;
- Review of relevant legislation and guidance, including County Development Plans, particularly concerning sensitive landscape and scenic view/route designations; and,
- Selection of potential Viewshed Reference Points (VRPs/VPs) from key visual receptors to be investigated during fieldwork for actual visibility and sensitivity.

9.2.2 Fieldwork

The fieldwork undertaken to inform this assessment included:-

- Recording a description of the landscape elements and characteristics within the study area;
- Selection of a refined set of VRPs for assessment. This includes the capture of reference images and grid reference coordinates for each VRP location for the visualisation specialist to prepare photomontages; and,
- Following the selection of VRPs, photo-realistic images (photomontages) of the project were prepared by Macro Works.

9.2.3 Study Area

From similar studies, it is anticipated that the project is likely to be difficult to discern beyond approximately 5km due to the flat to low rolling nature of the study area; and

the project is not likely to give rise to significant landscape or visual effects beyond approximately 1-2km. In the interests of a comprehensive appraisal, a 5km-radius study area has been applied in this instance. However, there will be a particular focus on the 5km study radius surrounding the proposed substation and more specifically on receptors contained within 1-2km (central study area) of the electricity substation site, except where iconic or designated scenic viewpoints exist at greater distances out to 5km.

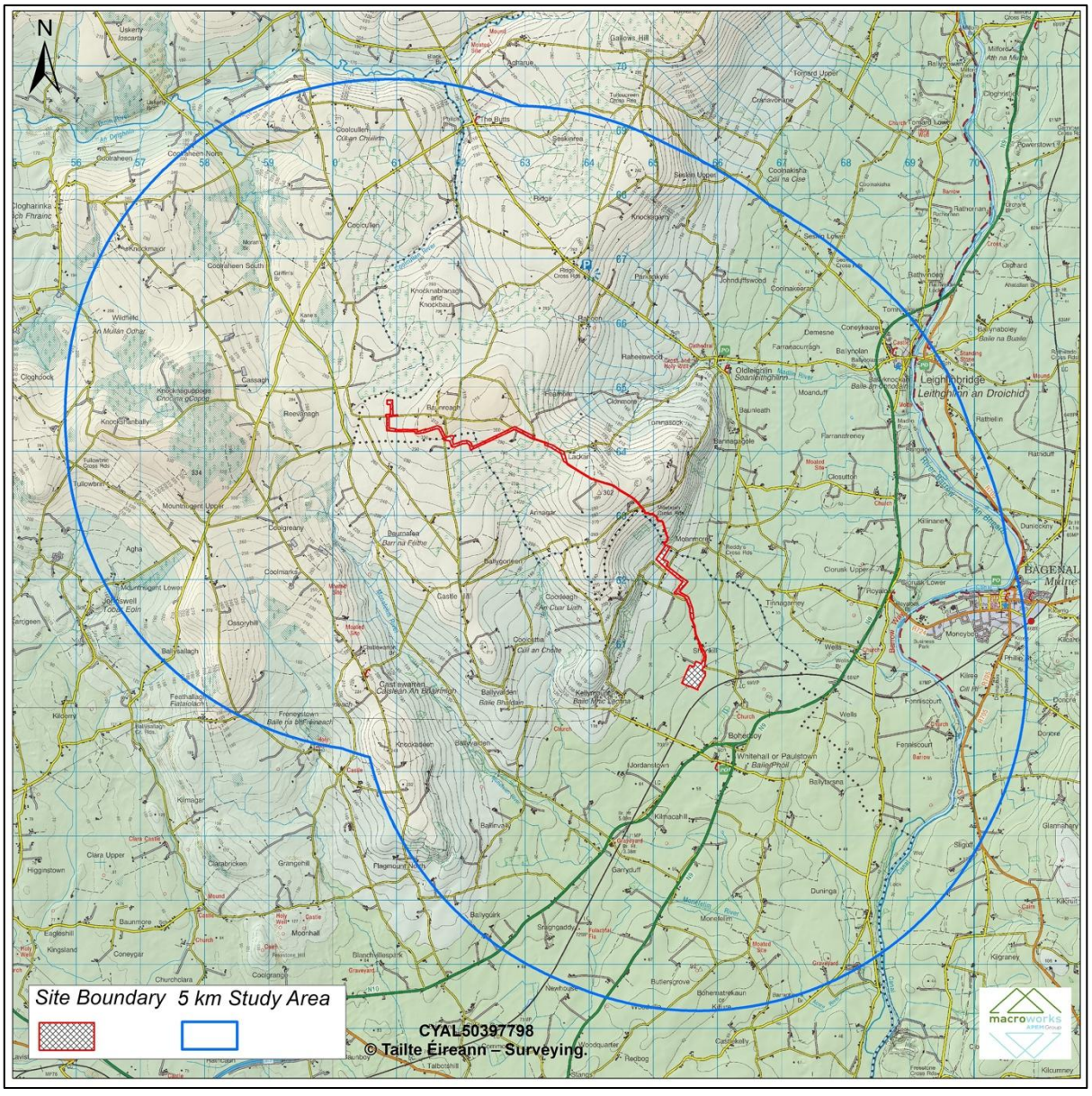

Figure 9.1: Extent of the 5km Study Area

9.2.4 Landscape Impact Assessment Criteria

The assessment of landscape effects evaluates how the introduction of the project will affect the physical features and fabric of the landscape and how the project will influence landscape character with reference to published descriptions of character and an understanding of the contemporary character of the landscape, as informed through desktop and site studies.

When assessing the likely landscape effects of the project, the value and sensitivity of the landscape receptor is weighed against the magnitude of impact to determine the significance of the landscape effect. Criteria outlined below are used to guide

these judgements.

9.2.3.1 Landscape Sensitivity

The sensitivity of the landscape to change is the degree to which a particular setting can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. In accordance with GLVIA3, the sensitivity of a landscape receptor (Landscape Character Area or feature) is derived from combining judgements in relation to its susceptibility to change and its value. The judgement reflects such factors as its quality, value, contribution to landscape character and the degree to which the particular element or characteristic can be replaced or substituted. Landscape Sensitivity is classified using the criteria set out at **Table 9.1** below.

Sensitivity	Description
Very High	Areas where the landscape character exhibits a very low capacity for change in the form of development. Examples of which are high value landscapes, protected at an international or national level (World Heritage Site/National Park), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the landscape character exhibits a low capacity for change in the form of development. Examples of which are high value landscapes, protected at a national or regional level (Area of Outstanding Natural Beauty), where the principal management objectives are likely to be considered conservation of the existing character.
Medium	Areas where the landscape character exhibits some capacity and scope for development. Examples of which are landscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.
Low	Areas where the landscape character exhibits a higher capacity for change from development. Typically, this would include lower value, non-designated landscapes that may also have some elements or features of recognisable quality, where landscape management objectives include, enhancement, repair and restoration.
Negligible	Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and/or restoration to realise a higher landscape value.

Table 9.1: Landscape Value and Sensitivity

9.2.5 Magnitude of Change – Landscape

The magnitude of change is a product of the scale, extent or degree of change that is likely to be experienced as a result of the project and, to a lesser extent, the duration and reversibility of that effect. The magnitude takes into account whether there is a direct physical impact resulting from the loss of landscape components and/or a change that extends beyond the immediate setting that may have an effect on the landscape character. **Table 9.2** outlines criteria used to inform this judgement.

Criteria	Description
Very High	Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an extensive change of the landscape in terms of character, value and quality.
High	Change that would be more limited in extent and scale with the loss of important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to a considerable change of the landscape in terms of character, value and quality.
Medium	Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new

	uncharacteristic elements or features that would lead to noticeable changes in landscape character, and quality.
Low	Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements that would lead to discernible changes in landscape character, and quality.
Negligible	Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable leading to no material change to landscape character, and quality.

Table 9.2: Magnitude of Change – Landscape

9.2.6 Visual Impact Assessment Criteria

The assessment of visual impact evaluates how the introduction of the project will affect views within the landscape. It therefore needs to consider:

- Direct impacts of the project upon views through intrusion or obstruction;
- The reaction of viewers who may be affected, e.g. residents, walkers, road users; and,
- The overall impact on visual amenity.

In accordance with best practice guidance, it has been deemed appropriate to structure the assessment around a series of representative viewpoint locations. All viewpoints are located within the public domain and are representative of views available from main thoroughfares and pedestrian areas within the vicinity of the project. The selected viewpoints are considered to be comprehensive in communicating the variable nature of the visual effects.

When assessing the likely visual effects of the development, the sensitivity of the visual receptor is weighed against the magnitude of the visual impact to determine the significance of the visual effect. Criteria outlined below are used to guide these judgements.

9.2.6.1 Sensitivity of Visual Receptors

As with landscape sensitivity, the sensitivity of a visual receptor is categorised as Very High, High, Medium, Low, and Negligible. Unlike landscape sensitivity however, the sensitivity of visual receptors has an anthropocentric (human) basis. It considers factors such as the perceived quality and values associated with the view, the landscape context of the viewer, the likely activity the viewer is engaged in and whether this heightens their awareness of the surrounding environment.

A list of the factors considered by the assessor in estimating the level of sensitivity for a particular visual receptor is outlined below to establish visual receptor sensitivity at each viewpoint location.

9.2.6.2 Susceptibility of Visual Receptors to Change

In accordance with GLVIA3, visual receptors most susceptible to changes in views and visual amenity are:-

- Residents at home;
- People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views;
- Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience;

- Communities where views contribute to the landscape setting enjoyed by residents in the area; and,
- Travellers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened.

Visual receptors that are less susceptible to changes in views and visual amenity include:-

- People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape; and,
- People at their place of work whose attention may be focussed on their work or activity, not their surroundings and where the setting is not important to the quality of working life.

9.2.6.3 Values attached to Views

The value attached to a view is determined by considering the following:-

- Recognised scenic value of the view (Development Plan designations, guidebooks, touring maps, postcards etc). These represent a consensus in terms of which scenic views and routes within an area are strongly valued by the population because in the case of County Developments Plans, for example, a public consultation process is required;
- Views from within highly sensitive landscape areas. These are likely to be in the form of Architectural Conservation Areas, which are incorporated within the Development Plan and therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the landscape around them;
- Primary views from residential receptors. Even within a dynamic city context, views from residential properties are an important consideration in respect of residential amenity;
- Intensity of use, popularity. This relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at a national or regional scale;
- Provision of vast, elevated panoramic views. This relates to the extent of the view on offer and the tendency for receptors to become more attuned to the surrounding landscape at locations that afford broad vistas;
- Sense of remoteness and/or tranquillity. Receptors taking in a remote and tranquil scene, which is likely to be fairly static, are likely to be more receptive to changes in the view than those taking in the view of a busy street scene, for example;
- Degree of perceived naturalness. Where a view is valued for the sense of naturalness of the surrounding landscape it is likely to be highly sensitive to visual intrusion by distinctly manmade features;
- Presence of striking or noteworthy features. A view might be strongly valued because it contains a distinctive and memorable landscape / townscape feature such as a cathedral or castle;
- Historical, cultural and / or spiritual significance. Such attributes may be evident or sensed by receptors at certain viewing locations, which may attract visitors for the purposes of contemplation or reflection heightening the sense of their surroundings;
- Rarity or uniqueness of the view. This might include the noteworthy representativeness of a certain landscape type and considers whether the receptor could take in similar views anywhere in the broader region or the country;

- Integrity of the landscape character. This looks at the condition and intactness of the landscape in view and whether the landscape pattern is a regular one of few strongly related components or an irregular one containing a variety of disparate components;
- Sense of place. This considers whether there is special sense of wholeness and harmony at the viewing location; and,
- Sense of awe. This considers whether the view inspires an overwhelming sense of scale or the power of nature.

It is recognised that a viewer's interpretation and experience of the landscape can have preferential and subjective components. Where relevant, judgements are made on those elements of the landscape that are considered to contribute more prominently and positively to the visual landscape resource as well as those elements that contribute negatively. Overall sensitivity may be a result of a number of these factors or, alternatively, a strong association with one or two in particular.

9.2.7 Magnitude of Change - Visual

The magnitude of change is again a product of the scale, extent, or degree of change that is likely to be experienced as a result of the project. This is directly influenced by its 'visual presence/prominence', as experienced by visual receptors in the landscape. These terms are somewhat quantitative in nature, and essentially relate to how noticeable or dominant the project is within a particular view. Aside from the obvious influence of scale and distance, a project's visual presence is influenced by the extent and complexity of the view, contextual movement in the landscape, the nature of its backdrop, and its relationship with other focal points or prominent features within the view. It is often, though not always, expressed using one of the following terms: Minimal; Sub-dominant; Co-dominant; Dominant; Highly dominant. Criteria used to inform judgements are provided at **Table 9.3**.

Criteria	Description
Very High	Complete or very substantial change in view, dominant, involving complete or very substantial obstruction of existing view or complete change in character and composition of baseline, e.g., through removal of key elements.
High	A major change in the view that is highly prominent and has a strong influence on the overall view. This may involve the substantial obstruction of existing views or a complete change in character and composition of baseline, e.g. through removal of key elements or the introduction of new features that would heavily influence key elements.
Medium	Moderate change in view: which may involve partial obstruction of existing view or partial change in character and composition of baseline, i.e., pre-development view through the introduction of new elements or removal of existing elements. Change may be prominent but would not substantially alter scale and character of the surroundings and the wider setting. View character may be partially changed through the introduction of features which, though uncharacteristic, may not necessarily be visually discordant.
Low	Minor change in baseline, i.e. pre-development view - change would be distinguishable from the surroundings whilst composition and character would be similar to the pre change circumstances.
Negligible	Very slight change in baseline, i.e. pre-development view - change would be barely discernible. Composition and character of view substantially unaltered.

Table 9.3: Magnitude of Change – Visual

9.2.8 Significance of Effect

The significance of a landscape or visual effect is based on a balance between the sensitivity of the receptor and the magnitude of change, and is categorised as Profound, Substantial, Moderate, Slight, or Imperceptible. Intermediate judgements

are also provided to enable an effect to be more accurately described where relevant. 'No Effect' may also be recorded as appropriate where the effect is so negligible that it is not noteworthy.

The significance category judgement is arrived at using the Significance Matrix at **Table 9.4** as a guide. This applies the principle of significance being a function of magnitude weighed against sensitivity, but employs slightly different terminology that avoids the potentially confusing use of the term 'significant' (as recommended by GLVIA3 Statement of Clarification 1/13 (Landscape institute, 10 June 2013)).

Indicative criteria descriptions used in relation to the significance of effect category are presented at **Table 9.5**.

Magnitude	Sensitivity of Receptor				
	Very High	High	Medium	Low	Negligible
Very High	Profound	Profound-substantial	Substantial	Moderate	Slight
High	Profound-substantial	Substantial	Substantial - moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial - moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

Table 9.4: Significance Matrix

	Landscape	Visual
Profound	There are notable changes in landscape characteristics over an extensive area or a very intensive change over a more limited area.	The view is entirely altered, obscured or affected.
Substantial	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the landscape. There are notable changes in landscape characteristics over a substantial area or an intensive change over a more limited area.	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the visual environment. The proposal affects a large proportion of the overall visual composition, or views are so affected that they form a new element in the physical landscape.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends. There are minor changes over some of the area or moderate changes in a localised area.	An effect that alters the character of the visual environment in a manner that is consistent with existing and emerging trends. The proposal affects an appreciable segment of the overall visual composition, or there is an intrusion in the foreground of a view.
Slight	An effect which causes noticeable changes in the character of the landscape without affecting its sensitivities. There are minor changes over a small proportion of the area or moderate changes in a localised area or changes that are reparable over time.	An effect which causes noticeable changes in the character of the visual environment without affecting its sensitivities. The affected view forms only a small element in the overall visual composition or changes the view in a marginal manner.
Imperceptible	An effect capable of measurement but without noticeable consequences. There are no noticeable changes to	An effect capable of measurement but without noticeable consequences. Although the development may be

	landscape context, character or features.	visible, it would be difficult to discern resulting in minimal change to views.

Table 9.5: Indicative Significance of Effect Descriptions

It is important that the likely effects of projects are transparently assessed and understood in order to ensure that the competent authority can reach a balanced, well-informed judgement. As such, whilst the significance matrix and criteria provide a useful guide, the significance of an effect is ultimately determined by the landscape specialist using professional judgement and also in the context of occasionally using hybrid judgements to account for nuance.

Effects assessed as 'Substantial' or greater (shaded cells at **Table 9.4**) are considered to be the most notable in landscape and visual terms, and may be regarded as 'Significant'; albeit, it is important to note that this is not a reflection on their acceptability in planning terms.

9.2.9 Quality of Effects

In addition to assessing the significance of landscape/townscape effects and visual effects, EPA guidance also requires that the quality of the effects is determined. This could be negative/adverse, neutral, or positive/beneficial, as follows:-

- Positive Effects: A change which improves the quality of the environment;
- Neutral and/or balanced Effects: No effects, or imperceptible effects, within normal bounds of variation or the margin of forecasting error; and,
- Negative/adverse Effects: A change that reduces the quality of the environment.

In the case of new energy/infrastructure developments within rural and semi-rural settings, the landscape and visual change brought about by an increased scale and intensity of built form is seldom considered positive/beneficial. Effects in these contexts are generally considered adverse in nature or neutral, where the effect has little influence on the landscape/views. Therefore, unless otherwise stated, the quality of the landscape and visual effect judgements herein can be taken as negative.

9.2.10 Timescale of Effects

Landscape and visual effects are also categorised according to their duration:-

- Temporary – Lasting for 1-year or less;
- Short Term – Lasting 1-years to 7-years;
- Medium Term – Lasting 7-years to 15-years;
- Long Term – Lasting 15-years to 60-years; and,
- Permanent – Lasting over 60-years.

9.3 Description of Existing Environment

9.3.1 Landscape and Visual Policy Context and Designations

Whilst the electricity substation is entirely contained within the County Kilkenny, sections of the underground electricity line pass through the westernmost extent of County Carlow, and thus, it is important to assess landscape related policy context and designations from both counties Kilkenny and Carlow

9.3.1.1 *Kilkenny City & County Development Plan 2021-2027*

A Landscape Character Assessment was completed for County Kilkenny and is incorporated within the current *Kilkenny City & County Development Plan 2021-2027*

('the Kilkenny CDP'). This divides the landscape of County Kilkenny into 4 no. Landscape Character Types (LCTs) and 14 no. geographically specific Landscape Character Areas (LCAs). The electricity substation is located within the 'Transition Zone' landscape type and the 'B1: Castlecomer Plateau Southern Transition Zone' landscape character area (refer to **Figure 9.2**). This LCA is "*characterised by smooth, sloping terrain, which allows vistas over long distances. In such terrain, development can have a disproportionate visual impact in some areas, due to an inherent inability to be absorbed, physically or visually*". It is important to note that a short section of the underground electricity line also traverses the 'LCA B: Castlecomer Plateau' landscape character area.

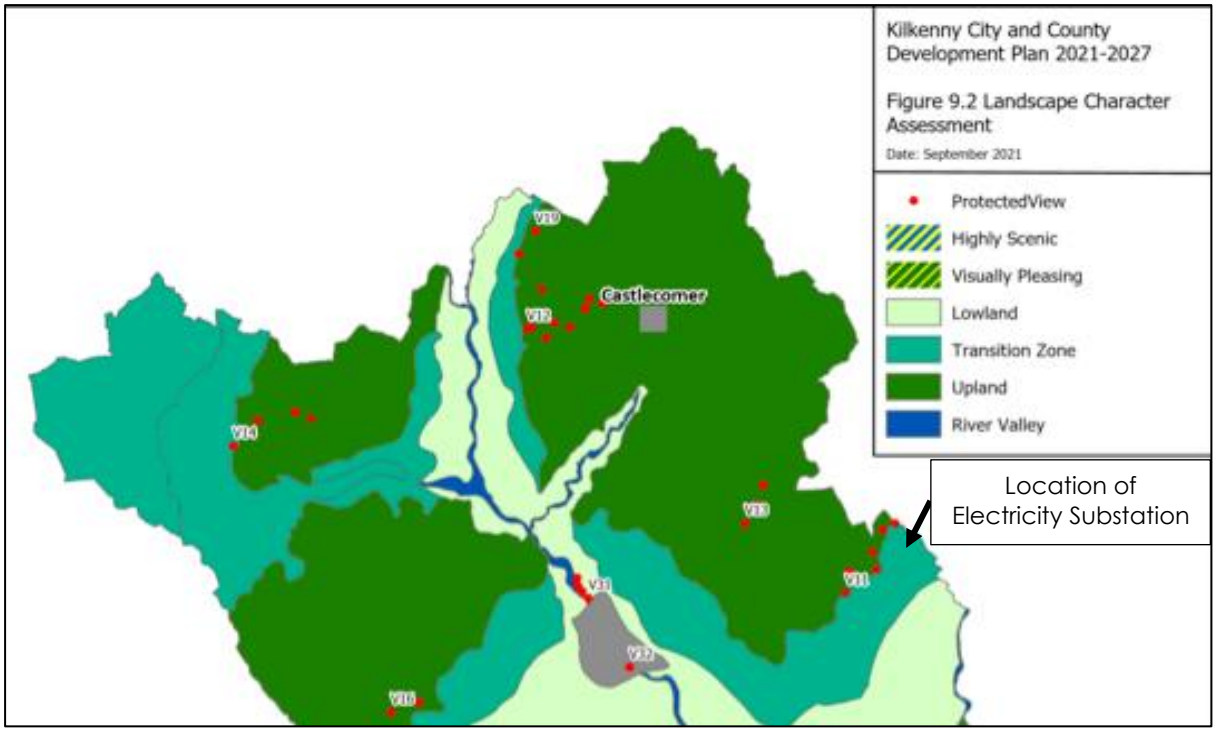

Figure 9.2: Excerpt from Figure 9.2 of the *Kilkenny City & County Development Plan 2021-2027*

The Kilkenny CDP identifies 'landscape areas of highly scenic and significant visual amenity value'; however, the nearest of these is c. 4km southeast of the project site and relates to the corridor of the River Barrow.

Landscape sensitivity within County Kilkenny is addressed by 'areas of greater sensitivity'. These are classified as "*areas throughout the county that are highly sensitive to development and have a limited capacity for change…in general, areas of elevated topography, with low growing or spare vegetation are little existing development are landscape of high sensitivity and have a low potential to absorb new development*". As identified at **Figure 9.3** below, the nearest areas of sensitivity relate to elevated terrain and sloping lands to the north of the electricity substation site. The Kilkenny CDP also sets out a number of 'development management requirements', some of which relate to the wind farm and are listed below:-

- *"To protect the landscape character, quality and local distinctiveness of County Kilkenny, and have regard to the guidance set out in the Landscape Character Assessment;*
- *Where necessary, to require that applications are accompanied by a visual impact assessment, particularly in upland areas, river valleys and areas of greater sensitivity;*
- *To facilitate appropriate development that reflects the scale, character and*

sensitivities of the local landscape throughout the county, and require that developments minimise the loss of natural features such as trees, hedgerows and stone walls;

- *To facilitate, where appropriate, developments that have a functional and locational natural resource requirement to be situated on steep or elevated sites (e.g. reservoir, telecommunications or wind energy structures) with reference to the appropriate County strategies currently in place, and to ensure that any residual adverse visual impacts are minimised or mitigated;*
- *To ensure that development in upland areas or on steep slopes will not have a disproportionate or dominating visual impact (due to excessive bulk, scale or inappropriate siting) and will not significantly interfere or detract from scenic upland vistas, or when viewed from public areas, scenic routes, viewpoints or settlements;*
- *To have particular regard to the potential impacts of new development on sensitive upland areas, and to materially consider the difficulty of establishing and maintaining screening vegetation when assessing development proposals in these areas; and*
- *To maintain the visual integrity of areas of greater sensitivity in the county and ensure that any development in these areas is appropriately sited and designed. Applicants shall demonstrate that the project can be assimilated into the landscape and will not have a disproportionate visual impact on the landscape."*

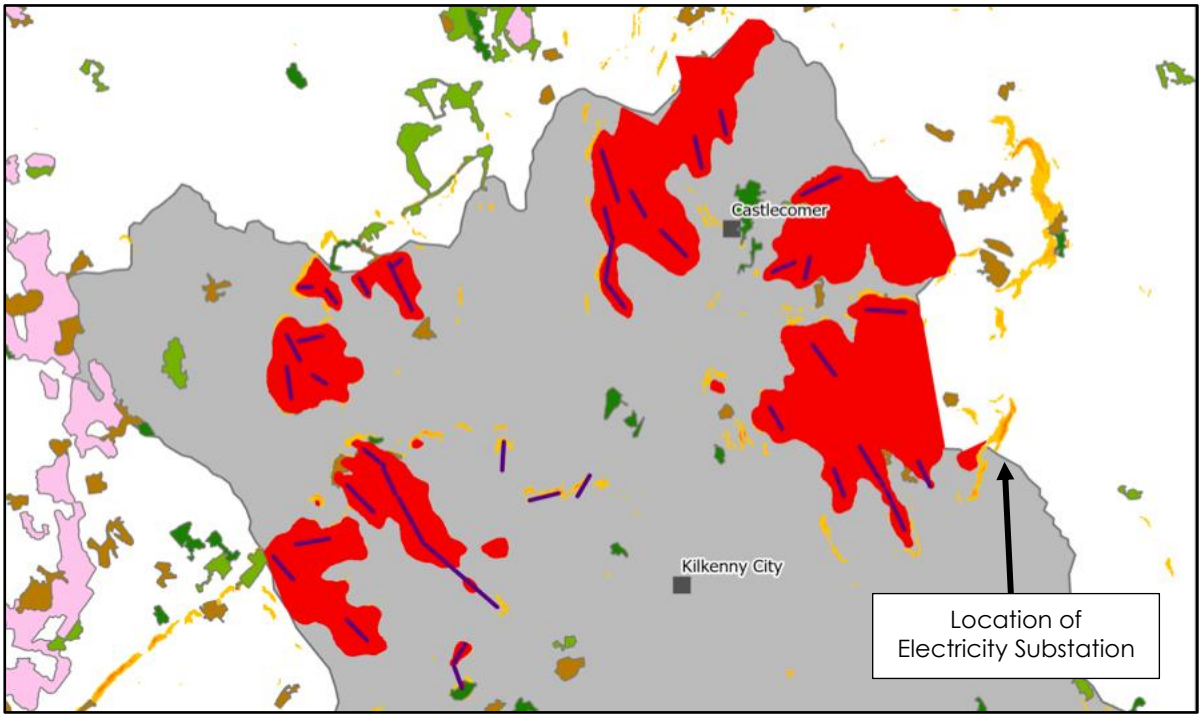

Figure 9.3: Excerpt from Figure 9.3 of the *Kilkenny City & County Development Plan 2021-2027*

9.3.1.2 *Carlow County Development Plan 2022-2028*

A Landscape Character Assessment has also been prepared and incorporated in the *Carlow County Development Plan 2022-2028* ('the Carlow CDP'). This divides the county into 4 no. specific LCAs. Whilst the electricity substation is located within lands in neighbouring County Kilkenny, the underground electricity line passes through lands in County Carlow and, more specifically, through the 'Killeshin Hills' LCA which is described as "*almost entirely a rural agricultural landscape with a moderate level of*

sensitivity and moderate potential capacity to absorb different types of development." 4 no. LCTs occur within the 'Killeshin Hills' LCA and include; 'Uplands', 'Farmed Ridges', 'Farmed Lowlands' and 'Broad River Valley'. The underground electricity line is entirely located within the 'Uplands' LCT and is designated with a level '5 – Most Sensitive' classification.

Nonetheless, whilst the project site is located within the level '5 – Most Sensitive' sensitivity classification, the Carlow CDP states that "*subject to appropriate mitigation measures there may also be moderate scope to absorb extractive industry and wind farming*" within the Killeshin Hills LCA. Whilst there are no land use classifications for electrical infrastructure within the current landscape assessment, the 'Killeshin Hills' LCA is classified as having an overall 'Moderate' capacity for 'wind farming' and a 'Low' capacity for 'industrial development'. General policy objectives for the Killeshin Hills LCA that are assessed as being relevant to the project are:-

- Balance conservation with enhancement of the existing landscape character; and,
- New developments to maintain integrity of landscape character area through careful location, siting and design.

9.3.2 Landscape Baseline

The landscape baseline represents the existing landscape context and is the scenario against which any changes to the landscape brought about by the project will be assessed. A description of the landscape context of the project site and study area is provided below under the headings of landform and drainage, vegetation and land use, centres of population and houses, transport routes and public amenities and facilities. Although this description forms part of the landscape baseline, many of the landscape elements identified also relate to visual receptors i.e. places and transport routes from which viewers can potentially see the project. The visual resource will be described in greater detail at **Section 9.3.3**.

9.3.2.1 Landform and Drainage

The electricity substation site is contained between the River Barrow and the elevated Castlecomer Plateau. It is located at the c. 70m contour and where the terrain is relatively flat. To the west, the terrain begins to swiftly ascend towards the Castlecomer Plateau whilst, to the east, the terrain levels off and comprises flat-to-low rolling lands that drain in a general easterly direction towards the River Barrow corridor. Whilst several small streams flow to the south and north of the electricity substation site, the River Barrow is the most prominent water course and is situated some c. 3km east of the site at its nearest point. The electricity line culminates at the electrical control unit in more elevated terrain located within the Castlecomer Plateau situated at a maximum elevation of c. 310m AOD.

9.3.2.2 Vegetation and Land Use

The predominant land use in respect of the project is pastoral farmland comprising small-to-medium-sized geometric fields bound by networks of clipped and mature hedgerows (refer to **Figure 9.4** below). Pockets of commercial conifer forestry are also located in the western extent of the study area and are principally associated with the elevated lands in the Castlecomer Plateau. A large quarry is one of the more notable single land uses and is located to the west of the electricity substation. Other notable single land uses include the corridors of both the M9 motorway and the national railway corridor, both situated to the east of the electricity substation site. Shankill Castle and Demense is a further notable single land use located to the east

of the electricity substation, whilst the settlements of Paulstown and Muine Bheag (Bagenalstown) account for the principal areas of urban land use within the study area.

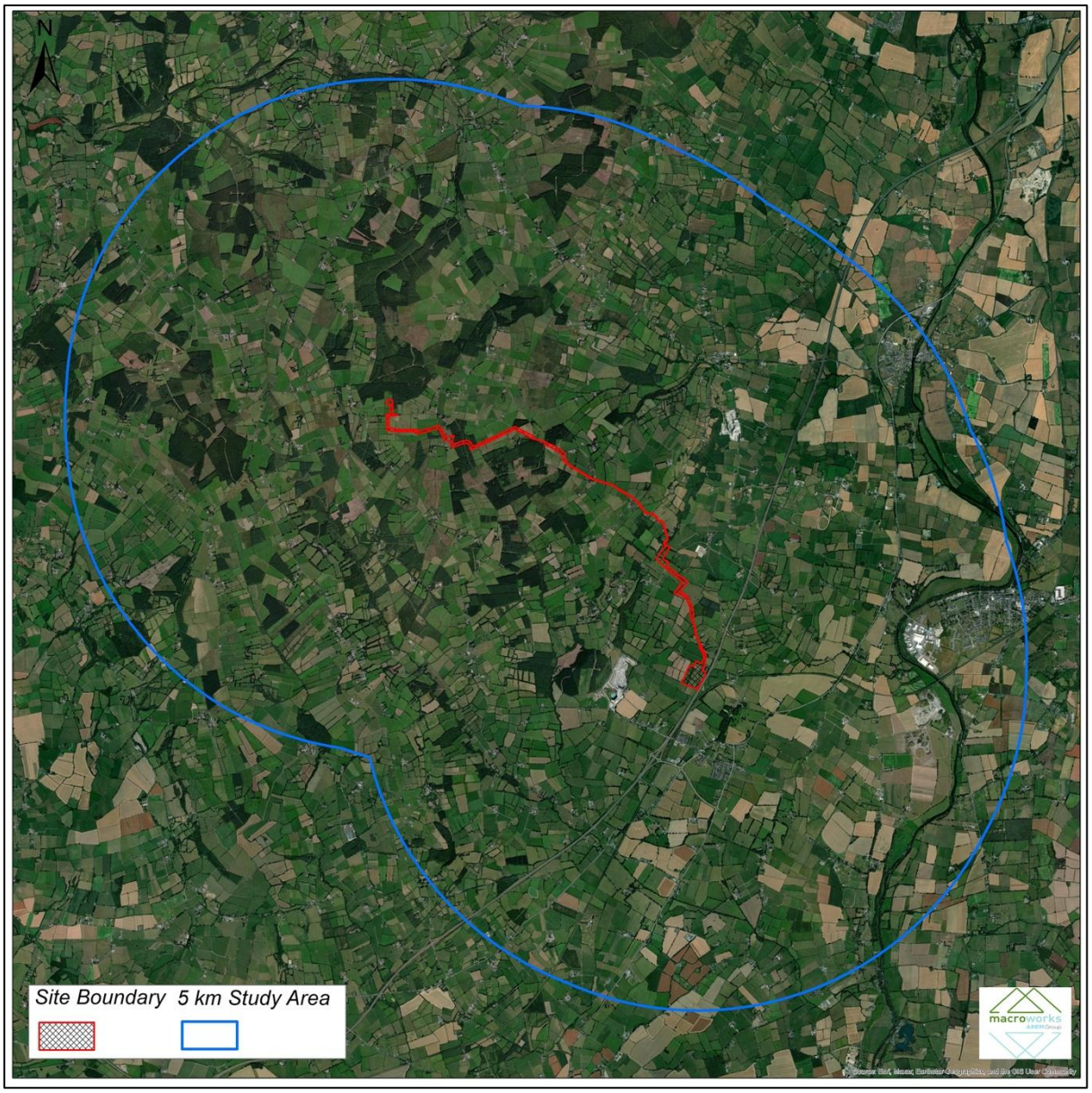

Figure 9.3 Landscape Context of the Study Area

9.3.2.3 Centres of Population and Housing

The principal urban centre in the immediate environs of the project is the small settlement of Paulstown, situated c. 800m southeast of the electricity substation. The larger settlement of Muine Bheag (Bagenalstown) is located c. 3km east of the electricity substation. The village of Oldleighlin is located c. 2km north of the underground electricity line at its nearest point. Otherwise, the surrounding landscape and study area comprises a loose arrangement of rural dwellings, with the most notable clusters of dwellings located in the less elevated lands to the east, in the vicinity of the motorway corridor, and its surrounding settlements. The nearest residential dwellings to the electricity substation compound are located c. 150m to the north, whilst a linear cluster of dwellings is situated c. 850m to the south.

9.3.2.4 Transport Routes

The principal transport route in the study area is the M9 motorway located c. 70m to the east of the electricity substation. Oriented in a generally north-south direction through the study area, the M9 is one of the principal transport routes in this part of Carlow/Kilkenny. Other major road corridors within the study area include the R448 and R712 regional roads, both of which are located to the east of the M9 motorway in the eastern half of the study area. Otherwise, the study area comprises a network of interconnecting local roads. The national railway line is also located in the study area and is situated c. 150m east of the electricity substation at its nearest point.

9.3.2.5 Tourism, Heritage and Public Amenities

Whilst the immediate context of the electricity substation and underground electricity line is not highly synonymous with outdoor recreation, the predominant amenity feature within the study area is the River Barrow which hosts a waymarked walking trail and is popular among anglers. Shankill Castle and Demesne is an historic stately home and demesne located to the east of the M9 motorway and c. 500m to the east of the electricity substation. Shankill House and Demesne is open to the public throughout the Spring, Summer and Autumn months.

9.3.3 Visual Baseline

The assessment of visual effects is only concerned with those parts of the study area that potentially afford views of the project. Therefore, the first part of the visual baseline establishes a 'Zone of Theoretical Visibility' and subsequently identifies important visual receptors on which to base the visual impact assessment.

9.3.3.1 Zone of Theoretical Visibility

A computer-generated Zone of Theoretical Visibility (ZTV) map has been prepared to illustrate the locations from where the electricity substation is potentially visible. It is important to note that the ZTV map has been produced specifically in relation to the substation aspect of the development in this instance as it is the principal built feature of the project and has the most notable potential to generate adverse visual effects. The ZTV map is based solely on terrain data (bare ground visibility). It ignores features such as trees, hedges or buildings, which may screen or obscure views of the electricity substation. Given the complex vegetation patterns within this landscape, the main value of this form of ZTV mapping is to determine those parts of the landscape from which the electricity substation will not be visible due to terrain screening within the 5km study area. Given the sub-surface nature of the electricity line, it is not assessed in terms of theoretical visibility.

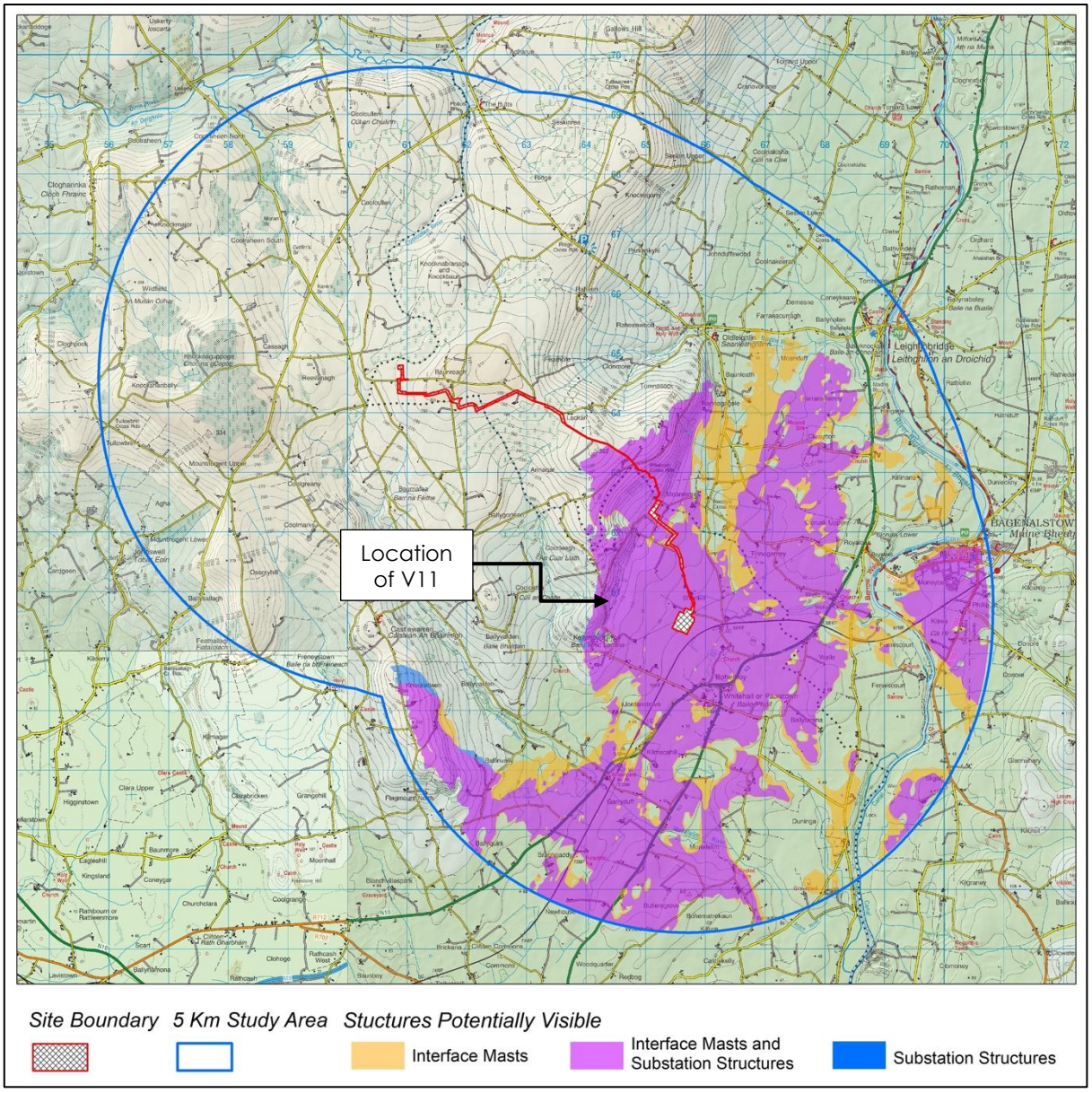

Figure 9.5: Zone of Theoretic Visibility Map

A summary of the key findings from the Zone of Theoretical Visibility (ZTV) mapping (refer **to Figure** above) are as follows:-

- Whilst theoretical visibility of both the substation and interface masts is potentially afforded throughout much of the central portion of the study area, this tends to dissipate beyond c. 2km from the substation compound;
- To the west of the site, the potential for visibility of the site is entirely screened by the rolling terrain here. Indeed, beyond c. 2km to the east of the site, the project will be almost entirely screened aside from several rolling hills located in the wider southwest quadrant of the study area;
- Whilst there is a more notable potential for visibility throughout the eastern half of the study area, the electricity substation will be entirely screened in the surrounds of the wider corridor of the River Barrow; and,
- In terms of settlements, both the interface mast and electricity substation compound have the potential to be viewed from Paulstown to the southeast of the site and from Muine Bheag (Bagenalstown) to the east.

It is important to reiterate that the above ZTV mapping relates to a bare-ground

scenario and does not account for screening in the form of surrounding vegetation or built development. In this instance, the surrounding landscape comprises a high degree of mature intervening vegetation, which will result in the project being heavily screened beyond its immediate site context. Indeed, beyond the nearest surrounding local roads, it is only likely that there will be partial and intermittent visibility of the most elevated structures in the project.

9.3.3.2 Views of Recognised Scenic Value

Views of recognised scenic value are primarily indicated within County Development Plans in the context of scenic views/routes designations, but they may also be indicated on touring maps, guide books, road side rest stops or on post cards that represent the area.

All of the scenic routes and views that fall inside the ZTV pattern were investigated during fieldwork to determine whether actual views of the wind farm might be afforded. Where visibility may occur, a viewpoint has been selected for use in the visual impact appraisal later in this chapter.

Kilkenny City & County Development Plan 2021-2027

Views and prospects to be protected in County Kilkenny are contained in Appendix H and are illustrated at Figure 9.2 of the Kilkenny CDP. The most relevant designated view located within 5km of the project is outlined below:-

- View V11: View east and southeast into the Barrow Valley and lowland plains on the Castlecomer/Paulstown Road, the LP2625 and LT6675 (between the junctions of road nos. LP2625/LS6671 and LT6675/L2623). Also, the view on the L6671 from the county boundary to its junction with the L2625.

All scenic views within the study area that fall within the ZTV pattern will be investigated during site visits. Where views of the project have the potential to be afforded from these designated views, representative viewpoints will be included within the visual impact assessment.

Carlow County Development Plan 2022-2028

Part 6 of the County Carlow Landscape Character Assessment, which forms part of the Carlow CDP, includes a schedule of views prospects and scenic routes. There are no scenic views or scenic routes within the study area in County Carlow.

9.3.3.3 Identification of Viewshed Reference Points as a Basis for Assessment

The Zone of Theoretical Visibility analysis results provide a basis for selecting VRPs, which are the locations used to study the landscape and visual impact of the project in detail. It is not warranted to include every location that provides a view of this development, as this would result in an unwieldy report and make it extremely difficult to draw out the key impacts arising from the project. Instead, receptor locations were selected that are likely to provide views of the project from different distances, angles, and contexts.

The visual impact of the project is assessed using up to 6 no. categories of receptor type as listed below:-

- Key Views (from features of national or international importance) (KV);
- Designated Scenic Routes and Views (SR/SV);
- Local Community views (LCV);
- Centres of Population (CP);
- Major Routes (MR); and,
- Amenity and heritage features (AH).

Key Views

These VRPs are at features or locations that are significant at the national or even international level, typically in terms of heritage, recreation or tourism. They are locations that attract many viewers who are likely to be in a reflective or recreational frame of mind, possibly increasing their appreciation of the landscape around them. The location of this receptor type is usually quite specific.

Designated Scenic Routes and Views

Due to their identification in a County Development Plan, this type of VRP location represents a general policy consensus on locations of high scenic value within the study area. These are commonly elevated, long-distance panoramic views that may or may not be mapped from precise locations. They are more likely to be experienced by static viewers who seek out or stop to take in such vistas.

Local Community Views

This type of VRP represents those people who live and/or work in the locality of the project. Although the VRPs are generally located on local level roads, they also represent similar views that may be available from adjacent houses. The precise location of this VRP type is not critical; however, clear elevated views are preferred, particularly when closely associated with a cluster of houses and representing their primary views. Coverage of a range of viewing angles using several VRPs is necessary in order to sample the spectrum of views that would be available from surrounding dwellings.

Centres of Population

VRPs are selected at population centres primarily due to the number of viewers likely to experience that view. The relevance of the settlement is based on the significance of its size in terms of the study area or its proximity to the site. The VRP may be selected from any location within the public domain that provides a clear view of the project within or close to the settlement.

Major Transport Routes

These include national and regional level roads and rail lines and are relevant VRP locations due to the number of viewers potentially impacted by the project. The precise location of this category of VRP is not critical. It might be chosen anywhere along the route that provides clear views towards the site, but with a preference towards close and/or elevated views. Major routes typically provide views experienced whilst in motion, and these may be fleeting and intermittent depending on screening by intervening vegetation or buildings.

Tourism, Recreational and Heritage Features

These views are often the same given that heritage locations can be important tourist and visitor destinations, and amenity areas or walking routes are commonly designed to incorporate heritage features. Such locations or routes tend to be sensitive to development within the landscape as viewers are likely to be in a receptive frame of mind concerning the landscape around them. The sensitivity of this type of visual receptor is strongly related to the number of visitors they might attract and, in the case of heritage features, whether these are discerning experts or lay tourists. Sensitivity is also heavily influenced by the viewer's experience at a heritage site as distinct from simply the view of it. This complex phenomenon is likely to be different for every site.

Experiential considerations might relate to the sequential approach to a castle from the car park or the view from a hilltop monument reached after a demanding climb. It might also relate to the influence of contemporary features within a key view and whether these detract from a sense of past times. It must also be noted that the sensitivity rating attributed to a heritage feature for a landscape and visual assessment is not synonymous with its importance to the archaeological or architectural heritage record.

VRPs may be relevant to more than one category which increases their validity for inclusion in the assessment. The receptors that are intended to be represented by a particular VRP are listed at the beginning of each viewpoint appraisal. The VRPs selected in this instance are set out in **Table 9.6** and illustrated at **Figure 9.6** below.

VRP No.	Location	Representative of	Direction of View
VP1	Local road at Shankill, west of site	SV, LCV	SE
VP2	Local road at Shankill, north of site	LCV	S
VP3	Local road laneway east of the M9 at Shankill	LCV, MR	SW
VP4	R448 east of Shankill Demesne	LCV, AH	W
VP5	An Choill Rua Residential Estate	CP, LCV	N
VP6	Local road at Shankill, south of site	LCV	N

Table 9.6 Outline Description of Selected VRPs

Figure 9.6: Viewpoint Map

9.4 Description of Likely Effects

9.4.1 Do-Nothing Scenario

The 'do-nothing' effect refers to the non-implementation of the project. The primary effect of this would be that those identified would not directly occur. The site, which is predominately contained in pastoral farmland, would likely be managed for typical agricultural practices, whilst the surrounding perimeter vegetation would continue to grow out, some of which would be maintained by the current landowners.

9.4.2 Assessment of Receptor Sensitivity – Landscape

Landscape value and sensitivity are assessed in relation to a number of factors highlighted in the GLVIA 2013, which are set out below and discussed relative to the project site and wider study area.

This is a robust rural landscape that is notably influenced by several highly anthropogenic land uses, such as the M9 motorway corridor, the railway line and a large quarry situated to the southwest of the proposed substation. Nonetheless, the study area presents as a relatively typical rural landscape, albeit with some distinctive landscape features in the wider area, such as the Castlecomer Plateau and the River

Barrow. These features present with a heightened degree of sensitivity due to the sense of scenic amenity in their surrounds and due to the sense of the naturalistic in the surrounds of the River Barrow.

The heightened sense of scenic amenity is reflected in the Kilkenny CDP and Carlow CDP, which identify 'areas of greater sensitivity' in the surrounds of the elevated lands in Kilkenny, whilst the uplands to the north and northwest of the site in County Carlow are classified with a 'most sensitive' landscape classification. In terms of designated scenic amenity, 1 no. protected view is located in the western extent of the study area and is associated with elevated views from the Castlecomer Plateau that afford broad views across the wider Carlow Central Plain.

Notwithstanding the above sensitives within the study area, much of the surrounding landscape reflects a relatively typical robust working landscape that has been heavily influenced by longstanding human intervention. This is principally reflected in the surrounding field patterns, which comprise a patchwork of farmland intersected by blocks of commercial conifer forest and other utilitarian landscape features and land uses. Overall, it is assessed that the study area is a working rural landscape that is not highly rare or unique and where the main landscape values relate to the sustenance of the rural economy as opposed to any highly sensitive landscape values.

Therefore, on balance of these factors and in accordance with the criteria outlined in **Table 9.1**, the landscape sensitivity is assessed to be Medium-low, with localised areas of higher and lower sensitivity.

9.4.3 Assessment of Receptor Sensitivity – Visual

The study area generally presents as a typical rural landscape although though some localised areas of higher sensitivity are present in its wider surrounds. The more elevated and scenic parts of the surrounding landscape are typically identified by the presence of scenic routes and view designations. Nonetheless, it is important to note that scenic views and routes within County Kilkenny and County Carlow all present with different degrees of sensitivities and values. Indeed, some scenic designations relate to views of local value, whereas others are recognised more for their regional and national values. The only scenic designation within the study area is contained to the west of the site (V11) and relates to the broad views across the wider Carlow Central Plain to the east. Whilst the views afforded from here present with a notable sense of scenic amenity, they are heavily influenced by typical working land uses and other anthropogenic land uses such as pastoral farmland, major transport corridors and existing industrial land uses. Indeed, these elevated views present with a longstanding sense of human intervention on the landscape. Nonetheless, these elevated lands and scenic designations are assessed to have a receptor sensitivity ranging between High-medium to High

The study area also comprises some locally susceptible areas that are afforded a strong sense of containment, such as the Barrow River corridor, which is noted for its recreational and naturalistic values, and Shankill Castle and Demesne, which encompasses some sense of amenity and heritage. These parts of the landscape are typically highly susceptible to change and range in sensitivity between Medium to High-medium depending on their influence from other surrounding landscape areas.

Views of the working agricultural landscape are generally pleasant in terms of its rolling pastoral aesthetic and 'green', settled working character. The network of hedgerows and vegetation throughout the landscape contributes to some sense of naturalness and, combined with its undulating topography, generates a sense of containment in many locations. However, whilst a pleasant pastoral aesthetic is noted throughout

some parts of the study area, as noted above, the surrounding local and wider landscape is also influenced by an array of anthropogenic features such as major transport routes, urban settlements, and industrial development. Overall, the sensitivity of visual receptors within the more typical working landscape context tends to range between Medium and Medium-low, with those of a Medium sensitivity representing more open expansive views across the wider landscape.

Key differentials in terms of visual receptor sensitivity relate to the occupation of the visual receptor and whether views of the surrounding landscape are an inherent part of the experience. Static residential receptors are considered generally more susceptible to changes in views over those where views are experienced transiently by those travelling through the landscape, particularly on major transport routes where road infrastructure and traffic volume draw from visual amenity. Likewise, receptors located in closer proximity to the site are considered more susceptible to changes in views over those where views are experienced at a distance.

On the basis of the site-specific factors outlined above and in accordance with the general visual receptor sensitivity considerations described at **Section 9.2.6**, visual receptor sensitivity judgements are provided for each representative viewpoint in the table below in the visual impact appraisal below.

9.4.4 Construction Phase

9.4.4.1 Magnitude of Landscape Effects

During the construction phase, there will be a far higher intensity of activity at the site than during the operational phase and decommissioning phase. This will consist of heavy vehicle movements to and from the site as well as construction machinery within the site.

Trenches will be excavated to allow the installation of ducting and the electricity line below ground level. The physical effect of the trench on the landscape will be modest in scale and highly localised. There will be an increase in heavy goods vehicle movements within the road network near the project, which will be more noticeable along the local roads within the study area. Horizontal Directional Drilling techniques will be used at a number of watercourse crossings to avoid direct effects on the watercourses themselves.

During the construction phase, temporary landscape impacts may be experienced along the route. However, any effects would not be at a scale that would have any material effect on the overall landscape fabric or the landscape character in the study area. Although construction activity may alter the landscape character near where the electricity line is being installed, it will be transitory and temporary with all trenches being fully reinstated on completion of construction activities. There will be some temporary local stockpiling of excavated material, whilst machinery will likely be stored in local compounds along the route.

Construction phase effects are therefore assessed to be negative, transient, reversible and, in terms of duration, short-term (less than or equal to 1-year duration). During the construction phase, it is assessed that the underground electricity line will result in a low magnitude of effect.

There will also be some localised physical landscape impacts at the site of the electrical control unit. Physical landscape effects will be generated from the stripping of soil and excavation of an relatively modest area of existing pastoral land to accommodate the electrical control unit compound. There will be construction activity around the site, which is likely to adversely affect the local landscape

character. However, construction effects in the surrounds of the electrical control unit will be highly localised and temporary in duration.

Physical landscape impacts will occur during the construction phase at the electricity substation site. These will arise from disturbance to the landform and land cover for the various structures, building and access track. Topsoil and subsoil will be excavated as required for the electricity substation compound, control building foundations, electrical apparatus foundations, interface mast foundations and the access track. This is a generally flat site and there is no requirement to modify the existing terrain through substantial excavations. The project has been designed to minimise the generation of excess soil with excavated material to be re-used in the construction process insofar as possible. This approach has been adopted to minimise the effect on the physical landform and landscape. The existing land cover to be disturbed as part of the construction phase is predominantly agricultural grassland with minor works to be undertaken at an existing agricultural site entrance.

In addition to the permanent physical disturbance of the landform and land cover of the site during construction, there will also be temporary effects on the landscape character of the site and its immediate surroundings. This will occur due to the intensity of construction activities involving the movement of heavy vehicles to and from the site and within the site. There will be site welfare facilities, vehicle parking, and areas of the site dedicated to the storage of excavated earth and building materials. Construction plant and machinery and partially completed structures will also be characteristic elements of the construction phase and more visible from a broader area than surface-level construction activities. These are all typical construction phase activities for a project of this type and scale. They represent a noticeable increase when compared to the baseline activity levels experienced within and in the immediate environs of this rural site. However, there are few visual receptors within proximity of the substation site. It is assessed as likely that construction phase works will temporarily affect landscape character.

There will also be some removal of existing hedgerows totalling up to c. 140 linear meters, which will be removed to facilitate the full footprint of the electricity substation. Further sections of hedgerow will also be removed to accommodate the access tracks within the site. However, any such loss will be offset by the planting off c. 220 linear meters of new native hedgerow and bolstering of c. 920 linear meters of existing hedgerow, as necessary, to fill any existing gaps (refer to **Section 9.5** below).

Therefore, the magnitude of construction phase landscape effects arising from the electricity substation are assessed to be to be no greater than Medium-low. Effects arising from the construction of the control unit are assessed to be similar to that of the electricity substation but of a reduced magnitude.

Overall, coupled with the Medium-low visual landscape sensitivity of the site and its surrounds, the construction phase landscape effects at the site are assessed to be no greater than Moderate-Slight and will reduce to Slight beyond the immediate site context. With increased distance, the project site will be heavily screened by the layers of intervening vegetation. Construction phase landscape effects will be temporary in duration and are of a negative quality. As a result, construction phase landscape effects are not assessed as likely to be significant

9.4.4.2 Magnitude of Visual Effects

During construction, the main visual impacts will arise from frequent heavy vehicle movements and worker vehicles travelling to and from the site and using the site entrance. In addition, there will be construction machinery on site, which may rise

above intervening vegetation and buildings. There will also be stockpiles of stripped topsoil and construction materials awaiting use. However, aside from the site's immediate vicinity, a large part of this temporary activity will remain fully or partially screened from view as a result of the surrounding mature layers of intervening vegetation. Furthermore, construction-related activity is temporary in nature and will cease once the project becomes fully operational. Thus, the construction phase is assessed as likely to result in a visual effect of in the immediate surroundings of the site.

Coupled with the Medium and Medium-low visual receptor sensitivities in the near surrounds of the site, the construction phase visual impacts in the immediate vicinity of the site will be no greater than Slight, and will reduce considerably beyond 500m-1,000m from the site, where the project will be heavily, and in many cases entirely, screened. Construction phase visual effects are assessed to be temporary in duration and of a negative quality. As a result, construction phase visual effects are not assessed as likely to be significant.

9.4.5 Operational Phase

9.4.5.1 Magnitude of Landscape Effects

In terms of the operational phase of the project, there will be no notable physical effects on the terrain of the site as it will generally remain unaltered. Whilst there will be a clear change in the land use at the site context, the scale of this change will be difficult to discern at surrounding receptors due to the layers of existing perimeter vegetation, some of which will be enhanced as part of the proposed landscaping measures. Indeed, the likelihood of the electricity substation or electrical control unit notably impacting the surrounding landscape character is heavily diminished by the fact that the substation and electrical control will be heavily screened and softened by the layers of existing and enhanced hedgerow vegetation. With regard to the proposed electrical control unit, it is well offset from the local road and will be afforded a notable degree of screening due to existing vegetation which diminishes the likelihood of a significant change to the local landscape character. Indeed even if viewed from the public road, the electrical control unit will likely present in combination with the permitted wind farm development and will likely be perceived as ancillary to the wind farm. With regard to the underground electricity line, there will be little evidence of this during the operational phase of the development once the trenches have been fully reinstated.

In relation to landscape character, the project will see the introduction of some highly anthropogenic forms and features (electricity substation and electrical control unit) introduced to a typical pastoral setting. Whilst electrical infrastructure developments are not uncommon in the rural landscape, the forms and built components of the project will strongly contrast with the more organic forms of the surrounding vegetation and the verdant tones and textures of this pastoral context. Nevertheless, it is important to note that the full extent of these anthropogenic built features will not be readily visible at even the nearest surrounding receptors, which diminishes the likelihood of the project to notably detract from the surrounding rural character, which is also influenced by an array of other highly anthropogenic land uses and built features.

On the basis of the factors discussed above, it is assessed that the magnitude of operational phase landscape effects is Medium-low within the immediate environs of the project site reducing to Low beyond the immediate site context. Thereafter, the magnitude of the operational phase landscape impact is assessed as reducing to

Low-negligible and Negligible, with increased distance, as the project becomes a progressively smaller component of the overall landscape fabric.

With reference to the significance matrix (

Magnitude	Sensitivity of Receptor				
	Very High	High	Medium	Low	Negligible
Very High	Profound	Profound-substantial	Substantial	Moderate	Slight
High	Profound-substantial	Substantial	Substantial - moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial - moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

Table 9.4) above, the Medium-low landscape sensitivity judgement attributed to the study area, coupled with a Medium-low magnitude of landscape impact in the immediate environs of the project is assessed as resulting in an overall significance of no greater than Moderate-slight, reducing to Slight beyond the immediate site context, with the remainder of the 5km radius study area likely to experience Slight-imperceptible or Imperceptible landscape effects. Operational phase effects arising from the project are assessed to be permanent in terms of duration and are of a negative-neutral quality. Overall, operational phase landscape effects generated by the project are not assessed to be significant.

9.4.5.2 Magnitude of Visual Effects

The assessment of visual impacts at each of the selected viewpoints is aided by photomontages of the project (see **Annex 9.1**; **Volume II**). Photomontages are a 'photo-real' depiction of the project within the view utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale. For each viewpoint, the following images have been produced:-

- Existing view;
- Outline view (yellow outline showing the extent of the project overlaid on the photograph);
- Montage view (depicting the project in the landscape in the absence of any mitigation screening/planting); and,
- Montage view with mitigation established.

VRP No.	Existing View	VP Sensitivity	Visual Impact Magnitude (Pre & Post Mitigation)	Residual Significance of effect
VP1	Local road at Shankill, west of electricity substation site – This is an elevated scenic view (V11) afforded from an elevated section of local road in the townland of Shankill. The depicted view is oriented to the east, where the terrain descends swiftly and is contained in dense intervening layers of mature vegetation. A near section of mature hedgerow vegetation partially screens the fore-to-middle distant landscape, whilst in the background, the wider Carlow Central Plain is cloaked in pastoral farmland and layers of intervening vegetation. In the distant background, the view is contained by the Wicklow Mountains.	High	The electricity substation will be entirely screened by the dense layers of intervening mature vegetation. Even if briefly glimpsed from surrounding elevated sections of this scenic view, the substation will present as a very small built feature in the sweeping panoramas afforded from the surrounding elevated lands and will have no notable effect on the visual amenity afforded from here. Thus, the magnitude of visual effect is assessed to be Negligible. The proposed landscaping measures will not, at this distance, have any visual screening effect. The electricity line will be located entirely underground and will not be visible. The electrical control unit is located in the opposite direction of the vista, at a distance of c. 5km, and will have no impact on this viewpoint.	Imperceptible/Neutral /Permanent
VP2	Local road at Shankill, north of electricity substation site – This is a partially contained view afforded from a local road laneway adjacent to a remote residential rural dwelling. The depicted view is oriented towards the adjacent residential land holding and is contained at a short distance by the surrounding clipped hedge and layers of mature hedgerow vegetation beyond the dwelling.	Medium-low	Despite the near distance to the electricity substation and interface masts, there will be little clear visibility of the infrastructure due to the high degree of mature surrounding vegetation. Indeed, the most notable aspect of visual change here relates to the removal of a small extent of hedgerow vegetation to the west of this dwelling that will facilitate the site access tracks. However, it is important to note that a new section of hedgerow will be planted to the west of the new access track to replace the hedgerow loss. Otherwise, the only residual visibility of the project will be in the form of brief glimpses of the lightning masts, which are slender structures and will have a very limited visual presence in this view. Overall, the magnitude of visual effect is assessed to be no greater than Low-negligible. The underground electricity line and electrical control unit will not be visible from this viewpoint.	Slight-Imperceptible/ Neutral/Permanent
VP3	Local road laneway east of the M9 at Shankill – This is a view afforded from the end of a local road laneway immediately east of the M9. The depicted view is representative of the major route receptor and surrounding local community receptors and is contained at a	Low	The project (electricity substation, underground electricity line and electrical control unit) is entirely screened from here by a combination of the stacked vegetation and terrain in the direction of the project. Indeed, even from the immediate corridor of the M9, the electricity substation and interface masts will be entirely screened and no	Imperceptible/Neutral /Permanent

	near distance by the dense stacked vegetation on the opposite side of the M9 corridor, which is screened from view by nearby scrubby grassland and vegetation.		visibility is afforded. Thus, the magnitude of effect is assessed to be Negligible by default.	
VP4	R448 east of Shankill Demesne – This is a view afforded from a section of the R448 regional road located adjacent to Shankill Demesne and is representative of the heritage asset and major route. The view extends west towards the main axial view of Shankill Castle and is otherwise contained by mature trees located throughout the demesne.	High-Medium	The project is entirely screened from here by the dense layers of intervening vegetation in the direction of the project site. Thus, the magnitude of visual effect is assessed to be Negligible by default. The underground electricity line and electrical control unit will not be visible from this viewpoint through a combination of infrastructure characteristics (underground electricity line), intervening topography, vegetation and distance .	Imperceptible/Neutral /Permanent
VP5	An Choill Rua Residential Estate - This is a view from a residential estate on the outskirts of Paulstown and immediately east of the M9 corridor. The view is partially contained by a low hedgerow on the opposite side of the local road, albeit some distant visibility of rolling terrain cloaked in pastoral farmland is afforded in the distance.	Medium-low	The electricity substation is entirely screened from here by the dense layers of intervening vegetation in the direction of the site. Thus, the magnitude of visual effect is deemed Negligible by default. The underground electricity line and electrical control unit will not be visible from this viewpoint through a combination of infrastructure characteristics (underground electricity line), intervening topography, vegetation and distance.	Imperceptible/Neutral /Permanent
VP6	Local road at Shankill, south of electricity substation site – This is a relatively typical rural vista across pastoral fields from a local road in the townland of Shankill. The view is representative of surrounding local community receptors and is contained shortly beyond the neighbouring agricultural field by dense layers of mature hedgerow vegetation.	Medium-low	The electricity substation will be almost fully screened by the layers of intervening mature tree-lined hedgerows throughout the view. A partial glimpse of the lightning masts will be afforded from here, albeit their slender structure is unlikely to draw the eye of the casual observer. Thus, the magnitude of visual effect is deemed Negligible. The underground electricity line and electrical control unit will not be visible from this viewpoint through a combination of infrastructure characteristics (underground electricity line), intervening topography, vegetation and distance.	Imperceptible/Neutral /Permanent

9.4.6 Decommissioning Phase

Given that the electricity substation will form part of the national electricity network and will be owned and operated by EirGrid, it will not be decommissioned. Accordingly, effects during the decommissioning phase will be similar to those of the construction phase but of a substantially reduced magnitude. Adverse effects will arise due to the presence of plant and machinery, traffic movements associated with the removal of equipment and excavations associated with the decommissioning and removal of the electrical control unit and underground electricity line. It should be noted that the electricity line will be removed from its associated ducting; however, the ducting will remain in situ to minimise the extent of excavations required.

It is assessed, therefore, that the magnitude of effect will be Low with a significance of Slight-imperceptible.

9.4.7 Cumulative Effects

Cumulative effects will be assessed in the context of other relevant permitted and proposed developments within the study area (see **Chapter 1**), which are of a scale nature and proximity to generate material in-combination effects with the project. Existing developments are not included within this cumulative assessment as the already form part of the baseline context against which the main landscape and visual assessment has been conducted.

One of the more notable cumulative developments relates to the permitted White Hill Wind Farm, which the project is directly associated with. Nonetheless, despite being directly associated with the permitted wind farm development, the electricity substation is located c. 6km southeast of the nearest permitted turbine. The electrical control unit will be situated immediately south of the permitted turbine array. However, the likelihood of any notable cumulative effects is limited and heavily localised due to the scale of the electrical control unit and due to the high degree of screening in its near surroundings, which results in very little actual visibility of the structure. Indeed, whilst the underground electricity line directly links the permitted wind farm to the electricity substation; once operational, there will be little evidence of the interconnecting infrastructure, and thus, there will be a limited likelihood of any cumulative landscape and visual effects being generated.

Therefore, it is assessed that cumulative construction phase effects are limited and are not likely to be significant; while any operational phase cumulative landscape and visual effects are likely to be generated only with the electricity substation and interface masts.

In terms of cumulative landscape effects, the subject project and permitted wind farm will result in an increased intensity of development in the surrounding local landscape. However, due to the considerable distance between the principal built aspect of the project (the substation), there is limited likelihood of any notable in-combination effects on the surrounding landscape character. Indeed, the project and permitted development will likely be viewed as entirely separate developments.

With regard to cumulative visual effects, the considerable distance between the electricity substation will also diminish the likelihood of any clear cumulative visibility of the permitted development and subject project. Furthermore, as noted in the visual impact appraisal above, there will be very limited visibility of the electricity substation, even from its nearest surroundings. It is important to note that, from analysis of the ZTV maps prepared in respect of the permitted White Hill Wind Farm, a broad area of no wind turbine visibility (no colour pattern) exists at the electricity substation site and its environs (see **Figure 9.7** below). In terms of the electrical control unit, there will be little

clear residual visibility of the structure due to the surrounding layers of intervening screening. Accordingly, it is assessed that there is no likelihood of significant cumulative visual effects with the permitted White Hill Wind Farm.

Having regard to the assessment of likely landscape and visual effects, it is assessed that there is no likelihood of significant effects arising with other existing, permitted and proposed developments including those listed at **Chapter 1**.

Overall, it is assessed that the project will only generate very localised landscape and visual effects and will be heavily screened even from the nearest surrounding receptors. As a result, it is assessed the project will have no notable cumulative landscape or visual effects in respect of other permitted or proposed developments within the study area. Thus, the project will not result in significant cumulative effects.

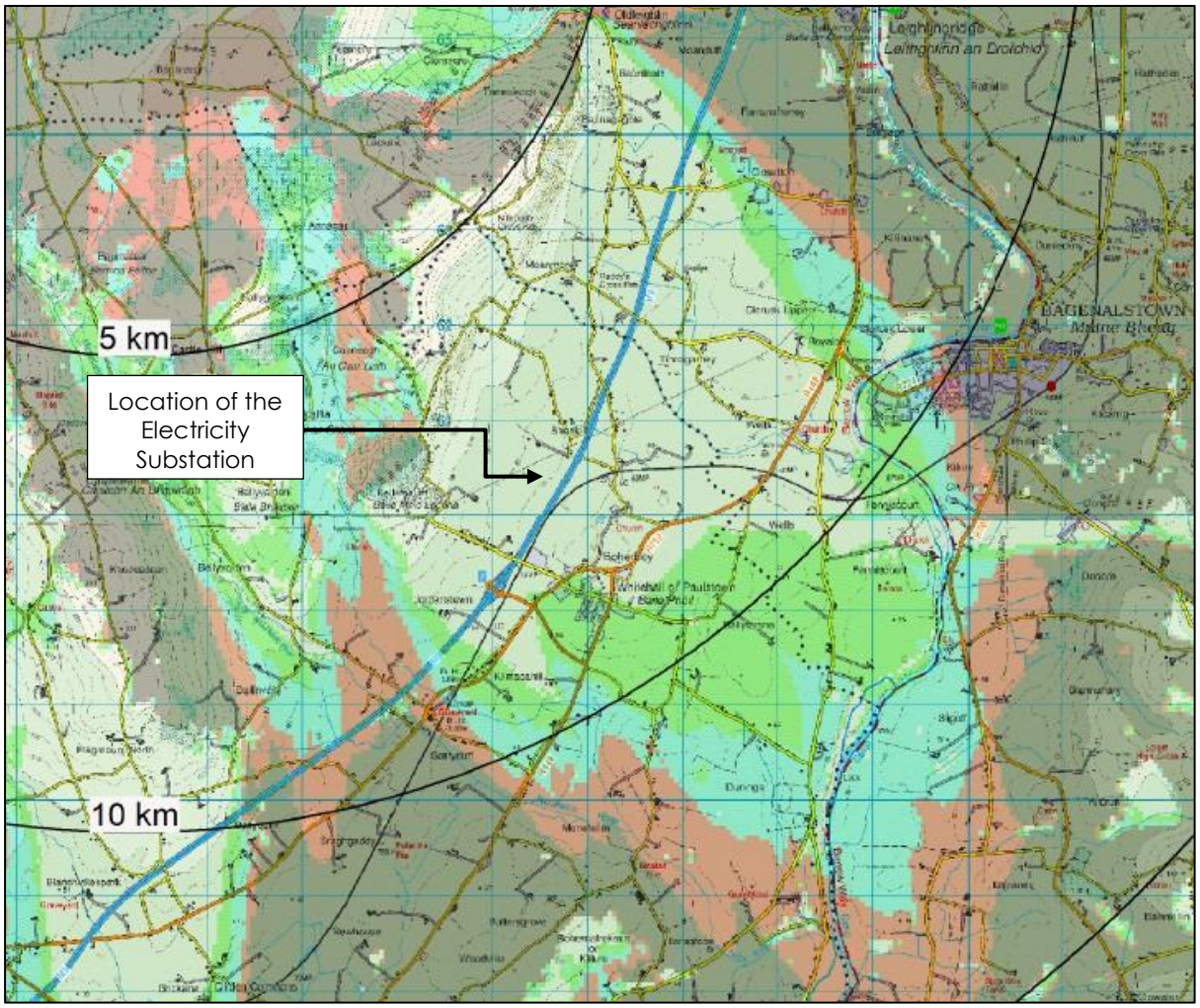

Figure 9.7: Excerpt from the ZTV maps[1] of the permitted White Hill Wind Farm

9.5 Mitigation Measures

The main mitigation measure employed in this instance is mitigation by avoidance. As part of the design process, detailed consideration was given to the appropriate siting of the project to ensure that it would be located in a robust rural area capable of absorbing it and where it would not be prominent. The overall site design also sought to maximise, to the greatest possible degree, the retention of existing field boundaries

[1] Figure 145 of Annex 9.1 (Volume II) of the White Hill Wind Farm EIAR

within the site and bordering the site to avoid a sense of ambivalence, to aid visual screening, and maintain the existing field pattern.

In addition, planting is proposed around the perimeter of the electricity substation through the planting of new hedgerows and bolstering and strengthening of existing hedgerows.

9.5.1 Construction Phase

Aside from standard construction phase measures to minimise land and vegetation disturbance (such as delineating the works area) and dust emissions (through damping down of access tracks if necessary), no specific landscape and visual mitigation measures are to be implemented. The appropriate management and reinstatement of excavations promptly will ensure that any adverse effects caused, for example, at the site entrance or along the route of the underground electricity line, are minimised insofar as possible.

Similarly, the progressive reinstatement and landscaping of the project site will remediate any short-term adverse effects on the local landscape. As part of the reinstatement and landscaping process, the planting of hedgerows will also be completed at the electricity substation and electrical control unit locations.

9.5.2 Operational Phase

Whilst some sections of hedgerow will be removed to facilitate the electricity substation compound, access tracks and site entrnaces, existing hedgerows will be maintained and protected insofar as possible.

In addition to retaining the existing hedgerows around the electricity substation site, it is also proposed to bolster existing perimeter and most internal hedgerows with under-planting and inter-planting of whip transplants (i.e. Hedgerow Type 1 - see **Figure 9.8** below) in order to ensure dense and consistent screening of the site in perpetuity. The bolstering will be undertaken where required to thicken and fill gaps in the existing hedgerow network

Advanced nursery stock in the form of 8-10cm girth trees will be used to fill any noticeable gaps and plant species will be selected to complement the existing broadleaf hedgerow species mix around the site and will be of local provenance. Where not already exceeded by existing vegetation, it is intended to manage hedgerows up to 3-4m in height. This height will be achieved by a combination of allowing lower sections of existing hedgerows to mature, filling obvious gaps with advanced nursery stock and providing an additional line of whip planting to selected hedgerows that require densification. Refer to **Annex 9.2** (**Volume II**) for further details.

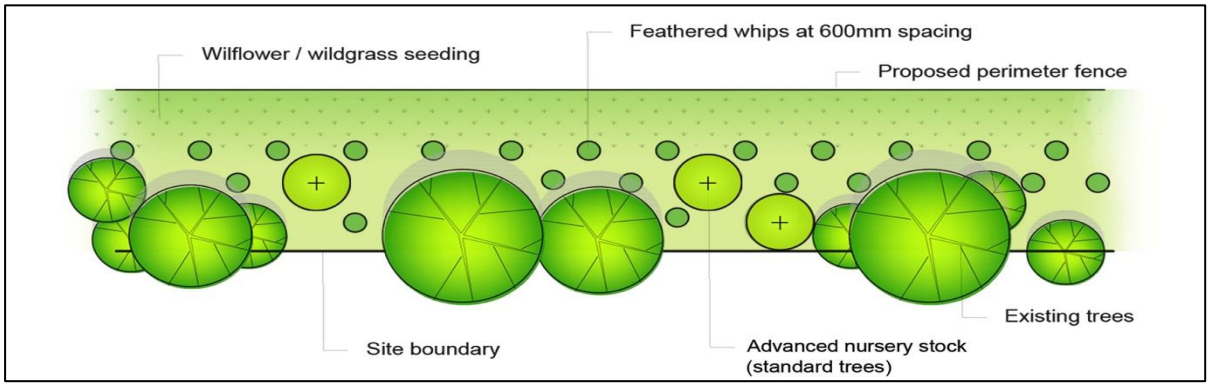

Figure 9.8: Hedgerow Type 1

It is also proposed to plant new 'Type 2' hedgerows (**Figure 9.9** refers) with whips and a high proportion of advance nursery stock trees (c. 3m planted height), in select locations to increase screening of adjacent residences and define the site boundaries where these are not exiting field boundaries. The planting will be allowed to mature up to a maintained height of 3-4m to aid in the screening and softening of the project from nearby dwellings and the surrounding road network.

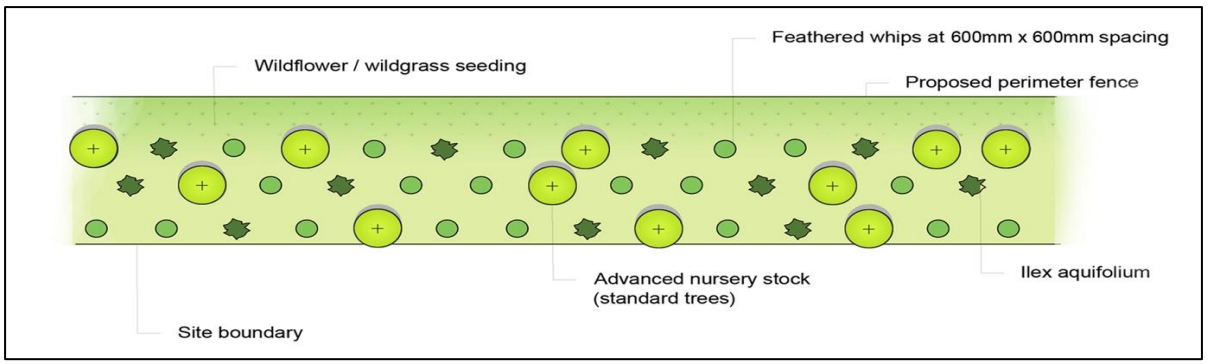

Figure 9.9: Hedgerow Type 2 Indicative boundary planting detail showing the introduction of new boundary hedgerow

9.5.3 Decommissioning Phase

Following the decommissioning of the electrical control unit and the electricity line, all excavated or disturbed areas will be soiled over and re-seeded or allowed to vegetate naturally.

9.6 Residual Effects

In terms of landscape effects, the project is contained in a relatively robust rural area that is already influenced by numerous anthropogenic built features, including major route corridors, exiting overhead cable corridors and an existing quarry. Indeed, the electricity substation compound and interface masts are located in a heavily contained part of the landscape, which considerably diminishes the likelihood of generating any notable effects on the perceived character of the surrounding landscape.

The robust and modified nature of the study area is further reflected in the current *Kilkenny City & County Development Plan 2021-2027*, where the site is not located in any of the more susceptible 'areas of greater sensitivity' nor is it located in areas classified as "areas of highly scenic and significant visual amenity value". Furthermore, much of the landscape within the study area in County Carlow is contained within the Killeshin Hills LCA, which is described as "*almost entirely a rural agricultural landscape with a moderate level of sensitivity and moderate potential capacity to absorb different types of development*".

Overall, the significance of operational phase landscape effects is deemed no greater than Moderate-Slight within the site and will reduce to Slight beyond the immediate site context, where it will be heavily screened by the layers of intervening vegetation. The quality of effect is deemed Negative, and the duration of effect is classified as permanent.

With regard to decommissioning phase effects, the electricity substation will remain as part of the national electricity network. Thus, decommissioning effects principally relate to the electrical control unit and underground electricity line. The significance of decommissioning phase effects is assessed to be no greater than Slight-imperceptible, whilst the quality of effect is assessed to be Positive.

Visual effects have been assessed at 6 no. viewpoints throughout the immediate and wider landscape context, representing various viewing distances, angles and receptor types. Indeed, some of the most sensitive and visually susceptible parts of the study area are associated with elevated lands in the western extent of the study area that afford broad views across the wider lowland landscape. The study area also encompasses a notable heritage asset which results in a localised heightened receptors sensitivity in its immediate vicinity. Otherwise, visual receptors within the study area tend to vary between Medium-low and low, highlighting the robust nature of this landscape context, which is influenced by numerous utilitarian features.

Overall, the highest residual significance of visual effect is assessed to be Slight-imperceptible (VP2), whilst the quality of effect is assessed as Neutral and the duration of effect as permanent. This is related to the nearest visual receptor to the project, which is a local residential dwelling situated north of the site. Nevertheless, this receptor will have very limited visibility of the project due to the high degree of existing vegetation in the direction of the electricity substation and interface masts, which will be further supplemented with new and enhanced areas of planting as part of the mitigation strategy. Otherwise, all other visual receptors within the study area are classified with a residual visual effect of Imperceptible, further reflecting the limited visibility and heavily contained nature of the electricity substation site.

Overall, it is assessed that the project will not generate significant residual landscape or visual effects.

9.7 Summary

Based on the assessment undertaken, the project is not assessed as likely to give rise to any significant effects. Landscape effects are not assessed as likely to exceed 'Moderate-slight' significance, even in the immediate context of the site and residual visual impacts/effects are not assessed as likely to exceed 'Slight-imperceptible' significance.