macroworks

LANDSCAPE & VISUAL IMPACT ASSESSMENT

Drumdowney SID

County Kilkenny

Prepared by Macro Works Ltd on behalf of Drumdowney Solar Farm Ltd

November 2025

LVIA I TVIA I Landscape Design I Visibility Analysis I Glint and Glare I Verified Photomontages I CGI I Shadow Flicker Analysis

This LVIA should be read in conjunction with the LVIA Photomontages produced by Macro Works Ltd

Registered Landscape Architect

1. LANDSCAPE AND VISUAL IMPACT ASSESSMENT

1.1 INTRODUCTION

This Landscape and Visual Assessment (LVIA) has been prepared to accompany a planning application for a 110kV Gas Insulated Switchgear (GIS) electricity substation and grid connection in the townland of Rathpatrick in County Kilkenny.

For clarity, it should be noted that the terms 'proposed development' and 'proposed substation and grid connection' are interchangeable in this report and, where contextually relevant, references are also made to the proposed Drumdowney Solar Farm which is located north and south of the proposed substation. It should be noted that electricity generated on this solar farm will be transmitted on to the national electricity grid via the proposed substation and grid connection.

This LVIA describes the landscape context of the proposed substation and grid connection development and , given its proximity, the proposed Drumdowney Solar Farm and assesses the likely landscape and visual impacts of the scheme on the receiving environment. Although closely linked, landscape and visual impacts are assessed separately.

- Landscape Impact Assessment (LIA) relates to assessing effects of a development on the landscape as a resource in its own right and is concerned with how the development will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive 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).

1.1.1 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) publication entitled Guidelines for Landscape and Visual Impact Assessment, 2013 (GLVIA3);
- Environmental Protection Agency (EPA) publication 'Guidelines on the Information to be contained in Environmental Impact Statements (2022); and
- 'Photography and Photomontage in Landscape and Visual Impact Assessment', Landscape Institute Technical Guidance Note 06/2019.

This LVIA was prepared by Macro Works Ltd of Cherrywood Business Park, Loughlinstown, Dublin 18; a consultancy firm specialising in Landscape and Visual Assessment and associated maps and graphics. Macro Works' relevant experience includes a broad range of infrastructural, renewable energy including 150+ Solar Farm developments along with industrial and commercial projects, numerous urban, residential, and mixed use development since 1999.

1.1.2 Description of the Proposed Development

The proposed development comprises of:

- A 110kV Gas Insulated Switchgear (GIS) electricity substation with two-storey GIS substation building, single-storey Independent Power Producer (IPP) control room building, High Voltage (HV) electrical

equipment and associated infrastructure (to include transformer, lightning protection masts, back-up diesel generator, fire/blast wall, telecoms pole, perimeter security fencing, security lighting, water and drainage infrastructure, and temporary construction compound) to connect to and serve a solar farm;

- Associated loop-in / loop out infrastructure to connect into an existing 110kV overhead transmission line (including underground 110kV cabling, 2 No. new interface towers and decommissioning of ca. 15m of existing 110kV overhead line);
- Construction and operational access from the public road L34142;
- All ancillary site development, landscaping and earthworks. The development subject to this application forms part of grid connection and access arrangements which will facilitate the connection of the proposed Drumdowney Solar Farm (Kilkenny County Council Reference 25/60391) to the national grid. A Natura Impact Statement (NIS) has been prepared in respect of the proposed development. The NIS includes consideration of the proposed Drumdowney Solar Farm which is located in the townlands of Ataeemore or Blackneys, Ballyhobuck, Ballyrahan, Carriganurra, Charlestown, Davidstown, Drumdowney Lower, Drumdowney Upper, Gorteens, Grogan, Kilmurry, Nicholastown, Rathpatrick, Scartnamoe, Tinvaucoosh and Treanaree in County Kilkenny.

The operational lifetime of the solar farms is assumed to be 40 years. However, following the decommissioning of the solar farm, it is envisaged that the substation and grid connection will remain in situ as a valuable functioning and operational part of the electricity transmission network managed by the Transmission Systems Operator, EirGrid.

1.2 METHODOLOGY

This document uses methodology as prescribed in the previously mentioned GLVIA3, which follows the European Landscape Convention (ELC) definition of landscape:

> *'Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors' (Council of Europe, 2000). Thus, GLVIA-2013 covers all landscapes from "high mountains and wild countryside to urban and fringe farmland (rural landscapes), marine and coastal landscapes (seascapes) and the landscapes of villages towns and cities (townscapes)" - whether protected or degraded.*

1.2.1 Scope of the Assessment

GLVIA3 establishes guidelines and not a specific methodology. The preface recognises that:

> *'This edition concentrates on principles and processes. It does not provide a detailed or formulaic 'recipe' that can be followed in every situation – it remains the responsibility of the professional to ensure that the approach and methodology adopted are appropriate to the task in hand.'*

The methodology for this assessment has therefore been developed specifically for this assessment to ensure that it is appropriate and fit for purpose. The LVIA Methodology can be summarised as undertaking the following key tasks:

- Desk study and site visits in May and October 2025;
- Defining the Baseline Landscape setting and conditions;
- Identification and Evaluation of key components of the proposed development;
- Consideration of Mitigation Measures;
- Assessment of Landscape Effects;
- Assessment of Visual Effects; and
- Summary Statement of Significance.

1.2.2 Study Area

From similar studies, it is predicted that the proposed development and wider solar farm is likely to be difficult to discern beyond approximately 5km and is not likely to give rise to significant landscape or visual impacts beyond approximately 2km. In the interests of a comprehensive appraisal, a 5km radius study area is used in this instance for the entire project comprising both the proposed development and the solar farm. However, there will be a particular focus on receptors contained within 2km, except where iconic or designated scenic viewpoints exist at greater distances out to 5km (refer to Figure 1.1). A study area of 5km has typically been used for solar projects in Ireland, Northern Ireland and Great Britain and this approach has been deemed acceptable by multiple planning authorities including Kilkenny County Council and An Coimisiún Pleanála. In the context of the proposed 110kVsubstation and grid connection which is the subject of this application to An Coimisiún Pleanála the 5km study area is considered conservative as the development area is of significantly smaller geographical scale than the associated solar farm.

Figure 1.1 5km Extent of the Study Area

1.2.3 Landscape Impact Assessment Criteria

This part of the LVIA provides an assessment of how the introduction of the proposed development will affect the physical features and fabric of the landscape, and then how the proposals 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 potential landscape effects of the development, 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.

1.2.3.1 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 following criteria set out in Table 1.1.

Table 1.1 Landscape Value and Sensitivity

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.

1.2.4 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 proposed development 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 1.2 outlines criteria used to inform this judgement.

Table 1.2 Magnitude of Change – Landscape

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.

1.2.5 Visual Impact Assessment Criteria

This part of the LVIA provides an assessment of how the introduction of the proposed development will affect views within the landscape. It therefore needs to consider:

- Direct impacts of the proposed development 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.

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 proposed development. The selected viewpoints are considered to be comprehensive in communicating the variable nature of the visual effects.

When assessing the potential 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.

1.2.5.1 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.

1.2.5.2 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;
- 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;
- 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".

1.2.5.3 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;
- Sense of awe. This considers whether the view inspires an overwhelming sense of scale or the power of nature.

Those locations which are deemed to satisfy many of the above criteria are likely to be of higher sensitivity, and no relative importance is inferred by the order of listing.

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.

1.2.6 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 proposed development. 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 proposal is within a particular view. Aside from the obvious influence of scale and distance, a development'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 in Table 1.3.

Table 1.3 Magnitude of Change – Visual

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.

1.2.7 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 it is not noteworthy.

The significance category judgement is arrived at using the Significance Matrix at Table 1.4 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, 10th June 2013)).

Indicative criteria descriptions used in relation to the significance of effect category are presented at Table 1.5.

Table 1.4 Significance Matrix

	Sensitivity of Receptor				
Magnitude	**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 1.5 Indicative significance of effect criteria descriptions

	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.	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the visual environment.

	There are notable changes in landscape characteristics over a substantial area or an intensive change over a more limited area.	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 landscape context, character or features.	An effect capable of measurement but without noticeable consequences. Although the development may be visible, it would be difficult to discern resulting in minimal change to views.

It is important that the likely effects of the proposals are transparently assessed and understood in order that the determining authority can bring a balanced, well-informed judgement to bear when making a planning decision.

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) 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.

1.2.8 Quality of Effects

In addition to assessing the significance of landscape and visual effects, the quality of the effects is also determined. Within this LVIA, effects are described as negative/adverse, neutral, or positive/beneficial, and the following criteria has been used to guide these judgements.

- Positive/beneficial - A change which improves the quality of the environment, enhancing the existing view/landscape;
- Neutral - No effects or effects that are imperceptible, within normal bounds of variation e.g. will neither detract from nor enhance the existing view/landscape;
- Negative/adverse - A change which reduces the quality of the environment, detracting from the existing view/landscape.

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 to be positive / beneficial. Effects in these contexts are generally considered to be adverse in nature, or neutral, where the effect has little influence on the landscape/views.

1.3 LANDSCAPE AND VISUAL POLICY CONTEXT AND DESIGNATIONS

1.3.1 Kilkenny County Development Plan 2021-2027 - Landscape Character Assessment

A Landscape Character Assessment was completed for County Kilkenny and is included within the current Kilkenny County Development Plan. This divides the landscape of County Kilkenny into four Landscape Character Types (LCTs) and 14 geographically specific Landscape Character Areas (LCAs). This separates the county into four specific landscape character types (LCTs) (Figure 1.2). In terms of landscape character types, the proposed substation development is entirely contained within the 'Upland Areas' LCT. In terms of the wider solar farm development, parcel one, two and four are entirely contained within the 'Upland Areas' LCT, whilst parcel three, the westernmost parcel, is contained within the 'Lowland Areas' LCT. In addition, due to the proximity of parcel 4 to the River Barrow, this parcel also closely borders a 'River Valley' LCT.

There are several policies relating to the three LCTs identified above which are relevant to the proposed development;

Upland Areas

"Policy 1 - Ensure that development will not disrupt disproportionately the integrity of distinctive primary ridgelines when viewed from relevant scenic routes and settlements.

Policy 2 - Ensure that development will not have a disproportionate visual impact (due to excessive bulk, scale or inappropriate siting) and will not significantly interfere or detract from scenic upland vistas, as identified in the Development Plan, when viewed from areas nearby scenic routes or settlements."

Lowland Areas

"Policy 11 - Continue to permit development that can utilise existing infrastructure, whilst taking account of local absorption opportunities provided by the landscape and prevailing vegetation."

River Valleys

"Policy 13 - Direct new development whenever possible towards the vicinity of existing structures and mature vegetation.

Policy 14 - Ensure that development will not detract from scenic vistas, especially from bridges, as identified in the development plan, and visible from relevant scenic routes and settlements

Policy 15 - Continue to permit development that can utilise existing structures, settlement areas and infrastructure, whilst taking account of the visual absorption opportunities provided by existing topography and vegetation."

In terms of the proposed development, it is entirely contained within the LCA E - 'South Eastern Hills/Uplands'. The wider solar farm development is situated across two LCAs with parcels one, two and four (i.e. the three easternmost parcels) contained within LCA E - 'South Eastern Hills/Uplands', which is described as being *"characterised by open undulating lands with regular (medium sized) field patterns, where some rock outcrops occur"*. Parcel three is contained within the easternmost extent of LCA G - 'South Kilkenny Lowlands', described as having "*open lands with regular (medium sized) field patterns. Medium sized hedgerows act as field boundaries where few trees can also be found. Rock outcroppings are a feature of this area*". Again, due to proximity to the River Barrow, parcel four also borders LCA J - 'The Suir Valley', described as "*a wide and fertile valley, traditionally associated with dairying and more recently with fruit and horticultural nursery sectors*".

The current Kilkenny CDP identifies 'landscape areas of highly scenic and significant visual amenity value', in particular Brandon Hill Uplands and the River Valley Areas of the Rivers Nore, Barrow and Suir have been identified as being highly scenic and visually pleasing, and as having significant visual amenity value and tourism potential within the county. The proposed development is well setback from this designation. Nonetheless, parcel four borders the river valley areas of the Suir and Barrow. The CDP sets out the following Development Management Requirement for these scenic areas:

"*To ensure that development within the Landscape Character Areas of Brandon Hill Uplands and the River Valleys of the Nore, Barrow and Suir, which are highly scenic and visually pleasing, and of significant visual amenity value, are carefully sited and designed and can be successfully assimilated into the landscape*."

Landscape sensitivity within County Kilkenny is dealt with by 'areas of greater sensitivity'. These are "*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*". Areas of greater sensitivity that fall within the study area include scattered pockets of gently and moderately steep areas, inland marshes toward the norther and western portions of the study area generally along the River Suir and River Barrow corridors, intermittent patches of broad-leaved forest and mixed forest, and three identified ridgelines which occur within the northern half of the study area. With regard to the proposed substation development, none of these 'areas of greater sensitivity occur within the immediate context of the substation development.

The current County Development Plan also sets out a number of 'development management requirements', some of which relate to the proposed development and wider solar farm and are included 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 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.

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 proposed development can be assimilated into the landscape and will not have a disproportionate visual impact on the landscape."

Figure 1.2 Excerpt from the current Kilkenny CDP showing landscape types in relation to the proposed substation development (red line). Dark Green Colour - 'Upland Areas' , Light Green Colour - 'Lowland Areas'.

Kilkenny County Development Plan 2021-2027 - Chapter 11 - Kilkenny Renewable Energy Strategy

A renewable energy strategy is included within Chapter 11 of the current Kilkenny CDP. Section 11.6 relates to solar energy and considers the solar energy resource in County Kilkenny, describing the resource and the associated energy conversion technologies. Section 11.6 includes a section outlining the best locations for Utility Scale Solar PV (USSPV), which are:

- Proximate to a 38kV or 110kVv lines and substations
- Rural Brownfield (e.g. cutaway bog);
- Urban Brownfield (e.g. former landfill sites);
- Topographically assimilative and screening rich landscapes; and
- Agricultural Lands.

1.3.2 Wexford County Development Plan 2022-2028 - Landscape Character Assessment

The eastern periphery of the study area (but not the extents of the planning application boundary) enters County Wexford, therefore the Wexford CDP is included here for completeness. A Landscape Character Assessment has been prepared for County Wexford and this is incorporated as Volume 7 of the current Wexford County Development Plan 2022-2028. The Landscape Character Units 'River Valley' and 'Lowlands' occur within the study area, and are respectively rated as having a moderate-high and low-moderate landscape sensitivity rating. The current Wexford County Development Plan also outlines 'Landscapes of Greater Sensitivity' however, none of these areas are contained within the study area.

1.3.3 Waterford County Development Plan (CDP) 2022-2028 - Landscape Character Assessment

The southern periphery of the study area (but not the extents of the planning application boundary) enters County Waterford, therefore the Waterford CDP is included here for completeness. Chapter 10 of the Waterford CDP 2022-2028 identifies 7 Landscape Character Types (LCT's): coastal landscapes, river corridor and estuary landscapes, farmed lowland landscapes, foothill landscapes, upland landscapes and urbanising landscapes. These LCT's are then further characterised into Landscape Character Units (LCU's). The LCU's that fall within the study area are; LCA 2C - East Waterford Lowlands, LCA 4B - Suir Estuary, and LCA 7a - Waterford City and Environs. The CDP identifies 'landscape sensitivities' with the river valley area of the Suir being classed as 'most sensitive' and the other areas within the study area being deemed as least or low sensitivity as they are often heavily influenced by the wider surroundings of Waterford City and its urban land uses.

1.3.4 Views of Recognised Scenic Value –Kilkenny County Development Plan

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

All scenic designations within the study area that are relevant to the proposed development (i.e. have views oriented to the proposed development and are within the Zone of Theoretic Visibility Pattern) have been visited during fieldwork investigations. Where there is potential for visibility of the proposed development, a representative view has been included within the visual impact appraisal.

Kilkenny County Development Plan

According to 'Appendix H- List of Protected Views' of the Kilkenny CDP's Landscape Character Assessment, there is only one 'Protected View' within the study area, which is oriented in the direction of parcel 4, but not in the direction of the proposed substation and grid connection or other parcels proposed as part of the wider solar farm development:

- Scenic View V22 - "Views over the confluence of the Rivers Suir and Barrow at Snow Hill on road nos. LS7483 from its junction with road no. LP 3415 and view from road no. LT 74831-15."

Wexford County Development Plan

Views of recognised scenic value are typically indicated within County Development Plans, but neither the previous Wexford County Development Plan (2013-2019) nor the present Wexford County Development Plan (2022-2028) includes a list of designated scenic routes or views, although it should be noted that hills and ridges designated as 'landscapes of greater sensitivity' are noted for their "views across the surrounding landscape." No scenic routes, views/prospects or 'Landscapes of Greater Sensitivity' occur within the study area. The nearest 'Landscapes of Greater Sensitivity' is Slieve Coiltia (270m AOD) which is located over 10km from the proposed substation development at its nearest point.

Waterford County Development Plan

No protected views occur within the study area, however one scenic route as designated within the current Waterford CDP (2022-2028) passes through the southern portion of the study area, on the southern bank of the River Suir, namely Scenic Route 15 - "*South-east from Waterford City on the R683 to Mount Druid. South along the R684 to Belle Lake and east on third class road via Woodstown to Waterford Harbour. North to Passage East along the Harbour, continuing north towards Cheekpoint. South at junction to R683 and west to Waterford City*."

1.4 EXISTING ENVIRONMENT

1.4.1 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 proposed development will be assessed. A description of the landscape context of the proposed substation development, wider solar farm and wider 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 proposed development. The visual resource will be described in greater detail in **1.4.2**.

1.4.1.1 Landform and Drainage

The site of the proposed development and its immediate study area comprises a mix of flat to low rolling terrain in the southeast of County Kilkenny, northeast of Waterford City and west of the Wexford border. The proposed substation development is located to the southwest of the N29 and N25 intersection and is located along a low rolling hill at an elevation of between 80-90m AOD. The wider solar farm development is broadly located on localised areas of slightly elevated land.

Beyond the immediate context of the site, there are some more notable undulations in the terrain. Towards the northern and north-western portions of the study area and in the wider landscape, elevations increase towards the Castlecomer Plateau, which is situated in the wider landscape to the northwest and forms a backdrop to many of the views oriented to the north within the study area. The River Suir and River Barrow are the principal watercourses within the study area, with the Suir located some c. 3 km to the south of the substation compound and the Barrow located some c. 3 km to the east. These watercourse both form distinct valleys in the surrounding terrain and are some of the more notable natural land froms within the study area.

Figure 1.3 Landscape Context of the central study area

1.4.1.2 *Vegetation and Land Use*

The predominant land use within the site, central study area, and wider landscape is a mix of large to medium-sized pastoral fields, bounded by networks of mixed hedgerow vegetation and intervening mature trees. Nonetheless, while typical rural and pastoral land uses are the dominant land cover type, the study area also includes a notable mix of highly anthropogenic land uses, predominantly within the southern half of the study area associated with the wider surrounds of Waterford City. The most prominent anthropogenic land use is Belview Port (Port of Waterford) and its surrounding commercial infrastructure, with the nearest industrial building located approximately 500m from Parcel 4 and just over 1.3 km south of the proposed substation. Belview Port is a major Irish port and serves as a multi-modal hub, integrating shipping, road, and rail freight. The port handles various types of cargo, including containerized cargo, liquid bulk, bulk, and break bulk. In addition, there is a fringe settlement—Ferrybank—in the south-eastern portion of the study area, with the peripheries of Waterford City lying just within the 5km study area and extending beyond it. The southern extent of the study, especially in the surrounding context of the confluence of the River Barrow and River Suir also encompasses some large-scale highly anthropogenic development. Great Island Power Station which consists of a 220 kV substation, Combined Cycle Gas Turbine (CCGT), Converter Station and Interconnector substation. Numerous overhead cable corridors emanate from this development, several of which cross the Barrow to the north of Great Island Power Station and traverse lands in the surrounds of the proposed development.

The N25 national road corridor is the primary transport route within the study area, traversing in a south-westerly direction and connecting New Ross and Waterford City. The N29 passes through the study area as well, forking from the N25 as it begins to bypass Waterford City and serving as a connection between Belview Port and the wider national road network. The national railway line is another notable linear land use within the study area, with the operational rail line beginning near Ferrybank and extending in a northerly direction. A section of railway is also present within the southern half of the study area, which is under consideration for redevelopment as a greenway route; this passes Parcel 4 at a distance of approximately 50m at its nearest point.

Small blocks of conifer forest are scattered throughout the wider landscape, primarily within the northern portion of the study area, while linear swathes of riparian woodland typically cloak the corridors of the main rivers within the area.

1.4.1.3 *Centres of Population and Housing*

The principal centre of population within the study area is Waterford City, the outskirts of which begin just over 3km southwest of the proposed substation and grid connection. The nearest notable settlement to the proposed development is Ferrybank, a fringe settlement on the outskirts of Waterford City and its surrounding area. The small village of Slieverue is the nearest settlement to the proposed development and is located less than c. 500m to the southwest of the site. The small coastal village of Cheekpoint is located directly south of the Parcel 4 and some 4.6km southeast of the proposed substation development. Aside from these, the immediate surroundings of the site within the study area comprise a modest rural population, primarily made up of linear clusters of dwellings and isolated farmsteads.

1.4.1.4 *Transport Routes*

The primary transport route in relation to the proposed development is the N25, which runs in a south-westerly direction through the centre of the study area and just over some c. 200m to the north of the substation. The nearest major route to the substation development is the N29 national route, which passes directly west of the site and connects to Belview Port in the southern half of the study area.

The nearest regional road corridor to the proposed development is the R711, which traverses the southern portion of the study area, diverging southwest from the N29 some c. 500 m from the proposed substation development. Several other regional roads also converge at the settlement of Waterford City in the south-western extent of the study area. Aside from these major routes, the study area also contains a dense network of interconnecting local roads, several of which pass adjacent to the proposed substation and wider solar farm.

1.4.1.5 Tourism, Heritage and Public Amenities

Numerous sporting and cultural amenities are located within and surrounding Waterford City, towards the south-western portion of the study area, while amenity features in the northern portion of the study area are limited to local walking trails. A local woodland walking trail at Tory Hill is situated in the wider northern area of the study area, looping around the hill and peaking at a religious memorial located on the hillside.

In the sporting and outdoor domain, amenities associated with Waterford City include Waterford GAA Grounds, Ferrybank Sports Ground, Williamstown Golf Club, Waterford Golf Club, and Waterpark Rugby Club. Additionally, there is a marina and jetty for recreational boating along Merchants Quay (i.e. the south bank of the River Suir, within the city centre), as well as access to the Waterford–Dungarvan Greenway. Numerous historic, cultural, and tourist attractions are located within the city, including the Viking Triangle and Reginald's Tower.

Towards the southern portion of the study area, two renowned golf courses are located on the southern banks of the River Suir: Waterford Castle Hotel & Golf Resort, approximately 3.6km south-west of the proposed substation, and Faithlegg Golf Club, approximately 3.6km to the southeast.

1.4.2 Visual Baseline

Only those parts of the receiving environment that potentially afford views of the proposed development are of concern to this section of the assessment. The solar farm is excluded except in terms of the cumulative visual impact assessment which is presented in Section 1.7 below. A comprehensive visual baseline and impact assessment is provided in its respective planning application to Kilkenny County Council (25/60391). A computer-generated Zone of Theoretical Visibility (ZTV) map has been prepared to illustrate where the proposed development is potentially visible from. The ZTV map is based solely on terrain data (bare ground visibility), and ignores features such as trees, hedges or buildings, which may screen views. 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 proposed development will definitely not be visible, due to terrain screening within the 5km study area.

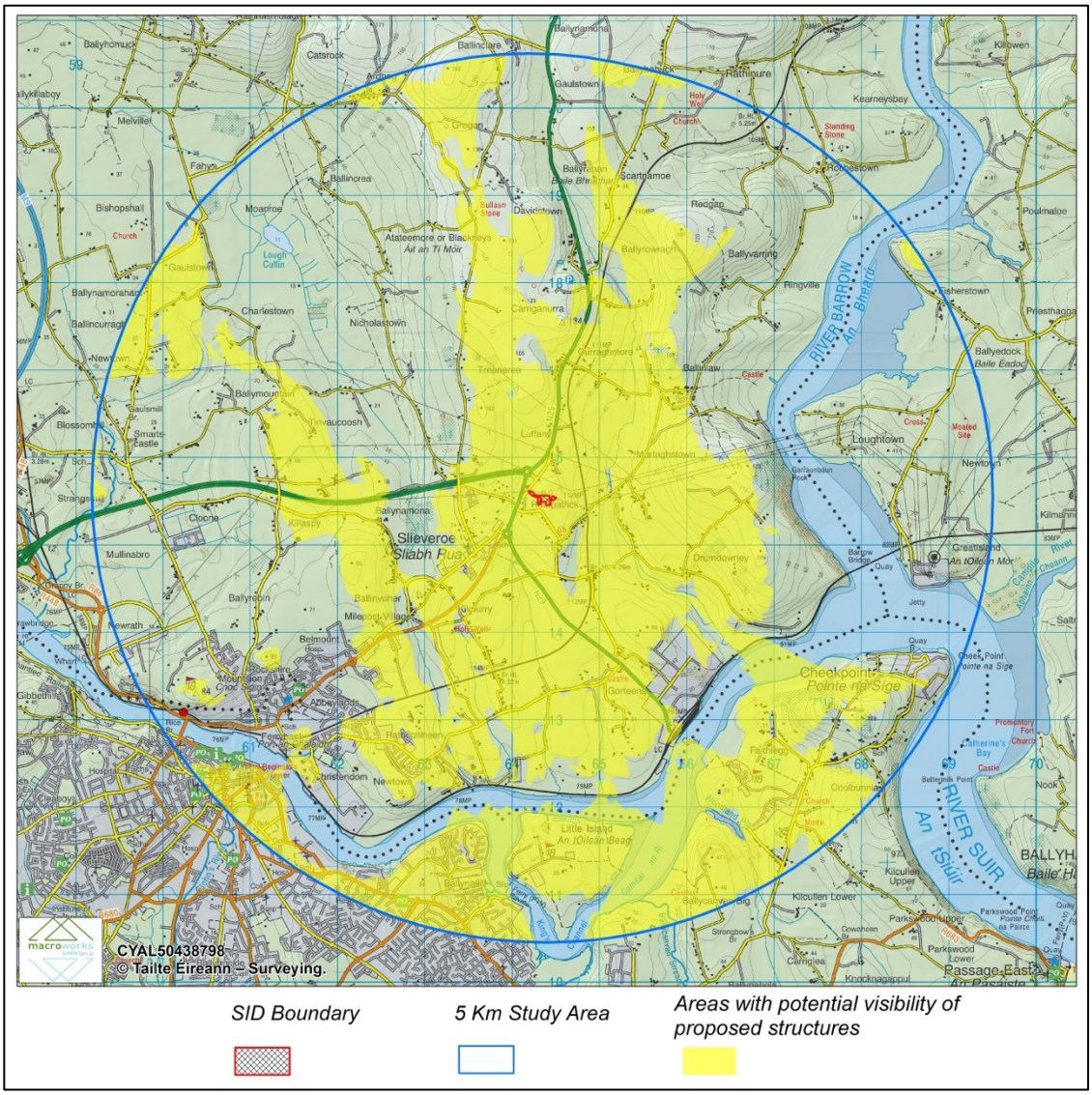

Figure 1.4 Standard (bare-ground) ZTV map

The following key points are illustrated by the 'bare-ground' ZTV map (see Figure 1.4 above):

- The proposed substation development and grid connection has the potential to be visible through a notable extent of the central and wider study area due to its location along a locally elevated hill.
- The proposed development has the potential to be visible throughout much of the immediate surrounding landscape, however both east and west of the development visibility pattern tends to drop off due to the surrounding rolling landforms.
- To the east, several rolling hills and ridges located to the west of the River Barrow will screen receptors within the wider eastern extent of the study area. Indeed, there will be limited potential visibility of the proposed substation development east of the River Barrow.
- Similarly to the west, several low rolling hills reduce the potential for visibility throughout the wider western extent of the study area, with visibility contained to locally elevated areas of surrounding terrain.
- To the south, visibility extents towards Cheekpoint and the urban parts of Waterford City south of the River Suir.

The most important point to make in respect of this 'bare-ground' ZTV map is that it is theoretical. Whilst some of the proposed substation buildings comprises of larger built forms as well as 2 no. interface towers, the surrounding landscape is heavily vegetated and will result in the proposed substation development being screened and softened by surrounding and intervening hedgerow vegetation, trees and numerous buildings, walls and embankments scattered throughout the study area.

1.4.2.1 *Identification of Viewshed Reference Points as a Basis for Assessment*

Viewshed Reference Points (VRP's) are the locations used to study the visual impacts of a proposed development in detail. It is not warranted to include each and every location that provides a view of a development as this would result in an unwieldy report and make it extremely difficult to draw out the key impacts arising from the proposed development. Instead, the selected viewpoints are intended to reflect a range of different receptor types, distances and angles. The visual impact of a proposed development is assessed by Macro Works 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);
- Amenity and heritage features (AH).

VRP's might be relevant to more than one category and this makes them even more valid 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 Viewshed Reference Points selected in this instance are set out in the Table 1.6 and Figure 1.5 below.

Table 1.6 Outline Description of Selected Viewshed Reference Points (VRPs)

VRP No.	Location	Representative of	Direction of view
VP1	Local road at Rathpatrick east of N29	MR, LCV	SE
VP2	L3433 at Rathpatrick (2)	LCV	W
VP3	L3414 at Rathpatrick east of Rathpatrick Cross Roads	LCV	NE
VP4	L3433 at Rathpatrick	LCV	NW

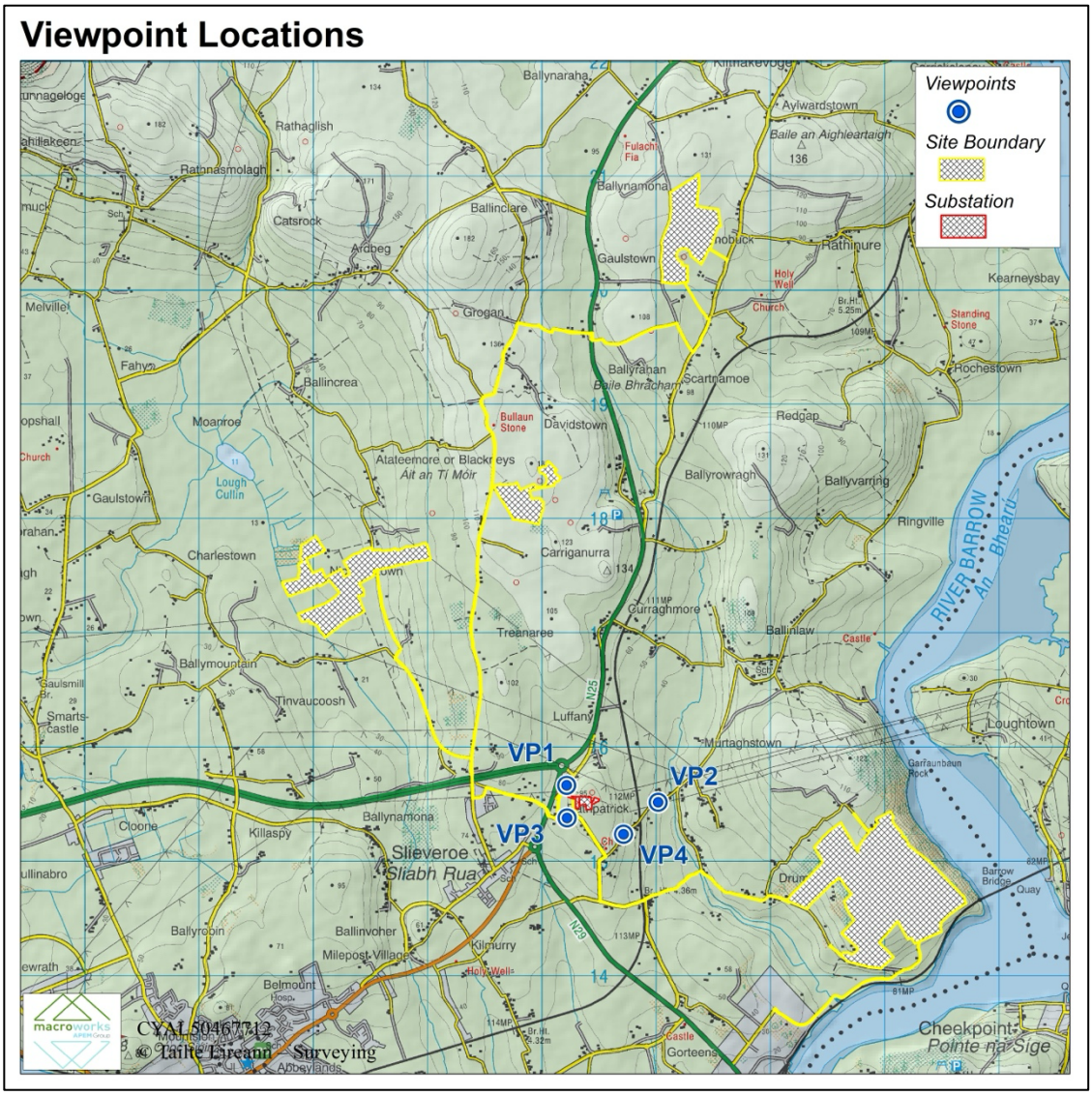

Figure 1.5 Viewpoint location map (showing viewing extents and direction of view)

1.5 MITIGATION AND RESTORATION MEASURES

The main mitigation by avoidance measure employed in this instance is the siting of the proposed development in a robust rolling rural area that is currently heavily influenced by numerous other development types, including an existing large-scale busy port complex, major route corridors and the urban settlement of Waterford City. The study area also avails of a high degree of vegetative screening, so that the proposed development will not be a highly prominent feature within the surrounding landscape. Whilst the proposed substation development is contained along locally elevated lands, it is well offset from the nearest surrounding receptors and is contained by several existing hedgerows, which aid in screening and softening the development. The proposed development is also contained along the alignment of existing overhead cable infrastructure, and thus, will not appear highly incongruous in this setting.

In addition to mitigation by avoidance measures, retention of existing hedgerow boundaries within and around the site aids visual screening, and maintains the existing field pattern. In this respect, the proposed solar farm (including the substation and grid connection) is not perceived to impose itself on the existing landscape pattern.

In addition to retaining the existing hedgerows within around the site, it is also proposed to bolster existing perimeter and internal hedgerows with under-planting and inter-planting of whip transplants (i.e. Hedgerow Type 1 - see Figure 1.6 below) in order to ensure dense and consistent screening of the site in perpetuity. This will be undertaken where required to thicken and fill gaps in the existing hedgerow network prior to the construction phase, thus allowing for any growth in the period between a grant of planning permission and construction of the development. 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. Whilst the bolstered hedgerows will not fully screen some of the larger built elements within the proposed substation development, it will visual soften the built forms of the development and screen many of the lower built forms.

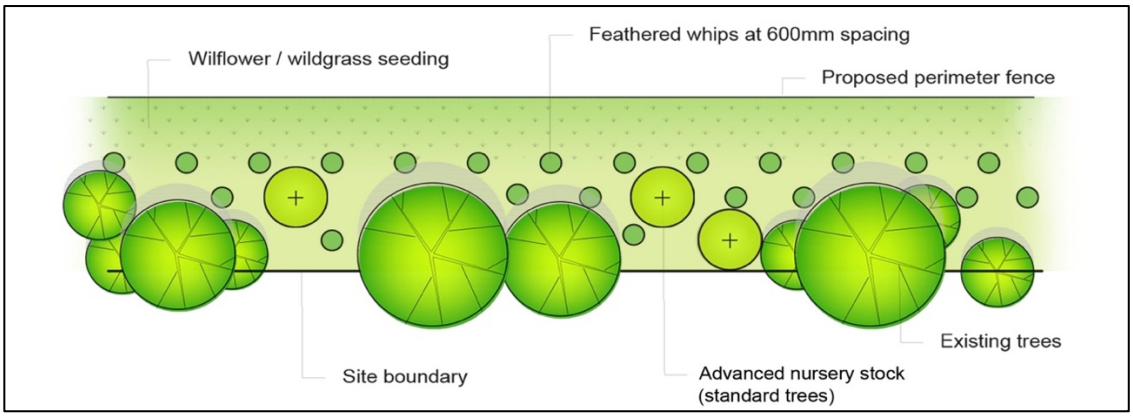

Figure 1.6 Hedgerow Type 1: indicative boundary planting detail showing the approach to inter-planting and under-planting of existing hedgerows (where consolidation is needed).

With regard to the wider solar farm development it is also proposed to retain, protect and enhance considerable sections of existing hedgerow vegetation as the 'Type 1' hedgerow above. In addition, it is also proposed to plant extensive areas of new 'Type 2' hedgerows (Figure 1.7 refers), with whips and a high proportion of advance nursery stock trees (c.3m planted height), along the boundaries of some of the proposed parcels to further screen the proposed development from some of the nearest surrounding receptors (refer to the submitted Landscape Mitigation Plan drawing package LD.DRMDWNY). All of this planting will be allowed to mature up to a maintained height of 3-4m to aid in the screening and softening of the proposed development from nearby dwellings and surrounding local, regional and national roads.

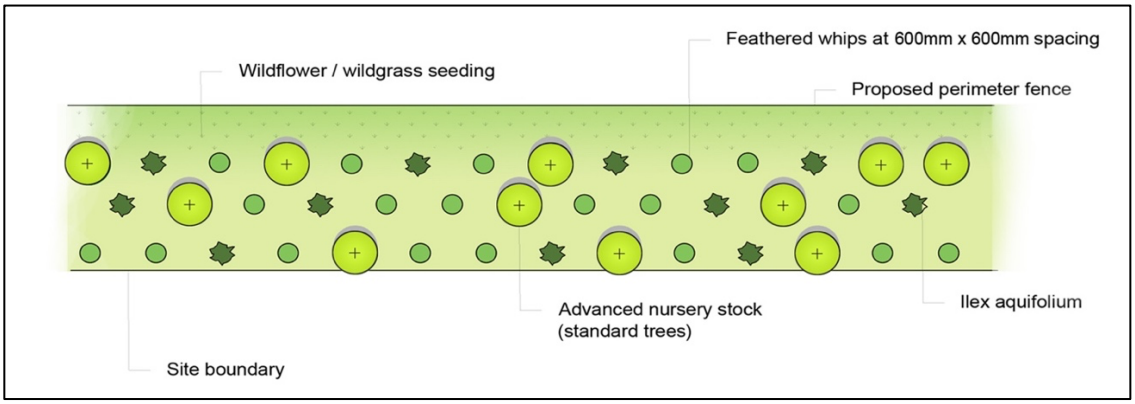

Figure 1.7 Indicative boundary planting detail showing the introduction of new boundary hedgerow TYPE 2

Furthermore, at an early stage of the design process, additional setbacks from some of the nearest residential dwellings to the proposed development and wider solar farm were included to mitigate the potential for visual impacts. However, it should be noted that very few residential receptors are located along the immediate boundary of the site. The nearest residential receptors to the proposed substation development are contained along the local road to the south at Rathpatrick and are afforded a notable degree of existing screening from both terrain and intervening vegetation.

It is also proposed to include early-stage planting within and around the site as part of the landscape mitigation proposals. It is proposed to undertake the early-stage planting during the first month of the proposed construction phase, which lasts a total of 24 months (inclusive of proposed substation and grid connection). As a result, the early stage planting will have up to two growing seasons to establish, prior to the implementation of the proposed solar panels, which will be included during at month 12 of the 24 month construction programme. Thus, once implemented, the proposed planting measures will soften and screen the proposed panels and some construction-related activities from surrounding receptors. By the time the proposed substation and solar farm construction has concluded, the proposed planting will have been in place for more than two growing seasons, allowing the advanced nursery stock and whips to slightly fill out and further screen and soften the proposed development. It is important to note that the montage view in the submitted photomontage set represents the proposed development at construction month 12 when the panels have been implemented and the proposed mitigation planting has up to two growing seasons to fill out.

1.6 IMPACT ASSESSMENT

1.6.1 Do-nothing scenario

The '*do-nothing*' impact refers to the non-implementation of the proposed development. The primary effect of this would be that the impacts and effects identified would not directly occur. In this regard the following issues are relevant. The site, which is currently 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.

1.6.2 Assessment of Receptor Sensitivity – Landscape

Landscape value and sensitivity are considered in relation to a number of factors highlighted in the Guidelines for Landscape and Visual Impact Assessment 2013, which are set out below and discussed relative to the proposed development site and wider study area.

This is a relatively robust landscape context that is primarily rural in character, albeit with some localised industrial influence from the wider surroundings of Waterford City and Belview Port, particularly in the landscape to the west of Parcel 4 and south of Parcel 3. With respect of the proposed substation site, it is notably influenced by existing overhead cable corridors, along with the major transport routes of the N29 and N25. Several large scale industrial land uses are also noted along the corridor of both major routes to the northwest of the substation site. The other surrounding parts of the study area remain predominantly rural in character, with lower population densities. Indeed, in these parts of the study area, the main landscape values relate to the sustenance of the rural economy, rather than any highly sensitive landscape qualities associated with scenic or recreational amenity, or a sense of naturalness. The River Suir and River Barrow corridors offer a contrast to the more typical rural lands, being defined by more distinctive valley landforms and often cloaked in dense surrounding vegetation.

Nonetheless, these areas are also shaped by human activity and characterised by highly anthropogenic land uses. Belview Port, to the south of the substation site, presents a significant industrial presence along the banks of the River Suir, while Great Island Power Station, a large-scale industrial development, is visible along the banks of the River Barrow, near the confluence with the River Suir. The study area also comprises some notable heritage assets, most notably Dunbrody Abbey, situated to the east of the River Barrow in County Kilkenny, whilst Waterford City is the oldest city in Ireland and the site of a historic Viking settlement.

Overall, the study area comprises contrasting landscape types, values, and sensitivities. This diversity is reflected in the fact that three counties, Kilkenny, Wexford, and Waterford, are encompassed within the study area, each containing their own localised character and values. According to the Kilkenny County Development Plan, the proposed development is located across both the 'Upland' and 'Lowland' landscape types. An area designated as 'Highly Scenic/Visually Pleasing' is situated to the south and east of Parcel 4 and relates to the Suir and Barrow river corridors. In the eastern extent of the study area, within County Wexford, the relevant landscape units include 'River Valley' and 'Lowlands', which are respectively rated as having moderate–high and low–moderate landscape sensitivity. In County Waterford, in the southern portion of the study area, the relevant landscape units include LCA 2C – East Waterford Lowlands, LCA 4B – Suir Estuary, and LCA 7A – Waterford City and Environs. Within this area, landscape sensitivity ranges from 'Most Sensitive' to 'Least Sensitive'. As is also the case in Counties Wexford and Kilkenny, the most susceptible landscape areas in County Waterford within the study area are those in the immediate vicinity of the river valleys.

On balance, for the reasons outlined above, it is considered that the study area is primarily a rural landscape, characterised by typical rural and productive landscape values. There is a strong sense that the area has been shaped by human activity over time, particularly in its southern and south-western extents, where the influence of Waterford City is notable. Nonetheless, there are some more sensitive parts of the landscape, primarily associated with the River Suir and River Barrow, both of which offer a degree of scenic amenity and a sense of naturalness. However, it is also important to note that even sections of these natural watercourses have been shaped by human activity and are subject to highly anthropogenic developments. Therefore, on balance of these factors and in accordance with the criteria outlined in in Table 1.1, the landscape sensitivity is deemed to be **Medium-low**, with lands in the immediate surrounds of the river valley landscape within the study area deemed of Medium to High sensitivity dependant on their degree of human influence. This sensitivity classification aligns with the classification identified in the submitted solar development LVIA (refer to planning ref 25/60391)

1.6.3 Assessment of Receptor Sensitivity – Visual

The study area generally presents as a typical rural landscape, albeit some receptors within the study area have a slightly heightened sensitivity due to the presence of elevated terrain that affords broader open views across the wider working rural landscape and areas of high amenity that present with some sense of the naturalistic such as the River Suir and River Barrow corridors.

With regard to the substation site, the principal receptors are largely local community receptors influenced by the typical rural landscape surrounding the development. These are classified as having a Medium–Low receptor sensitivity. To the west of the site, there are also several major route receptors influenced by a combination of typical rural landscapes and more highly anthropogenic features, such as industrial land uses and other major route infrastructure. These areas tend to be less susceptible to visual change and are therefore classified as Medium–Low and Low.

In terms of designated scenic amenity, the nearest protected view to the site is located to the west of Parcel 4 and is described as "*Views over the confluence of the Rivers Suir and Barrow at Snow Hill*." This scenic view is relevant in the context of the proposed solar farm and not the proposed substation and grid connection. It should be noted that whilst pleasant views are afforded here, they are primarily directed across a smaller valley that contains a tributary of the River Suir. Indeed, no clear visibility of the confluence of the Rivers Suir and Barrow is available from this local road. Within County Waterford, a scenic route exists in the vicinity of Cheekpoint and is similarly likely designated due to its proximity to the River Suir and River Barrow valleys. Whilst it is acknowledged that these river valley landscapes possess an elevated degree of scenic amenity, it is also important to note that the nearest sections of these watercourses are influenced by a variety of highly anthropogenic development types, including Belview Port and Great Island Power Station, both of which detract from any strong sense of naturalness in these sections. Overall, scenic designations within the study area and in the immediate surroundings of the river valley corridor landscape types are classified with a receptor sensitivity ranging between Medium and High-medium. It is important to note that these scenic designations are more relevant to the solar development aspect of the project as they are contained well away from the proposed substation.

Other sensitive receptors within the study area include amenity and heritage receptors, some of which are also associated with the wider context of the river valley landscape. Both Faithlegg Demesne and Dunbrody Abbey are notable heritage assets within the surrounding landscape and are influenced by the adjacent river valleys. These and similar receptors are classified with a visual receptor sensitivity of High-medium.

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 it 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 contained in the methodology Section 1.2.5, visual receptor sensitivity judgement are provided for each representative viewpoint in the table below in section 1.6.7 below

1.6.4 Magnitude of Landscape Effects – Construction Stage

In terms of physical landscape effects, the proposed substation and grid connection will require some localised excavation works to facilitate the foundations of the proposed IPP control building, GIS building, interface towers and other ancillary electrical infrastructure equipment. Some sections of new internal access/service tracks will be constructed to service the substation and these will be similar in nature to farm tracks that can be found throughout this rural context. The proposed substation will require minor reprofiling of the terrain within the substation compound result in areas of cut and fill as well as removal of the prevailing grassland land cover. The proposed development will be accessed for both the construction and operational phases by means of an entrance from the local road to the west of the substation compound.

In terms of physical construction stage landscape effects for the wider project, the proposed solar farm will not require any significant excavation that would permanently alter the landform of the site. Some sections of new internal access/service tracks will be constructed to service the site and these will be similar in nature to farm tracks that can be found throughout this rural context.

The proposed Drumdowney Solar Farm application includes for the removal of some c. 285.4 linear meters of existing hedgerow will be required to facilitate the construction of access track throughout the site and the proposed site access widening. This figure also includes for some 69.2 linear meters of removal to facilitate the proposed substation compound. In addition to the above, a further 17m of removal will be required to facilitate the proposed substation access tracks. Therefore a combined total of some c. 302.4m m of hedgerow removal will be required to facilitate the proposed substation development and wider solar farm. Notwithstanding the above areas of removal, this will be offset by the planting of c. 2,093 linear meters of new native hedgerow and the bolstering of some c. 22,022 linear meters of existing hedgerow that forms part of the wider solar farm application, whilst the proposed substation will see the bolstering of a further 531 linear meters of existing hedgerow and a further 287 linear meters of new native hedgerow.

All substation and grid connection works will be carried out in accordance with international best practice and full compliance with health and safety requirements. Construction of the proposed substation is estimated to take 24 months to complete. Construction related effects are, therefore, brief in nature and will only result in short-term landscape and visual impacts. Overall, the magnitude of construction stage effects is deemed Medium.

Combined with the Medium-low landscape sensitivity of the study area, the significance of construction stage effect is deemed Moderate-Slight and of a Negative quality.

1.6.5 Magnitude of Visual Effects – Construction Stage

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 some localised stockpiles of stripped topsoil, construction materials awaiting use and a small construction compound located on the site. There is also likely to be tower cranes erected on site to facilitate the construction of the GIS building, which will likely be visible over a wider area than the substation development itself.

However, aside from the site's immediate vicinity, a large part of this short-term activity within the site will remain screened and partially screened from view the surrounding mature layers of intervening vegetation. Furthermore, construction-related activity is short-term in nature and will cease once the development becomes fully operational. Thus, construction stage impacts are likely to result in a visual effect no greater than High-medium in the immediate surroundings of the site.

Coupled with the Medium and Medium-low visual receptor sensitivities in the immediate surrounds of the site, the construction stage visual impacts in the immediate vicinity of the site will be no greater than Moderate, and will reduce considerable beyond 500m-1000m from the site, where the proposed substation development and wider solar farm will be heavily screened. As a result, construction stage visual impacts are not considered to be significant.

1.6.6 Magnitude of Landscape Effects – Operational Stage

There will some very localised physical landscape effects in the immediate context of the proposed substation compound, however, for the most part, the terrain of the site will remain largely unaltered. In fact, the proposed landscape mitigation measures, which comprises the enhancement (bolstered) existing hedgerow, will generate some localised positive landscape effects during the operation phase of the proposed development.

Whilst the wider solar farm will be decommissioned after 40 years, the proposed substation and grid connection will remain as part of the electricity transmission network, and thus, landscape effects generated by the proposed substation development are deemed Permanent in terms of duration. It is important to note that existing electricity cables and pylon structures are characteristic features of this rural landscape, and thus, the introduction of the proposed substation represents the intensification of an established land use as opposed to the introduction of a new and unfamiliar one. Furthermore, due to the relatively contained nature of the study area, there will be limited parts of the study area that will afford visibility of the proposed substation. Thus, the limited visibility of the proposed substation development and wider solar farm will heavily diminish the development's potential to alter the surrounding landscape character.

On the basis of the factors discussed above it is considered that the magnitude of operational stage landscape effect is Medium within the immediate vicinity, being those lands contained within approximately 500m of the proposed development. Thereafter, the magnitude of the operational stage landscape impact is deemed to reduce to Low and Negligible, as the proposed development becomes a progressively smaller component of the overall landscape fabric.

With reference to the significance matrix (Table 1.4) above, the **Medium-low** landscape sensitivity judgement attributed to the study area, coupled with a **Medium** magnitude of landscape impact in the immediate vicinity (<500m) of the proposed development is considered to result in an overall significance of no greater than **Moderate-slight**, with the remainder of the 5km radius study area likely to experience **Slight** or **Imperceptible** landscape impacts.

1.6.7 Magnitude of Visual Effects – Operational Stage

The assessment of visual impacts at each of the selected viewpoints is aided by photomontages of the proposed development. Photomontages are a 'photo-real' depiction of the scheme 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:

1. Existing view;
2. Outline view (yellow outline showing the extent of the proposed solar farm location and the proposed substation including all associated overground works overlaid on the photograph);

3. Montage view (landscaping at Construction Month 12 – Solar Panels and proposed Substation Installed – early stage planning after two growing seasons) – this includes a fully rendered view of the proposed substation, however this will form part of a separate application to An Bord Pleanála as a Strategic Infrastructure Development; and

4. Montage view with mitigation established.

As indicated in the planning application drawings, the solar panels proposed on this site may range from 2.0m – 3.25m in height. The photomontages that provide the basis for this visual impact assessment include panels rising to a height of 3.25m, representing a worst-case scenario in terms of potential panel visibility and wider impact assessment considerations. It is not considered that panels in the lower ranges of this panel design envelope will generate any additional visual impacts other than those stated below. Indeed, the smaller panels have the potential to be furthered screened by surrounding hedgerow vegetation and generate marginally reduced visual impacts. As such, all panel heights within the range specified in the planning application drawings are considered in this assessment in terms of impact assessment.

VP NO.	EXISTING VIEW	VP SENSITIVITY	VISUAL IMPACT MAGNITUDE (PRE & POST MITIGATION)	PRE MITIGATION SIGNIFICANCE / QUALITY / DURATION OF IMPACT	POST MITIGATION SIGNIFICANCE / QUALITY / DURATION OF IMPACT
VP1	**Local road at Rathpatrick east of N29**: This is a view afforded from a local road corridor in the townland of Rathpatrick, east of the busy N29 major route. The depicted view extends south from the local road corridor towards sloping pastoral fields and intervening hedgerow vegetation, which contains the view at a short distance. An existing overhead electricity corridor and its associated pylon structure are visible in the middle ground, traversing the nearby pastoral lands.	Medium-low	The proposed substation and grid connection will be almost fully screened here. Only the proposed lightning mast within the substation development will be visible but is unlikely to go unnoticed here. Thus, the magnitude of visual effect is deemed Negligible.	Imperceptible / Medium-term / Neutral	Imperceptible / Long-term / Neutral
VP2	**L3433 at Rathpatrick (2):** This view is afforded from approximately 350 meters northeast of VP11 from the solar application, located slightly further downslope along the local road. The depicted view is oriented to the west and extends uphill across a patchwork of pastoral farmland and intervening hedgerow vegetation, where several overhead cable corridors traverse the nearby landscape. **Note:** The photomontage utilises Google Street View photography, which is captured at a greater height (c. 2.5m)	Medium-low	The proposed substation development will be visible uphill to the west along the nearby ridge. The proposed substation will appear behind existing pylon structures, while the newly proposed pylons will be visible to the north of the GIS substation building. Although the development will add to the built forms along the skyline in this view, it is thematically linked to the existing overhead cable corridors and, as such, will not appear incongruous. Nevertheless, the proposed development will increase the quantum of built form in this aspect of the view. It should be noted, however, that the scale of the substation and pylon structures does not appear excessive and are visually well assimilated within the receiving landscape context.	Slight / Medium-term / Negative	Slight / Long-term / Negative

VP NO.	EXISTING VIEW	VP SENSITIVITY	VISUAL IMPACT MAGNITUDE (PRE & POST MITIGATION)	PRE MITIGATION SIGNIFICANCE / QUALITY / DURATION OF IMPACT	POST MITIGATION SIGNIFICANCE / QUALITY / DURATION OF IMPACT
	than the typical eye level (c. 1.7m), and therefore exaggerates the actual degree of visibility of the proposed development.		On balance, and for the reasons outlined above, the magnitude of visual effect is deemed to be Low. Once the proposed mitigation screen planting has fully established, views of the locally elevated proposed substation and grid connection will be further screened and softened. Whilst the proposed development will still be visible once the proposed mitigation screen planting is fully established, it will be further softened and anchored to the receiving landscape context. Nevertheless, the residual magnitude of effect remains Low		
VP3	L3414 at Rathpatrick east of Rathpatrick Cross Roads: This is a contained section of a local road located along sloping land to the east of the Rathpatrick crossroads. The view is representative of a cluster of residential dwellings situated on the southern verge of the local road. The depicted view is oriented uphill to the northeast, where visibility is limited by a nearby ridge and layers of intervening vegetation. Several overhead cable corridors and pylon structures are also visible in this aspect of the view.	Medium-low	Filtered views of the proposed substation and grid connection will be afforded from this local road context, where it is situated behind two layers of nearby hedgerow vegetation at the summit of the narrow ridge. The IPP control building will be heavily screened, while the proposed GIS substation building will have a more noticeable visual presence. Nonetheless, the proposed building does not appear over-scaled and will resemble a large agricultural farm shed. Indeed, it is likely only to be perceived as an electrical infrastructure development due to its proximity to the surrounding overhead cable corridor. It should be noted that the GIS building will screen the proposed interface towers from this viewpoint. Overall, the proposed development will increase the intensity of built form in the area but will not appear	Moderate-slight / Medium-term / Negative	Moderate-slight / Long-term / Negative

VP NO.	EXISTING VIEW	VP SENSITIVITY	VISUAL IMPACT MAGNITUDE (PRE & POST MITIGATION)	PRE MITIGATION SIGNIFICANCE / QUALITY / DURATION OF IMPACT	POST MITIGATION SIGNIFICANCE / QUALITY / DURATION OF IMPACT
			incongruous. On balance, and for the reasons outlined above, the residual magnitude of visual effect here is deemed to be Medium. Once the proposed mitigation screen planting has fully established, which comprises the enhancement of surrounding existing hedgerows, it will further aid in softening and screening the proposed development from this local landscape context. Whilst residual visibility of the proposed GIS building will still be afforded from here, the bolstered hedgerow will screen views of the proposed control building and any of the lower built features within the substation compound. Thus, prior to the establishment of the proposed mitigation screen planting, the residual magnitude of effect will reduce to Medium-low		
VP4 (a + b)	L3433 at Rathpatrick: This view is taken from a local road in the townland of Rathpatrick and is representative of surrounding local community receptors. This view is representative of some of the nearest dwelling receptors to the southeast of the proposed substation. The view is truncated at the roadside edge by a banked hedgerow. It should be noted that a slightly more open view is afforded across the landscape to the	Medium	The proposed substation development will be entirely screened from here by the banked hedgerow vegetation to the north of the local road. Nevertheless, the proposed panels within the wider solar farm will be visible along the elevated terrain in the distance to the southeast (refer to submitted VP11 in the solar farm application), contained by dense areas of surrounding vegetation and forestry. The built tone and texture of the panels will contrast with the verdant tones and texture of the surrounding pastoral fields. However, from this	Slight/ Medium-term / Negative	Slight/ Long-term / Negative

VP NO.	EXISTING VIEW	VP SENSITIVITY	VISUAL IMPACT MAGNITUDE (PRE & POST MITIGATION)	PRE MITIGATION SIGNIFICANCE / QUALITY / DURATION OF IMPACT	POST MITIGATION SIGNIFICANCE / QUALITY / DURATION OF IMPACT
	southeast, beyond a nearby residential landholding, with a distant rolling ridge visible over the adjacent hedgerow. The ridge is cloaked in a mix of farmland and forestry, forming the backdrop to this aspect of the view.		distance, the visibility of the panels will have a limited impact on the visual amenity afforded from this location. While the visible panels will marginally increase the intensity of built development in the area, they will not block or obstruct any sensitive viewing aspects. Thus, the magnitude of effect here is deemed low. Once the proposed mitigation screen planting has fully established, the proposed development will be further anchored within the landscape context, and the built edge of the panel arrays will be marginally softened. Nonetheless, due to the elevated nature of the site as seen from this receptor, the screening effect will remain limited. Thus, the residual magnitude of effect remains Low.		

1.6.8 Monitoring

1.6.8.1 Construction Phase

Landscape tender drawings and specifications will be produced to ensure that the landscape work is implemented in accordance with best practice. A landscape management and maintenance schedule also forms part of the solar application, which includes relevant information for the substation aspect of the development. This document will include tree work procedures, soil handling, planting and maintenance. The contract works will be supervised by a suitably qualified landscape architect.

It is also proposed to include early-stage planting within and around the site as part of the landscape mitigation proposals. It is proposed to undertake the early-stage planting during the first month of the proposed construction phase, which lasts a total of 24 months (inclusive of proposed solar farm). As a result, the early stage planting will have up to two growing seasons to establish, prior to the implementation of the proposed solar panels, which will be included during at month 12 of the 24 month construction programme. Thus, once implemented, the proposed planting measures will soften and screen the proposed substation and wider solar farm and some construction-related activities from surrounding receptors. By the time the proposed substation, grid connection and solar farm construction has concluded, the proposed planting will have been in place for more than two growing seasons, allowing the advanced nursery stock and whips to slightly fill out and further screen and soften the proposed development. It is important to note that the montage view in the submitted photomontage set represents the proposed development at construction month 12 when the panels have been implemented and the proposed mitigation planting has up to two growing seasons to fill out.

All tree protection requirements will be installed on commencement of the development and removed on a phased basis as stages of the development are completed.

1.6.8.2 Operational Phase

This will consist of weed control, replacement planting, pruning etc. All landscape works will be in an establishment phase for the initial three years from planting. All works will be monitored on an ongoing basis to ensure the quality of the development is maintained. Details of all monitoring and maintenance are outlined in the Landscape Management and Maintenance Schedule for the proposed development.

1.7 CUMULATIVE EFFECTS

The principal potential cumulative effects relate to the wider solar farm application, which is directly linked to the proposed SID project. Although the combined developments will increase the intensity and scale of electrical infrastructure and solar development within the surrounding landscape, the substation element of the proposed project is likely to be perceived as a distinctly separate development, as it is isolated from the main solar arrays. The combined effect of both aspects of the overall project has been accounted for within this assessment and within the landscape and visual effects assessment for the proposed solar element of the development. Overall, the combined effect of the two developments will be of a moderate to lower order of residual effects in terms of both landscape and visual effects. Consequently, it is not considered that the combined substation and solar development will result in significant cumulative effects.

1.8 CONCLUSIONS

In terms of landscape impacts, the proposed substation development is considered to have only a modest physical impact as it is consolidated within the existing hedgerow network and will not require significant excavation works. Furthermore, construction of the wider solar farm will require more limited construction stage work, with excavations and soil stripping localised to modest scale ancillary built features including access and maintenance tracks, underground cable connections and transformers/inverter stations.

In terms of impacts on landscape character, the proposed substation development, whilst part of the wider solar farm development, will likely be perceived as a separate electrical infrastructure development as it is isolated from any of the proposed solar arrays. Nonetheless, the substation development is contained within a part of the surrounding landscape that has a strong influenced from utilitarian land uses and built features such as major route corridors and existing overhead cable corridors. Indeed, the proposed substation development is contained along the alignment of an existing overhead cable corridor, which it will connect to, and thus, will not appear as a highly incongruous form of built development in this context. Furthermore, despite its locally elevated location, the proposed substation is relatively discreetly located along a plateau ridge and will not be prominently visible beyond its immediate landscape context as it avails a notable degree of screening in the form of existing established hedgerow vegetation. Indeed, where visible, it will likely be perceived as a large agricultural farm shed and will be finished in a similar muted green tone to other surrounding farm buildings.

Much of the site, wider solar farm and its immediate surroundings constitute a productive, modified rural landscape with associated landscape values. Whilst the proposed development may slightly alter the local 'landscape fabric', it does not markedly affect the prevailing landscape pattern or the overriding rural landscape character of the area. Whilst there is a heightened degree of landscape sensitivity in the vicinity of Parcel 4 to the south of the proposed substation, due to the presence of two prominent watercourses, this part of the surrounding landscape is well offset from the landscape context of the substation and grid connection.

Therefore, combined with the 'Medium-low' magnitude of operational stage landscape impact, the overall significance of operational stage landscape effect was deemed no greater than 'Moderate-slight' and of a Negative quality.

Visual impacts for the proposed substation were assessed at 4 representative viewpoints throughout the immediate landscape context, representing various viewing distances, angles, and receptor types. The typical and modified nature of its immediate surrounding context is reflected in the Medium-low receptor sensitivity attributed to all four representative viewpoints.

The overall significance of visual effect ranged between Moderate–Slight and Imperceptible. Indeed, the clearest view of the proposed substation development will be from the L3414 at Rathpatrick to the southwest of the proposed substation. Nonetheless, even from this local context, the substation development is well set back from the local road and benefits from a degree of screening provided by surrounding layers of existing hedgerow vegetation. This vegetation will also be supplemented with additional native stock and will be allowed to grow out to a maximum height of approximately 4 m, which will further screen and soften the development within its immediate surroundings. All other residual visual effects were classified as Slight or Imperceptible, as the proposed substation is viewed well set back from all other surrounding receptors and does not present as an incongruous form of built development, either in terms of its scale or its function.

Overall, it is considered that the proposed substation and wider solar development is a suitably sited and scaled development that is well-screened by the surrounding layers of dense vegetation. Furthermore, in terms of the surrounding landscape and visual policy, it is considered that the proposed development is contained in a robust part of County Kilkenny that can well accommodate a development of this scale and nature.

1.8.1 Overall Significance of Effect

Based on the landscape and visual impact judgements provided throughout this LVIA, the proposed Drumdowney SID substation and grid connection is not considered to give rise to any significant residual effects.

1.9 REFERENCES

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