12 LANDSCAPE AND VISUAL AMENITY

12.1 INTRODUCTION

12.1.1 Background and Objectives

This chapter of the EIAR assesses the impacts of the Project on the landscape and visual amenity of the receiving environment. Although closely linked, landscape and visual impacts are assessed separately. Where negative effects are predicted, the chapter identifies appropriate mitigation strategies therein. The assessment will consider the potential effects during the following phases of the Project:

- Construction
- Operation
- Decommissioning (final phase)

The Proposed Development refers to all elements of the application for the construction and operation of the Firlough Wind Farm and Hydrogen Plant (**Chapter 2: Project Description**).

Common acronyms used throughout this EIAR can be found in **Appendix 1.4**.

This chapter of the EIAR is supported a portfolio of photomontages provided as a separate booklet and the following Appendix document provided in **Volume IV** of this EIAR:

- **Appendix 12.1**: Visual Impact Assessments at VPs
- **Appendix 12.2**: Landscape Mitigation Plan

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

Visual Impact Assessment (VIA) relates to assessing effects on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape

and/or introduction of new elements. Visual impacts may occur from: visual obstruction (blocking of a view, be it full, partial or intermittent) or Visual Intrusion (interruption of a view without blocking).

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

12.1.2 Assessment Structure

In line with the Guidelines for Landscape and Visual Impact assessment (2013), the structure of this chapter will consist of separate considerations of landscape effects and visual effects in the following order:

- Assessment of landscape value and sensitivity
- Assessment of the magnitude of landscape effects within the Study Area; (comprised of the 'Central Study Area' (in the case of Firlough Wind Farm, within c. 5 km of the proposed Wind Farm Site) and 'Wider Study Area' (5-20 km from the Wind Farm Site)). The focussed study area for the proposed Hydrogen Plant is 2 km radius and is nested inside the wider study area of the Wind Farm.
- Assessment of the significance of landscape impacts
- Assessment of visual receptor sensitivity
- Assessment of visual impact magnitude at representative viewpoint locations (using photomontages)
- Assessment of visual impact significance
- Assessment of cumulative landscape and visual impacts

12.1.3 Statement of Authority

This Landscape and Visual Impact Assessment was prepared Richard Barker, Principal Landscape Architect at Macro Works Ltd, a specialist LVIA company with over 20 years of experience in the appraisal of effects from a variety of energy, infrastructure and commercial developments. Relevant experience includes LVIA work on over 140 on-shore wind farm proposals throughout Ireland, including six Strategic Infrastructure Development (SID) wind farms. Macro Works and its senior staff members are affiliated with the Irish Landscape Institute.

12.1.4 Description of the Project

A description of the Project has been included in **Chapter 2: Project Description**.

12.2 Assessment Methodology and Significance Criteria

12.2.1 Assessment Methodology

Production of this Landscape and Visual Impact Assessment (LVIA) involved baseline work in the form of desktop studies and fieldwork comprising professional evaluation by qualified and experienced Landscape Architects. This entailed the following:

12.2.1.1 Desktop Study

- Establishing an appropriate Study Area from which to study the landscape and visual impacts of the Proposed Development.
- Review of a Zone of Theoretical Visibility (ZTV) map, which indicates areas from which the Proposed Development is potentially visible in relation to terrain within the Study Area.
- Review of relevant County Development Plans, particularly with regard to sensitive landscape and scenic view/route designations.
- Selection of potential Viewshed Reference Points (VRPs) from key visual receptors to be investigated during fieldwork for actual visibility and sensitivity.

12.2.1.2 Fieldwork

- Recording of a description of the landscape elements and characteristics within the Study Area.
- Selection of a refined set of VRP's for assessment. This includes the capture of reference images and grid reference coordinates for each VRP location for the visualisation specialist to prepare photomontages.

12.2.1.3 Appraisal

- Consideration of the receiving landscape with regard to overall landscape character as well as the salient features of the Study Area including landform, drainage, vegetation, land use and landscape designations.
- Consideration of the visual environment including receptor locations such as centres of population and houses, transport routes, public amenities and facilities and designated and recognised views of scenic value.
- Consideration of design guidance and planning policies.
- Consideration of potentially significant construction stage and operational stage effects and the mitigation measures that could be employed to reduce such effects.
- Estimation of the significance of residual landscape impacts.
- Estimation of the significance of residual visual impacts aided by photomontages prepared at all of the selected VRP locations.

- Estimation of cumulative landscape and visual effects in combination with other surrounding developments that are either existing or permitted.

12.2.2 Relevant Legislation and Guidance

This LVIA uses methodology as prescribed in the following guidance documents:

- Environmental Protection Agency (EPA) publication 'Guidelines on the Information to be contained in Environmental Impact Statements (2022) and the accompanying Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (Draft 2015).
- Landscape Institute and the Institute of Environmental Management and Assessment publication entitled Guidelines for Landscape and Visual Impact Assessment – Third Addition (GLVIA-2013).
- NatureScot Guidance Note: Assessing the Cumulative Landscape and Visual Impacts of Onshore Wind Energy Developments (2021).
- Department of the Environment, Heritage and Local Government Wind Energy Development Guidelines (2006). The provisions of the Draft Revised Guidelines (2019) will also be considered.
- Scottish Natural Heritage (SNH) Visual representation of wind farms: Best Practice Guidelines (version 2.2 - 2017).

12.2.3 Definition of Study Area

The Wind Energy Development Guidelines published by the Department of the Environment, Heritage and Local Government (2006) specify different radii for examining the zone of theoretical visibility of proposed wind farm projects (ZTV) and these remain the same in the Draft Revised Guidelines (2019). The extent of this study area is influenced by turbine height, as follows:

- 15 km radius for blade tips up to 100 m
- 20 km radius for blade tips greater than 100 m
- 25 km radius where landscapes of national and international importance exist.

In the case of this Project, the blade tips are up to 185 m high and, thus, the minimum ZTV radius recommended is 20 km from the outermost turbines of the scheme. There are not considered to be any sites of national or international importance between 20 – 25 km and thus, the radius of the Study Area will remain at 20 km. Notwithstanding the full 20 km extent of the LVIA Study Area, there will be a particular focus on receptors and effects within the Central Study Area where there is higher potential for significant impacts to occur. When referenced within this assessment, the 'Central Study Area' is the landscape within c. 5 km of the Wind Farm Site.

There are no specific guidelines to determine the extent of the Hydrogen Plant study area. However, the GLVIA-2013 allow for landscape and visual specialists to determine the appropriate study area ion the basis of professional experience and the likelihood of significant effects to occur. In this case a 2 km radius focussed study area has been applied to the Hydrogen Plant element of the Project on this basis. Furthermore, the proposed Hydrogen Plant study area is nested inside the proposed Wind Farm study area allowing a broader consideration of sensitive receptors for the Hydrogen Plant than would otherwise be the case.

12.2.4 Computer Generated Images, Photomontages and Wireframes

This LVIA is supported by a variety of computer-generated maps and graphics as well as verifiable photomontages that depict the Proposed Development within the views from a range of represented visual receptor locations. These maps, graphics and visualisations consist of the following:

- Zone of Theoretical Visibility (ZTV) maps.
- Photomontages consisting of existing views, wireframe views and proposed views.

12.2.5 Assessment Criteria for Landscape Effect

The classification system used by Macro Works to determine the significance of landscape and visual impacts is based on the IEMA Guidelines for Landscape and Visual Impact Assessment (2013). When assessing the potential impacts on the landscape resulting from a Proposed Development, the following criteria are considered:

- Landscape character, value and sensitivity
- Magnitude of likely impacts
- Significance of landscape effects

The sensitivity of the landscape to change is the degree to which a particular landscape receptor (Landscape Character Area (LCA) or feature) can accommodate changes or new features without unacceptable detrimental effects to its essential characteristics. Landscape Value and Sensitivity is classified using the following criteria:

Table 12.1: 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.

Sensitivity	Description
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.

The magnitude of a predicted landscape impact is a product of the scale, extent or degree of change that is likely to be experienced as a result of the Proposed Development. 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 Redline Boundary that may have an effect on the landscape character of the area.

Table 12.2: Magnitude of Landscape Impacts

Sensitivity	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 overall 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 an overall 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 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.

Sensitivity	Description
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.

The significance of a landscape impact is based on a balance between the sensitivity of the landscape receptor and the magnitude of the impact. The significance of landscape impacts is arrived at using the following matrix:

Table 12.3: Landscape Impact Significance Matrix

	Sensitivity of Receptor				
Scale/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

Note: Judgements deemed 'substantial' and above are considered to be 'significant impacts' in EIA terms.

12.2.6 Assessment Criteria for Visual Effect

As with the landscape impact, the visual impact of the Proposed Development will be assessed as a function of receptor sensitivity versus magnitude. In this instance, the sensitivity of visual receptors, weighed against the magnitude of visual effects.

12.2.6.1 Visual Sensitivity

Unlike landscape sensitivity, visual sensitivity has an anthropocentric basis. Visual sensitivity is a two-sided analysis of receptor susceptibility (people or groups of people) versus the value of the view on offer at a particular location.

To assess the susceptibility of viewers and the amenity value of views, the assessors use a range of criteria and provide a four-point weighting scale to indicate how strongly the viewer/view is associated with each of the criterion. Susceptibility criteria is extracted directly

from the IEMA Guidelines for Landscape and Visual Assessment (2013), whilst the value criteria relate to various aspects of a view that might typically be related to high amenity including, but not limited to, scenic designations. These are set out below:

- **Susceptibility of receptor group to changes in view.** This is one of the most important criteria to consider in determining overall visual sensitivity because it is the single category dealing with viewer susceptibility. In accordance with the IEMA Guidelines for Landscape and Visual Assessment (3rd edition 2013) 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".*

12.2.6.2 Value of Views

To assess the amenity value of views, Macro Works use a range of criteria that might typically be related to high amenity value including but not limited to, scenic designations. These are set out below:

- **Recognised scenic value of the view** (County 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 Development Plans, at least, a public consultation process is required.

- **Views from within highly sensitive landscape areas**. Again, highly sensitive landscape designations are usually part of a county's Landscape Character Assessment, which is then incorporated with the County Development Plan and is therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the landscape around them.
- **Intensity of use, popularity**. Whilst not reflective of the amenity value of a view, this criterion relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at county or regional scale.
- **Connection with the landscape**. This considers whether or not receptors are likely to be highly attuned to views of the landscape i.e., commuters hurriedly driving on busy national route versus hill walkers directly engaged with the landscape enjoying changing sequential views over it.
- **Provision of 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**. Remote and tranquil viewing locations are more likely to heighten the amenity value of a view and have a lower intensity of development in comparison to dynamic viewing locations such as 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 obvious human interventions.
- **Presence of striking or noteworthy features**. A view might be strongly valued because it contains a distinctive and memorable landscape feature such as a promontory headland, lough or castle.
- **Historical, cultural or spiritual value**. Such attributes may be evident or sensed at certain viewing locations that 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 other similar views might be afforded in the local or the national context.
- **Integrity of the landscape character in view**. This criterion considers 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 criterion considers whether there is special sense of wholeness and harmony at the viewing location.

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

Those locations where highly susceptible receptors or receptor groups are present and which are deemed to satisfy many of the view value criteria above are likely to be judged to have a high visual sensitivity and vice versa.

12.2.6.3 Visual Impact Magnitude

The magnitude of visual effects is determined on the basis of two factors; the visual presence of the proposal and its effect on visual amenity.

Visual presence is a somewhat quantitative measure relating to how noticeable or visually dominant the proposal is within a particular view. This is based on a number of aspects beyond simply scale in relation to distance. Some of these include the extent of the view as well as its complexity and the degree of existing contextual movement experienced such as might occur where turbines are viewed as part of / beyond a busy street scene. The backdrop against which the Proposed Development is presented and its relationship with other focal points or prominent features within the view is also considered. Visual presence is essentially a measure of the relative visual dominance of the proposal within the available vista and is expressed as such i.e., minimal, sub-dominant, co-dominant, dominant, highly dominant.

For wind energy developments, a strong visual presence is not necessarily synonymous with adverse impact. Instead, the 2012 Fáilte Ireland survey entitled 'Visitor Attitudes On The Environment – Wind farms' found that:
"Compared with other types of development in the Irish landscape, wind farms elicited a positive response when compared to telecommunication masts and steel electricity pylons"
…. And that:
"most (tourists) *felt that their presence did not detract from the quality of their sightseeing, with the largest proportion (45%) saying that the presence of the wind farm had a positive impact on their enjoyment of sightseeing…*".

The purpose here is not to suggest that turbines are either inherently liked or disliked, but rather to highlight that the assessment of visual impact magnitude for wind turbines is more complex than just the degree to which turbines occupy a view. Furthermore, a clear and comprehensive view of a wind farm might be preferable in many instances to a partial, cluttered view of turbine components that are not so noticeable within a view. On the basis of these reasons, the visual amenity aspect of assessing impact magnitude is qualitative and

considers such factors as the spatial arrangement of turbines both within the scheme and in relation to surrounding terrain and land cover. It also examines whether the Proposed Development contributes positively to the existing qualities of the vista or results in distracting visual effects and disharmony.

It should be noted that as a result of this two-sided analysis, a high order visual presence can be moderated by a low level of effect on visual amenity and vice versa. Given that wind turbines do not represent significant bulk; visual impacts result almost entirely from visual 'intrusion' rather than visual 'obstruction' (the blocking of a view).

In the case of the proposed Hydrogen Plant, which will read as an industrial complex, it is reasonable to consider that wherever it is visible within its rural context, it will contribute negatively to the amenity of the scene. Unlike the proposed Wind Farm, the degree of visual presence of the proposed Hydrogen Plant is likely to relate closely to its overall significance of impact.

The magnitude of visual impacts is classified in the following table derived from the Guidelines for Landscape and Visual Impact Assessment:

Table 12.4: Magnitude of Visual Impacts

Sensitivity	Description
Very High	The proposal obstructs or intrudes into a large proportion or critical part of the available vista and is without question the most noticeable element. An extensive degree of visual change will occur within the scene completely altering its character, composition and associated visual amenity
High	The proposal obstructs or intrudes into a significant proportion or important part of the available vista and is one of the most noticeable elements. A considerable degree of visual change will occur within the scene substantially altering its character, composition and associated visual amenity
Medium	The proposal represents a moderate intrusion into the available vista and is a readily noticeable element. A noticeable degree of visual change will occur within the scene perceptibly altering its character, composition and associated visual amenity
Low	The proposal intrudes to a minor extent into the available vista and may not be noticed by a casual observer and/or the proposal would not have a marked effect on the visual amenity of the scene
Negligible	The proposal would be barely discernible within the available vista and/or it would not influence the visual amenity of the scene

12.2.6.4 Visual Impact Significance

As stated above, the significance of visual impacts is a function of visual receptor sensitivity and visual impact magnitude. This relationship is expressed in the significance matrix in **Table 12.3** above.

12.2.6.5 Quality of Effects

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

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

In the case of commercial wind energy developments and the associated introduction of new moving structures within rural and upland areas, the quality of landscape and visual effects will almost always be negative, rather than positive or even neutral. Unless otherwise stated, the quality of landscape and visual effect judgements herein can be taken as negative.

12.2.6.6 Assessment Criteria for Cumulative Effects

The cumulative effects of the Hydrogen Plant will be considered in accordance with the Guidelines for Landscape and Visual Impact Assessment (2013) and relevant EPA guidance. However, there is specific NatureScot guidance for 'Assessing the Cumulative Landscape and Visual Impacts of Onshore Wind Energy Developments (2021)'. This will be applied to the assessment of the wind energy component of the Proposed Development.

The NatureScot guidance identifies that cumulative impacts on visual amenity consist of combined visibility and sequential effects. The same categories have also been subsequently adopted in the Landscape Institute's 2013 revision of the Landscape and Visual Impact Assessment Guidelines, which also cover cumulative impact assessment for other forms of development i.e., the Hydrogen Plant. The principal focus of wind energy cumulative impact assessment guidance relates to other wind farms - as opposed to other forms of development. This will also be the main focus herein, albeit with a subsequent consideration of cumulative impacts with other forms of notable development (existing, permitted or proposed), particularly within the central Study Area of the Wind Farm and the specific study area for the Hydrogen Plant.

'Combined visibility occurs where the observer is able to see two or more developments from one viewpoint. Combined visibility may either be in combination (where several wind farms are within the observer's arc of vision at the same time) or in succession (where the observer has to turn to see the various wind farms).

Sequential effects occur when the observer has to move to another viewpoint to see different developments. The occurrence of sequential effects may range from frequently sequential (the features appear regularly and with short time lapses between, depending on speed of travel and distance between the viewpoints) to occasionally sequential (long time lapses between appearances, because the observer is moving very slowly and / or there are large distances between the viewpoints.)'

Cumulative impacts of wind farms tend to be adverse rather than positive as they relate to the addition of moving manmade structures into a landscape and viewing context that already contains such development. Based on guidance contained within the SNH Guidelines relating to the Cumulative Effects of Wind Farms (2012) and the DoEHLG Wind Energy Guidelines (2006), cumulative impacts can be experienced in a variety of ways.

Table 12.5 below provides Macro Works' criteria for assessing the magnitude of cumulative impacts, which are based on the SNH Guidelines (2012).

Table 12.5: Magnitude of Cumulative Impacts (Wind Farm)

Magnitude of Impact	Description
Very High	• The Wind Farm will strongly contribute to wind energy development being the defining element of the surrounding landscape. • It will strongly contribute to a sense of wind farm proliferation and a sense of being surrounded by wind energy development. • Strongly adverse visual effects will be generated by the proposed turbines in relation to other turbines.
High	• The proposed Wind Farm will contribute significantly to wind energy development being a defining element of the surrounding landscape. • It will significantly contribute to a sense of wind farm proliferation and being surrounded by wind energy development. • Significant adverse visual effects will be generated by the proposed turbines in relation to other turbines.
Medium	• The proposed Wind Farm will contribute to wind energy development being a characteristic element of the surrounding landscape.

Magnitude of Impact	Description
	• It will contribute to a sense of Wind Farm accumulation and dissemination within the surrounding landscape. • Adverse visual effects might be generated by the proposed turbines in relation to other turbines.
Low	• The proposed Wind Farm will be one of only a few wind farms in the surrounding area and will be viewed in isolation from most receptors. • It might contribute to wind farm development becoming a familiar feature within the surrounding landscape. • The design characteristics of the proposed Wind Farm accord with other schemes within the surrounding landscape and adverse visual effects are not likely to occur in relation to these.
Negligible	• The proposed Wind Farm will most often be viewed in isolation or occasionally in conjunction with other distant wind energy developments. • Wind energy development will remain an uncommon landscape feature in the surrounding landscape. • No adverse visual effects will be generated by the proposed turbines in relation to other turbines.

12.3 BASELINE DESCRIPTION

12.3.1 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 proposal will be assessed. This also includes reference to any relevant landscape character appraisals and the current landscape policy context (both are generally contained within County Development Plans).

A description of the landscape context of the proposed Wind Farm Site, Hydrogen Plant Site and wider Study Area is provided below under the headings of landform and drainage, vegetation and land use, centres of population, transport routes and public amenities and facilities as well as the immediate site context. Additional descriptions of the landscape, as viewed from each of the selected viewpoints, are provided under the detailed assessments later using a similar structure. 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 below. These will be formatted as first an overall Study Area description, followed by the immediate context of the Wind Farm and the Hydrogen Plant.

12.3.2 Landform and Drainage

The Proposed Development is located within the transitional landscape between the upland area the Ox Mountains, and the rolling coastal farmland around Killala Bay, with the Firlough Wind Farm located closer to the Ox Mountains, and the Hydrogen Plant within the aforementioned rolling farmland. The Ox Mountains form a dramatic backdrop to the southeast, effectively dividing the Study Area, with more gradual slopes to the northwest than the southeast. To the northwest of the mountains, where the site is located, the landscape is oriented around the River Moy and Killala Bay, with all waterways and rolling landform oriented towards the coast.

At the southwestern border of the Study Area, the landscape has some influence by Lough Conn, the largest freshwater feature within the Study Area. On the far side of the Ox Mountains from the Wind Farm Site, the southeast and eastern sections of the Study Area are defined by landform and waterways flowing away from the main upland areas, before splitting to either flow north/north-east into the Owenboy/Owenmore River and Ballysadare Bay, or south into the River Moy, which meanders around the southern extent of the Ox Mountains. The Ox Mountains contain a number of varying sized Loughs, with the largest being Easky Lough some 6.4 km north-east, and Lough Talt 5.2 km southeast of the site.

As mentioned previously, the River Moy and Lough Conn are the largest drainage features within the Study Area and form an integral part of the landscape character in its western portions, with rolling drumlins surrounding them. To the north, the River Moy forms extensive sand bars and islands in a complex estuarine environment as it drains into Killala Bay. The coastline of Killala Bay is greatly varied to the west, with sandy beaches and river inlets, as well as the steeper, rockier coastline of Benwee Head (outside of the Study Area). In contrast, the eastern coast of Killala Bay is (aside from Enniscrone Beach) a rougher, rock-strewn coastline defined by stepped cliffs dropping sharply from rolling farmland, contrasting with low sloping rock shelves and gravel beaches further north. To the north/northeast periphery of the Study Area, further along the coastline, there are more gradual transitions with a number of beaches, such as Dunmoran Strand, and Aughris Head.

12.3.2.1 Wind Farm Site and immediate surrounds

The immediate surrounds of the Wind Farm Site are a consistent slope from the base of the steeper upland areas at the foot of the Ox Mountains at approximately 180 amsl at the eastern periphery of the Wind Farm Site, down to 110 amsl at the west, where the landscape in generally level bog. The drainage patterns across the immediate surrounds of the Wind Farm Site are a mix of natural features (small loughs and streams) and man-made features (cutaway bog and farm drains).

12.3.2.2 Hydrogen Plant Site and immediate surrounds

The immediate surrounds of the Hydrogen Plant Site are gently rolling topography, no notable waterways present. The Hydrogen Plant Site is located within a dip in the rolling landscape, at approximately 45 – 50 amsl. There is a small section of peatland / wetland just to the south of the Hydrogen Plant Site.

12.3.3 Vegetation and Land use

The vegetation and land use follows the varied topography of the Wind Farm Study Area and can be generally divided into thirds over a cross-section between the peaks of the Ox Mountains and the shore of Killala Bay. The Ox Mountains are defined by rolling peaks covered by moorland vegetation, intact (generally) banket bog, with occasional patches of conifer forestry or scrub in valleys/gentle sloped areas. This transitions to the west into the gentle sloping foothills and plateaux at the base of the Ox Mountains. This is where the Wind Farm Site is located and in defined by broad scale land uses and vegetation types. While dominated by bog, there is a high proportion of conifer forestry, both overlayed by a distributed collection of existing wind turbines. Further west, this plateau develops into rolling agricultural farmland dotted with a higher proportion of rural residences and farmyard buildings, surrounded by pasture and scattered low vegetation, overlaid with walled and hedgerow field boundaries. This is the area within which the Hydrogen Plant is located. The south-eastern side of the Ox Mountains follows a similar Upland – Bog/Forestry – Farmed pasture pattern down the slopes of the mountains, however across shorter succession/ transition. There is a small collection of built up, residential and commercial land use areas across the wider Study Area, associated with population centres which will be discussed later in this chapter.

12.3.3.1 Wind Farm Site and Immediate surrounds

The Wind Farm Site itself is entirely contained within and surrounded by cutaway bog, with a long heritage (which continues) of domestic use and stewardship by the local community. The landform appears as a level to gently sloping area, covered by exposed and vegetated bog, the expanse of which is halted only by conifer plantations. Overlaid across these, where visible, are the existing wind farm developments of Carrowleagh, Black Lough and further upslope, Bunnyconnellan Wind Farms. The eastern and northern (upland) borders of the Wind Farm Site continue as large areas of domestic cut bog. To the west and south, there is a relatively constant patched border of taller (conifers and woodland) vegetation and mixed-condition bog giving way to rolling farmland further west.

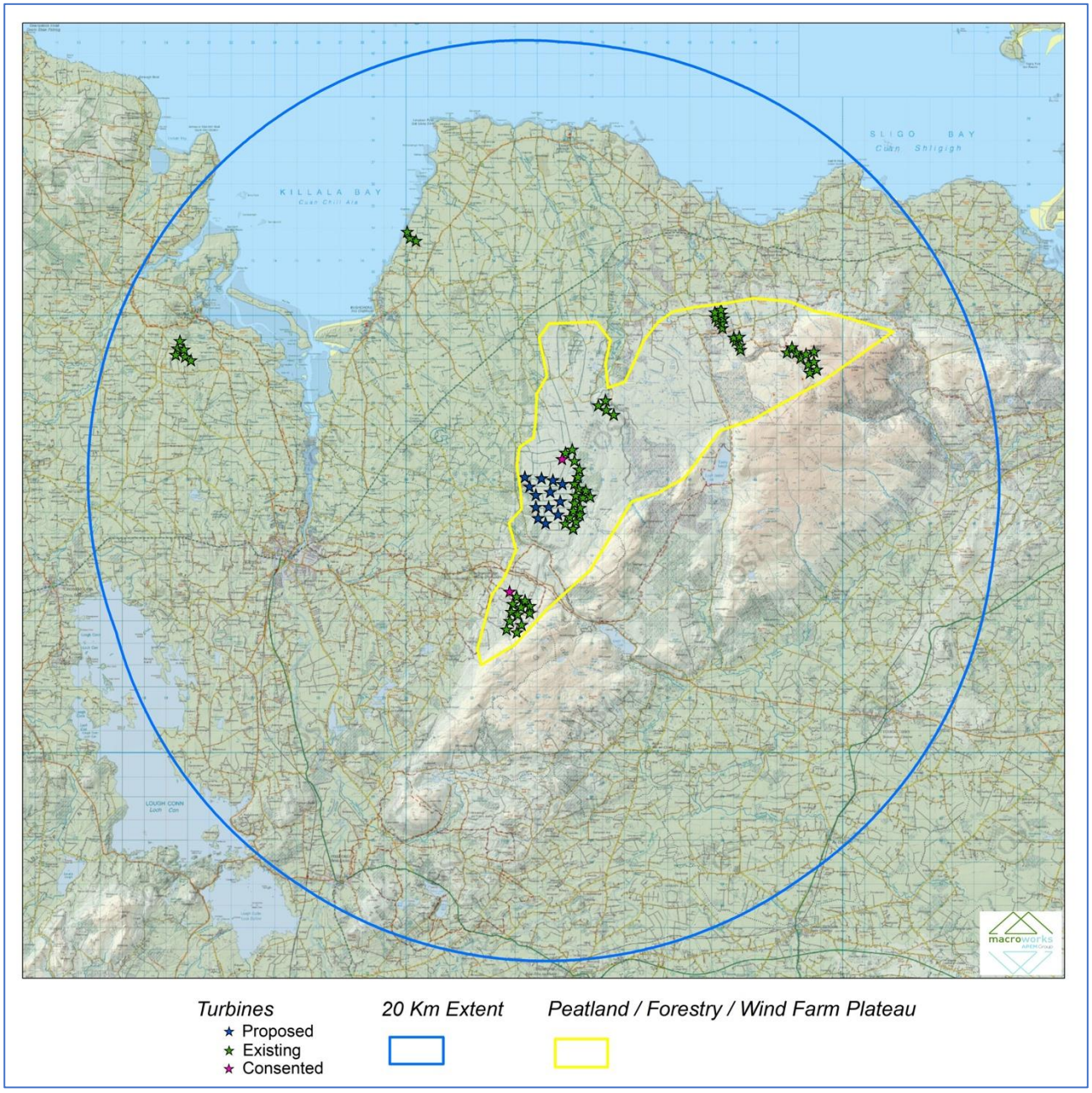

Figure 12.1: Topographical context of the Proposed Development with other wind energy development along the peatland plateau

Figure 12.2: Aerial photograph showing the landscape context of the Wind Farm Site and its immediate surrounds.

Figure 12.3: Topography character of central Study Area (looking southwest from north of Lough Easky)

Figure 12.4: Topography of wider Study Area (looking east towards Wind Farm Site from Corballa)

Figure 12.5: Landcover of the immediate Wind Farm Site and surrounds, showing the interplay of bog, forestry and wind farms

12.3.3.2 Hydrogen Plant Site and Immediate surrounds

The immediate surrounds of the Hydrogen Plant Site are gently rolling topography, with a mix of modified bog (from cutting or planting of conifers) and pasture. To the north, the pasture is interrupted by conifers and residences, while to the south there is a network of small sections of woodland and modified bog. The landcover eastwards (towards the Wind Farm Site and upland areas) is more varied, with smaller, irregular sized fields, while to the south the fields are larger and regular geometric forms, split by the N59 road corridor.

Figure 12.6: View from the N59 towards the proposed Hydrogen Plant site (just beyond vegetated ridge)

12.3.4 Landscape Policy Context and Designations

12.3.4.1 The Department of Environment, Heritage and Local Government Wind Energy Development Guidelines (2006)

The Wind Energy Development Guidelines (2006/2019 revision) provide guidance on wind farm siting and design criteria for a number of different landscape types. This will specifically focus on the location and immediate context of the proposed Wind Farm Site, not the Hydrogen Plant Site. As described in the landform/drainage and landcover/land use section, the site of the Proposed Development is located within the transitional landscape between the Ox Mountains and the rolling coastal farmland. The immediate surrounds of the Wind Farm Site are most consistent with the 'Flat Peatland type from the Wind Energy Development Guidelines. However, the wider context does encompass characteristics from a mix of the landscape types including, 'Mountain Moorland' to the north and east (over the Ox Mountains), while in closer proximity to the Wind Farm Site, 'Transitional Marginal' to the west and south, where the plateaux landscape transitions into smaller scale rolling landform with a mix of land cover.

The most relevant recommendations for the 'Flat Peatland' Landscape type are set out below, but with consideration of the guidance relating to other relevant landscape types considered thereafter.

Flat Peatland Landscapes:

Location – *"Wind energy developments can be placed almost anywhere in these landscapes from an aesthetic point of view. They are probably best located*

away from roadsides allowing a reasonable sense of separation. However, the possibility of driving through a wind energy development closely straddling a road could prove an exciting experience."

Spatial extent *– "The vast scale of this landscape type allows for a correspondingly large spatial extent for wind energy developments."*

Spacing *- "Regular spacing is generally preferred, especially in areas of mechanically harvested peat ridges."*

Layout - *"In open expanses, a wind energy development layout with depth, preferably comprising a grid, is more appropriate than a simple linear layout. However, where a wind energy development is located close to feature such as a river, road or escarpment, a linear or staggered linear layout would also be appropriate."*

Height *- "Aesthetically, tall turbines would be most appropriate. In any case, in terms of viability they are likely to be necessary given the relatively low wind speeds available. An even profile would be preferred."*

Cumulative *- "The openness of vista across these landscapes will result in a clear visibility of other wind energy developments in the area. Given that the wind energy developments are likely to be extensive and high, it is important that they are not perceived to crowd and dominate the flat landscape. More than one wind energy development might be acceptable in the distant background provided it was only faintly visible under normal atmospheric conditions."*

Transitional Marginal Landscapes:

The key points which locate a site within transitional marginal landscapes are:

- *Comprises something of both mountain moorland and farmland, thus involving a mix of small fields, tight hedgerows and shelterbelts;*
- *This landscape type bridges the organised and intensively managed farmland and the more naturalistic moorland;*

Location *– "Wind energy developments might also be located at lower levels in extensive areas of this landscape type, where they will be perceived against a relatively complex backdrop. In these situations it is important to minimise visual confusion such as the crossing by blade sets of skylines, buildings, utility lines and varied landcover."*

Spatial extent *- "Wind energy developments in these landscapes should be relatively small in terms of spatial extent. It is important that they do not dominate but achieve a balance with their surrounds, especially considering that small fields and houses are prevalent."*

"4(a)Wind energy development with regular spacing and linear layout – may not be appropriate due to the undulation of the land from as well as limited field pattern."

"4(b)Wind energy development with irregular spacing and random layout - is more appropriate given the relative undulation of the setting."

"4(c)Large wind energy development straddling two landscape character types within the same visual unit can create visual ambivalence and, thus, negative tension between the two character types involved."

Spacing - *"All options are possible, depending on the actual landscape characteristics. However, irregular spacing is likely to be most appropriate."*

Layout - *"The likely location of wind energy developments on ridges suggests a linear or staggered linear layout whereas on broader hilltops they could be linear or clustered."*

Height - *"…where the upper ground is relatively open and visually extensive, taller turbines may be more appropriate."*

"…the profile can be even or uneven, depending on the profile and visual complexity of the terrain involved. The more rugged and undulating, the greater the acceptability of an uneven profile provided it does not result in significant visual confusion and conflict."

Cumulative - *"This would have to be evaluated on a case-by-case basis, but great caution should be exercised. The spatial enclosure often found in transitional marginal landscapes is likely to preclude the possibility of seeing another wind energy development. However, should two or more wind energy developments be visible within a confined setting a critically adverse effect might result, depending on turbine height and wind energy development extent and proximity."*

Most design options appear to be appropriate for 'Flat Peatland', with the exception of the adjacent existing wind farms and associated cumulative impacts. However, given the transitional nature of the context, the recommendations from the adjacent landscape types will be considered also. In respect of the above guidance, the moderate spatial extent of the proposed Wind Farm Site is in keeping with that recommended for Flat Peatland (contained), as well as the recommendation for mountain moorland that 'Given the typical extensive areas of continuous unenclosed ground, larger wind energy developments can generally be accommodated because they correspond in terms of scale" as there is some limited enclosure provided by land form and vegetation in the immediate surrounds of the site.

The layouts recommended for these landscape types are "a wind energy development layout with depth, preferably comprising a grid, is more appropriate than a simple linear layout" for Flat Peatland, random for mountain moorland, where there are no linear features to relate to, for transitional landscapes, the assumption is that they will be located on ridges, which is not the case for this proposal.

12.3.5 Mayo County Development Plan 2022 – 2028

The Mayo County Development Plan features a Landscape Appraisal rather than a Landscape Assessment, however with regard to identifying the different landscape character areas of the county the two are functionally similar.

The landscape appraisal identifies "*Mayo has many landscapes. One of the first tasks of any analysis is to subdivide the County into its constituent parts. These are called 'Character Units'. Each of them contains an area of land, which has similar character-giving elements such as slope, vegetation and landuse. The appearance of the landscape is relatively uniform within each* Character Unit."

The Wind Farm Site is located within Area H: East Mayo Uplands, and described as "*low-lying lakeland drumlins around the shores of Lough Conn and Lough Cullin, to rugged hill country where it forms the foothills at the southwestern end of the Ox Mountains."*

Critical landscape factors of this character unit are steep slopes, prominent ridge lines, and localised lake vistas (of Lough Conn and Lough Cullin).
"The main concern for natural linear features such as lakeshores, coastlines, and ridgelines is to avoid penetration by development that will interrupt and reduce the integrity of such elements. Given the low viewing points around the Loughs, visual intrusion by development is likely to be enhanced."

Within the Study Area, there are the following landscape character units:

- Eastern periphery of Unit D: North Coast Plateaux, with the critical landscape factors of elevated coastal vistas, smooth terrain and low vegetation.
- Area G: North Mayo Drumlins, with the critical landscape factors of undulating topography, shelter vegetation, prominent ridgelines, and localised lake vistas
- Northern edge of Area K: East-Central Drumlin Spine, with the critical landscape factors of undulating topography, shelter vegetation, prominent ridgelines, and localised lake vistas.

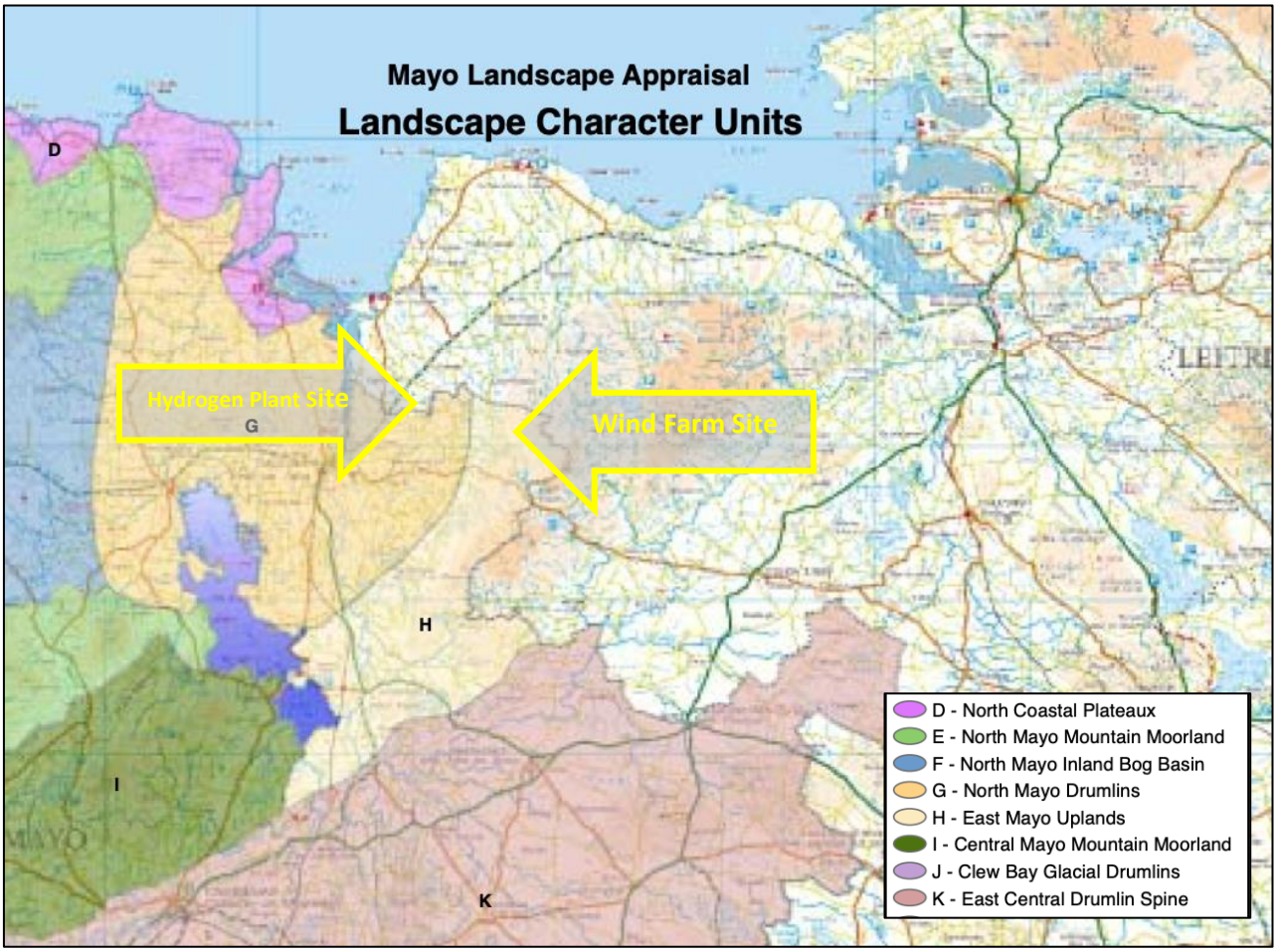

Figure 12.7: Landscape Character Units relative to the Development, derived from Mayo Landscape Appraisal

The following sections of the landscape appraisal are used to define landscape protection policy areas and a sensitivity matrix. This is integral to Chapter 10 of the CDP, which outlines the Natural Environment. The below 'Landscape Protection Policy Areas' map is used to assess the development impact of different development types in conjunction with the Landscape Sensitivity Matrix.

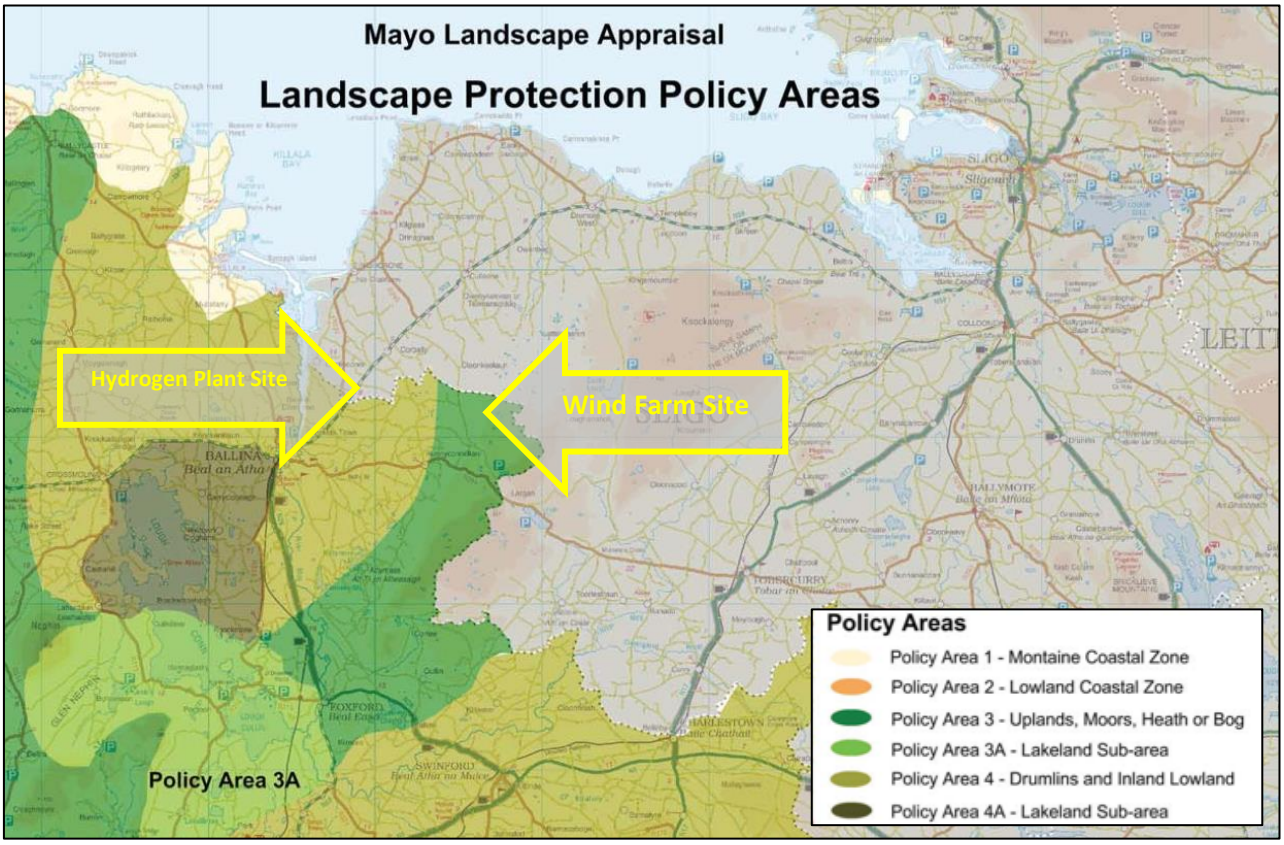

Figure 12.8: Map 10.1 Landscape Protection Policy Areas relative to the Proposed Development, derived from Mayo County Development Plan 2022-2028, Volume 1 Written Statement

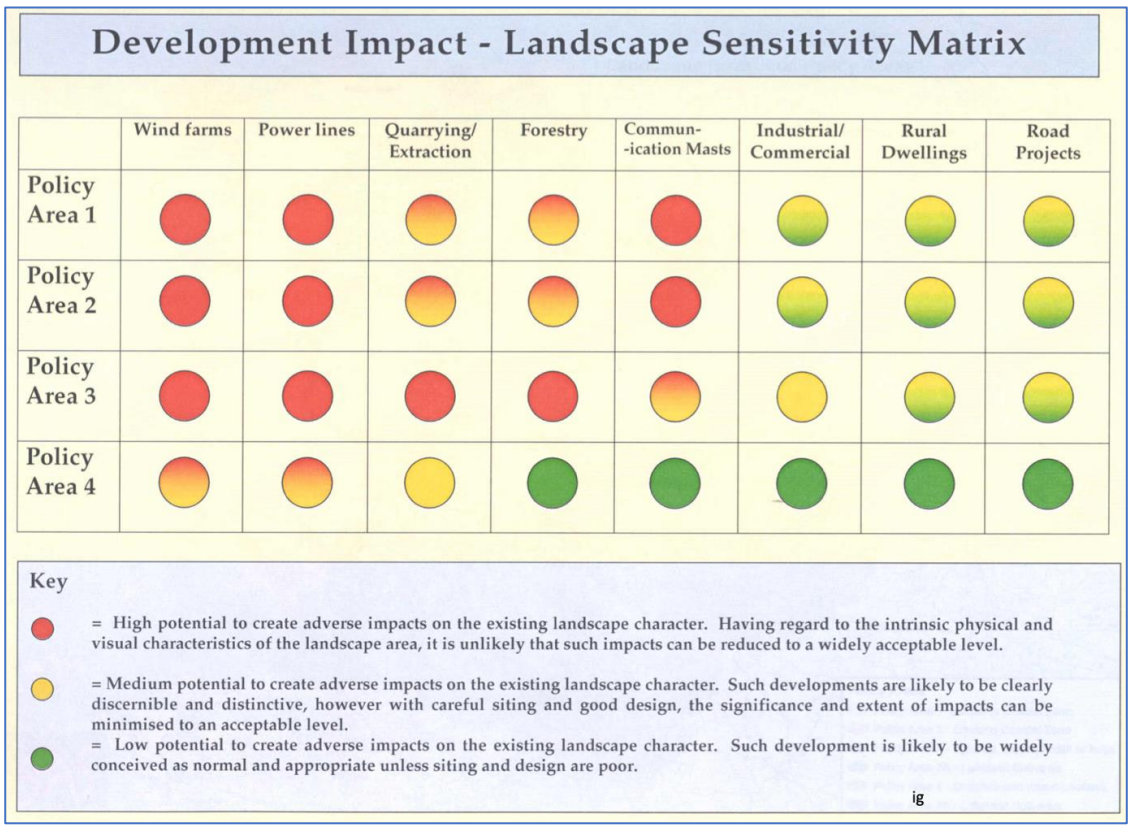

Figure 12.9: Landscape sensitivity matrix, derived from Mayo County Development Plan 2022-2028, Volume 1 Written Statement

The site is located within Landscape Policy Area 3 – Uplands, moors, heath or bogs, with the description of *"distinctive and vast areas of the County form a single policy unit due to the similar visual characteristics of smooth topography, limited shelter vegetation, often steep slopes and prominent ridge lines, rendering this policy unit similar suitability to absorb development"*

The Study Area also overlays landscape protection policy areas:

- Policy Area 1: Montaine Coastal Zone
- Policy Area 3A – Lakeland Sub-policy Area
- Policy Area 4: Drumlins and Inland Lowlands
- Policy Area 4A – Lakeland Sub-policy Area

As can be seen above, policy areas 1 and 3 experience a 'high potential for wind farms to create adverse impacts on the existing landscape character' where 'it is unlikely that such impacts can be reduced to a widely acceptable level'. Policy area 4 is located between high/medium and medium, however the Wind Farm Site is not located within this character area, however this is representative of the wider landscape context.

Views and Prospects are identified on the following maps, and the below policy and objectives apply to landscape and visual, as listed in Chapter 10: Natural Environment (Section 10.4.8 Landscape).

> ***NEP 14*** *To protect, enhance and contribute to the physical, visual and scenic character of County Mayo and to preserve its unique landscape character.*
>
> ***NEO 25*** *To consider applications for development, along Mayo's' Scenic routes, that can demonstrate a clear need to locate in the area concerned, whilst ensuring that it:*
>
> - *Does not impinge in any significant way on the character, integrity and distinctiveness of the area.*
> - *Meets high standards in siting and design.*
> - *Contributes to and enhances local landscape character.*
> - *Satisfies all other criteria, with regard to, inter alia, servicing, public safety and environmental considerations.*
>
> *Rural housing applications along Scenic Routes must comply with the requirements set out in Objective RHO 3 (Chapter 3).*
>
> ***NEO 27*** *To ensure all development proposals are consistent with the Landscape Appraisal of County Mayo and the associated Landscape Sensitivity Matrix and future editions thereof.*

NEO 28 *To review the Landscape Appraisal for Mayo and update this plan, as appropriate, following publication of the statutory guidelines for Planning Authorities on Local Landscape Character Assessments, as detailed in the National Landscape Strategy 2015-2025 and ensure consistency with the provisions of RPO 4.16 and RPO 5.2(b) of the RSES, 2020-2032.*

NEO 29 *Require a Landscape/Visual Impact Assessment to accompany significant proposals, located within or adjacent to sensitive landscapes, where appropriate.*

As there are some minor discrepancies within the two, the more detailed Map 3.1 'Rural Areas Under Strong Urban Influence & Scenic Routes and Views' will be used preferentially. The following three categories are listed in relation to this map within Chapter 3:

Category 1 - Scenic Routes: *These are public roads passing through or close to areas of outstanding natural beauty, or places of interest, showcasing the unique landscape character and natural environment of Mayo, which would have a low capacity to absorb new development.*

Category 2 - Scenic Routes Scenic Views: *These are locations along Mayo's Scenic Routes that offer the most advantageous locations to view to and from areas of outstanding natural beauty and / or places of interests, which would have an extremely low capacity to absorb new development.*

Category 3 - Coastal Areas / Lakeshores: *These are areas along Mayo's coastline and larger lakeshores that tend to be open in character, highly visible with intrinsic scenic qualities which have an extremely low capacity to absorb new development.*

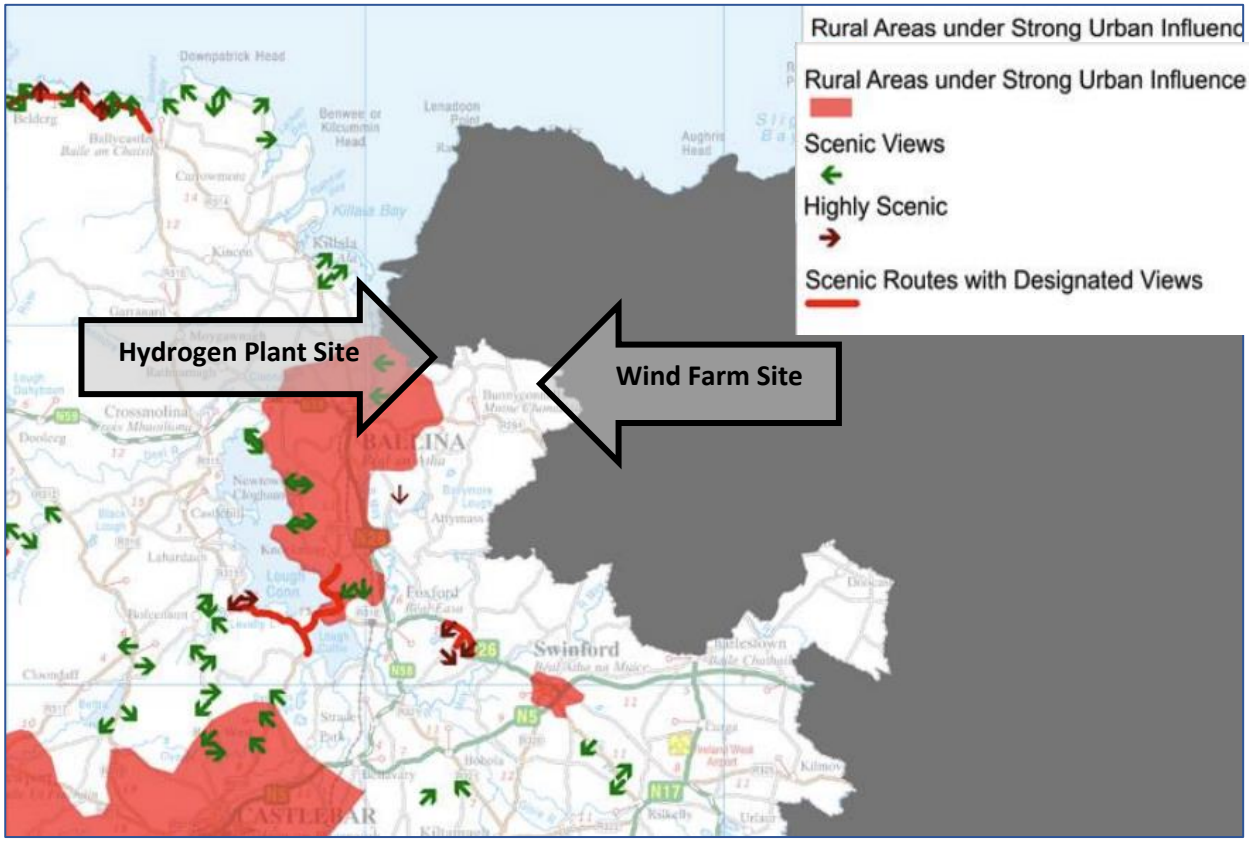

Figure 12.10: Map 3.1 derived from Mayo County Development Plan 2022-2028, Volume 1 Written Statement (Chapter 3 – Housing)

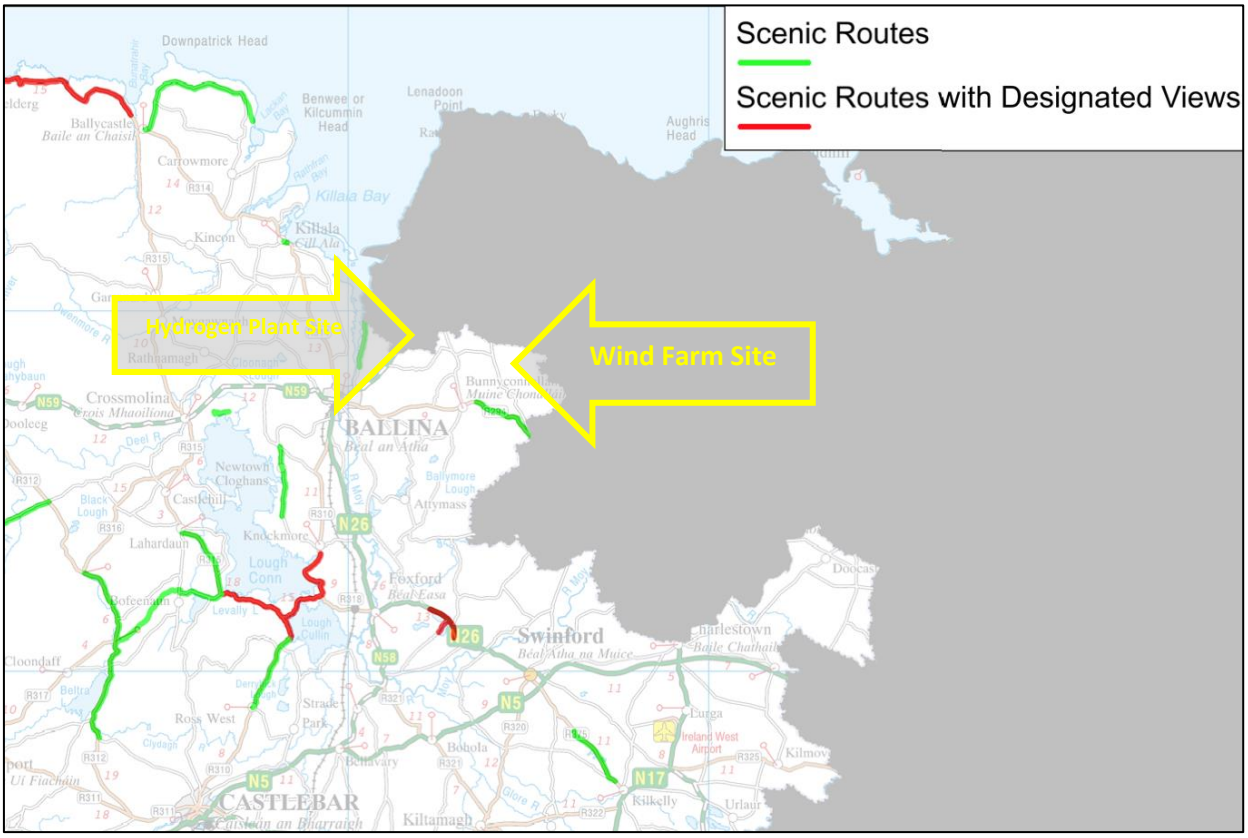

Figure 12.11: Map 10.2 Scenic Views and Prospects, derived from Mayo County Development Plan 2022-2028, Volume 1 Written Statement (Chapter 10)

The following statements are derived from Volume 1, Written Statement, Chapter 11.7 – Renewable Energy, Section 11.7.5 Mayo Renewable Energy Strategy 2011-2020:

> ***"11.7.5 Mayo Renewable Energy Strategy 2011-2020*** *… The strategy also identifies areas most suitable for renewable energy developments in a tier system. Mayo County Council will commence the review and update the Mayo Renewable Energy Strategy within one year of adopting this plan"*
>
> ***"11.7.6 Wind Energy*** *Mayo County Council recognises the importance of onshore and offshore wind energy as a renewable energy source and its role in meeting Ireland's national energy targets. The Council will endeavour to continue to facilitate wind energy projects that accord with the Mayo RES, the Landscape Appraisal of County Mayo and relevant Section 28 ministerial guidelines…"*

Key Renewable Energy Policies within the Written Statement are:

> ***REP 1*** *To support Ireland's renewable energy commitments outlined in national policy by facilitating the development and exploitation of a range of renewable energy sources at suitable locations within the county, where such development does not have a negative impact on the surrounding environment (including water quality), landscape, biodiversity or local amenities to ensure the long-term sustainable growth of the county.*
>
> ***REP 3*** *To actively encourage and support the sustainable development, renewal and maintenance of energy generation infrastructure in order to maintain a secure energy supply, while protecting the landscape, archaeological and built heritage and having regard to the provisions of the Habitats Directive.*
>
> ***REP 7*** *To promote the harnessing of wind energy to contribute toward decarbonising County Mayo, including new emerging by-product markets.*

Key Renewable Energy Objectives within Chapter 11, Climate Action and Renewable Energy of the Written Statement are:

> ***REO 6*** *To ensure all renewable energy proposal comply with the provisions of the Mayo County Council Renewable Energy Strategy 2011-2022 (or as updated).*
>
> ***REO 7*** *To commence the review of the Mayo County Renewable Energy Strategy 2011-2022 within one year of adopting this plan and update as required in accordance with future legislative guidelines and consistency with the provisions of RPO 4.16 and RPO 5.2(b) of the RSES, 2020-2032.*

Additionally, REO 8, REO22 and REO23 where they relate to wind energy development in accordance with Government policy, Landscape Appraisal of County Mayo and the Wind

Energy Development Guidelines (2006) and Mayo Renewable Energy Strategy (including revisions) As well as to promote, efficient energy storage and infrastructure, as well as meeting the minimum renewable energy target, in accordance with planning, sustainability and future energy strategies.

Within the Mayo County Development Plan 2022 – 2028, Volume 2 Development Management Standards, Section 8.8.1 Wind Energy, outlines that planning applications will be considered/in compliance with *"DoEHLG Wind Energy Development Guidelines 2006 (including any new guidelines when issued) and the Renewable Energy Strategy for Mayo".* The Renewable Energy Strategy has not been revised from the 2011 – 2020 iteration reviewed below.

Within this Study Area, the Wind Farm Site is generally zoned Tier 1 – Preferred (Large Wind Farms), or Tier 2 – Open for Consideration in the County Mayo Wind Energy Strategy. Areas which are marked as higher sensitivity (and therefore not zoned for wind farm development) are the shorelines of the lakes, coastline, and skylines in upland areas. The different classifications of the wind energy strategy are defined below, as per section 6.4.1 of the wind energy strategy:

"6.4.1 Wind Energy – On-shore wind energy *Map 1 Wind Energy classifies potential areas for on-shore wind energy development. There are 4 classifications identified:*

- *Priority Areas are areas which have secured planning permission and where on shore wind farms can be developed immediately.*
- *Tier 1 – Preferred (Large Wind Farms) are areas in which the potential for large wind farms is greatest.*
- *Tier 1 – Preferred (Cluster of Turbines) are areas identified as being most suitable for smaller clusters of wind turbines (clusters of up to three to five turbines depending on site conditions and visual amenity).*
- *Tier 2 – Open for Consideration identifies areas which may be considered for wind farms or small clusters of wind turbines but where the visual impact on sensitive or vulnerable landscapes, listed highly scenic routes, scenic routes, scenic viewing points and scenic routes will be the principal consideration. The Tier 2 classification will be reviewed by the Council following a determination by EirGrid of grid infrastructure for the County.*

Any proposals for on-shore wind farm developments will be determined in accordance with the Wind Energy Development Guidelines (DoEHLG) 2006 or any subsequent guidelines and the requirements set out in Section 6.5

Section 6.5 of the WES 'Environmental Considerations and SEA Mitigation Measures' outlines considerations relating to the receiving landscape of Mayo:

> ***"6.5.14 Landscape*** *Renewable energy developments shall avoid sensitive and vulnerable landscapes, listed highly scenic views, scenic views, scenic viewing points and scenic routes where detailed visual analysis demonstrates that the development will have an adverse effect on those landscapes.*
>
> *Renewable energy developments shall be sited and designed to minimise the visual amenity of the surrounding area."*

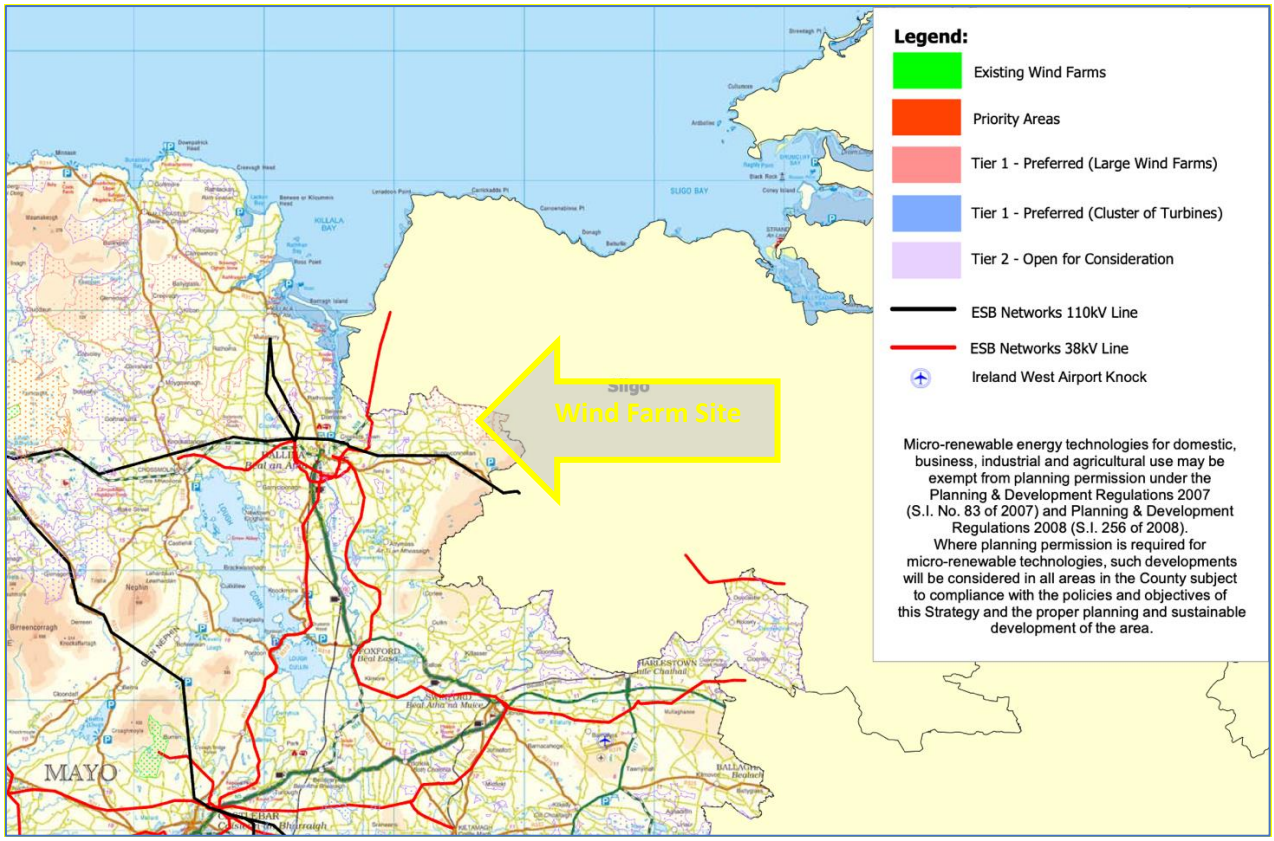

Figure 12.12: Map 1 – Wind Energy relative to the site, derived from Renewable Energy Strategy for Co. Mayo 2011–2020

12.3.6 Sligo County Development Plan 2017-2023

While the Wind Farm Site is located within Co. Mayo, the Hydrogen Plant Site is located within Co. Sligo. As can be seen on the below map (**Figure 12.13**) the Hydrogen Plant Site is located within close proximity to visually vulnerable areas and scenic routes, but generally within the normal rural landscape classification, defined as:

"areas with natural features (e.g. topography, vegetation) which generally have the capacity to absorb a wide range of new development forms – these are largely farming areas and cover most of the County. At the same time, certain areas located within normal rural landscapes may have superior visual qualities, due to their specific topography, vegetation

pattern, the presence of traditional farming or residential structures. These areas may have limited capacity for development or may be able to absorb new development only if it is designed to integrate seamlessly with the existing environment".

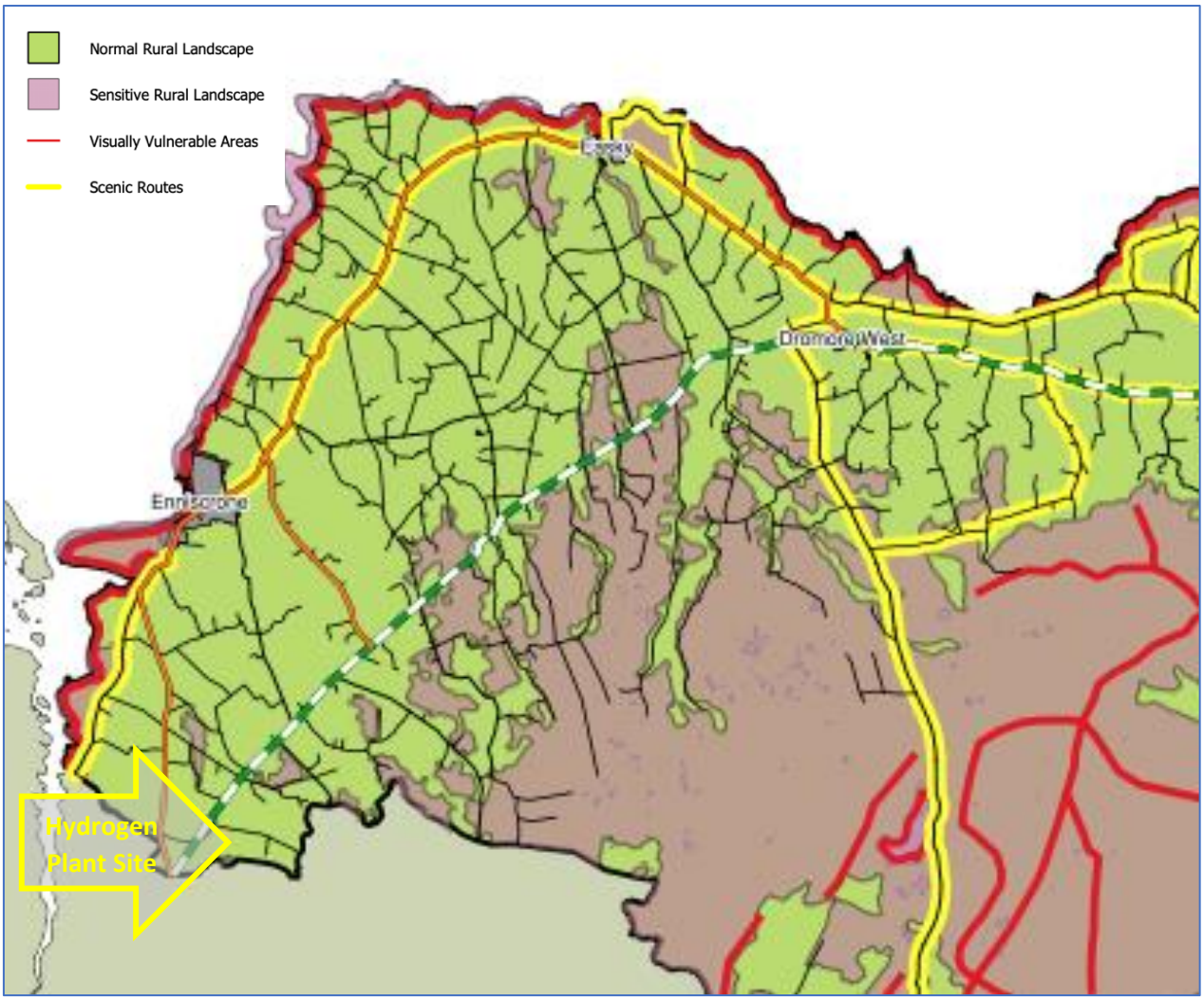

Figure 12.13 Excerpt from Sligo County Development Plan (2017 – 2023) - showing approximate location of proposed Hydrogen Plant Site in relation to scenic routes and different character areas

Scenic routes and visually vulnerable areas are also identified on this map, with scenic routes defined as:

"Scenic Routes: public roads passing through or close to Sensitive Rural Landscapes, or in the vicinity of Visually Vulnerable Areas, and affording unique scenic views of distinctive natural features or vast open landscapes. In addition to remote views, scenic routes have often a distinctive visual character conferred by old road boundaries, such as stone walls, established hedgerows, lines of mature trees, adjoining cottages or farmyards together with their traditional, planted enclosures etc., all of which warrant protection."

Within Chapter 7 – Heritage, the following landscape policies apply:

"P-LCAP-1 Protect the physical landscape, visual and scenic character of County Sligo and seek to preserve the County's landscape character. Planning applications that have the potential to impact significantly and adversely upon landscape character, especially in Sensitive Rural Landscapes, Visually Vulnerable Areas and along Scenic routes, may be required to be accompanied by a visual impact assessment using agreed and appropriate viewing points and methods for the assessment.

P-LCAP-2 Discourage any developments that would be detrimental to the unique visual character of designated Visually Vulnerable Areas.

P-LCAP-5 Protect the historic and archaeological landscapes of the County.

P-LCAP-6 Preserve the status of traditionally open/unfenced landscapes. Fencing in upland or amenity areas will not normally be permitted unless such fencing is essential to the viability of the farm and conforms to best agricultural practice. The nature of the material to be used, the height of the fence and, in the case of a wire fence, the type of wire to be used will be taken into account. Barbed-wire shall not be used for the top line of wire. Stiles or gates at appropriate places will be required.

P-LCAP-7 Where possible, preserve the open character of commonage and other hill land and secure access thereto"

12.3.7 Visual Baseline

Only those parts of the Study Area that potentially afford views of the Proposed Development are of interest to this part of the assessment. Therefore, the first part of the visual baseline is establishing a 'Zone of Theoretical Visibility' and subsequently, identifying important visual receptors from which to base the visual impact assessment.

12.3.7.1 Zone of Theoretical Visibility (ZTV)

Proposed Wind Farm ZTV

A computer-generated Zone of Theoretical Visibility (ZTV) map has been prepared to illustrate where the proposed Wind Farm Site 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 Study Area. As with the other sections of this report, there will be a distinction made between that relating to the Firlough Wind Farm Site and that relating to the Hydrogen Plant Site. The Firlough Wind Farm Site will be over a 20 km radius Study Area, and the Hydrogen Plant Site a 2 km radius Study Area (see **Section 12.1.2**).

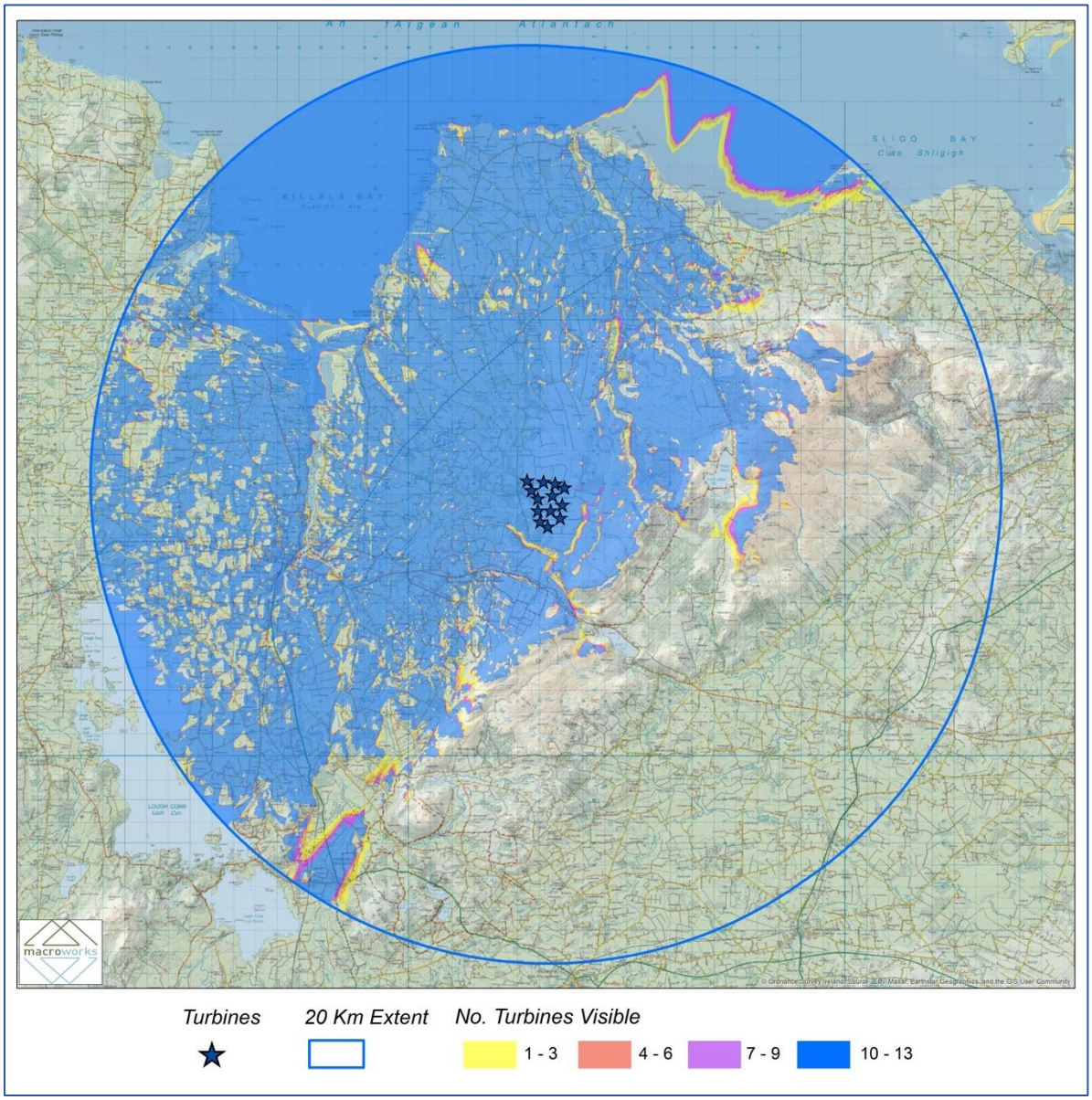

Figure 12.14: Bare-ground Zone of Theoretically Visibility (ZTV) Map.

The following key points are illustrated by the 'bare-ground' Wind Farm ZTV map (**Figure 12.14** refers):

- The visibility of the proposed Wind Farm Site varies greatly depending on the intervening landform, which, defined by the Ox Mountains, divides the Study Area along the northeast/southwest line to the southwest of the Wind Farm Site. The one exception to this is the higher sections of the Ox Mountains further east over Lough Easky.
- Within the northwest 'generally visible' two-thirds of the Study Area, the degree of visibility is (typically) binary between full and no visibility, with very few areas where there is an extensive transition of partial visibility.
- Within the immediate surrounds of the Wind Farm Site Farm, visibility is generally full, with serpentine low-no visibility sections following the Owenmore River and changes in

slope gradient to the immediate west of the site. To the north, the Easky River creates a screened corridor northwards to the coastline.

- To the west, over the open drumlin landscape, vicinity begins to break up towards the River Moy, decreasing to the main river corridor, before increasing again on the opposite bank. From Ballina and the River Moy to the outer west of the Study Area, the visibility is least consistent to the south and more uniform towards the north and the mouth of the River Moy
- From the site to the north of the Study Area along the coastline, is the most uniform area of high (generally full) visibility out to the coast at Lenadoon Point and Killala Bay. Around the coastline to the east, the degree of visibility is progressively pushed away from the coastline, and at Dromore West, begins to break up around the base of the Ox Mountains.

Proposed Hydrogen Plant ZTV

A computer-generated Zone of Theoretical Visibility (ZTV) map has been prepared to illustrate where the Hydrogen Plant is potentially visible from. Unlike the broad scale wind farm ZTV map which is based on a 20 km radius Digital Terrain Model (DTM), the more fine-grained Hydrogen Plant visibility analysis uses a ZTV that is based on Digital Surface Model data (DSM). The DSM model accounts for screening by both terrain and existing vegetation and it is generated from the main electrolyser building, which is the highest and most noticeable feature of the Hydrogen Plant Site (see **Figure 12.15**).

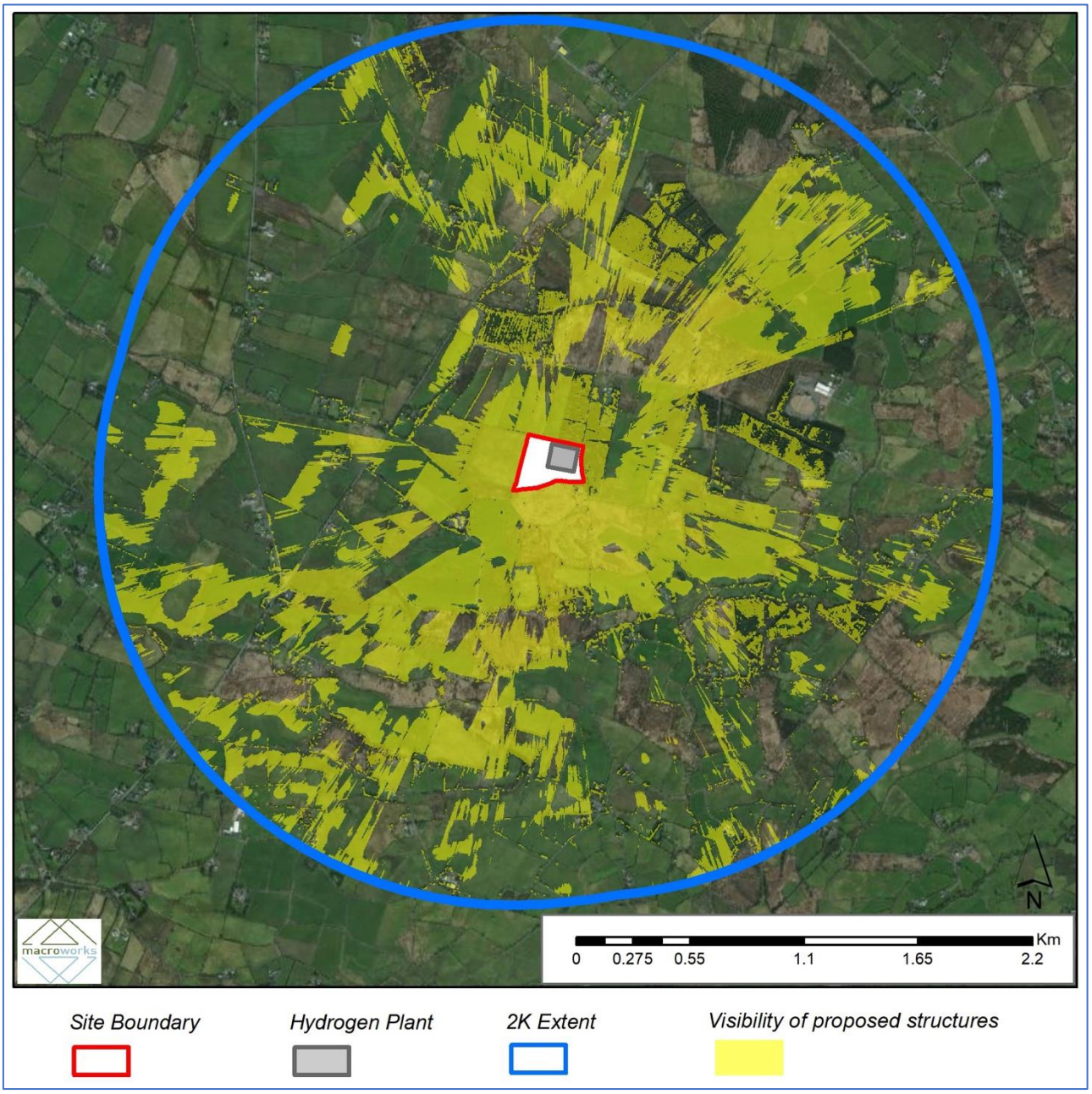

Figure 12.105: Hydrogen Plant Digital Surface Model ZTV Map indicating parts of the Study Area with potential views of the proposed Hydrogen Plant taking account of vegetation screening

The following key points are illustrated by the Hydrogen Plant ZTV map (**Figure 12.15** refers):

- Whilst the fields immediately around the Hydrogen Plant Site are afforded clear visibility of the proposed electrolyser building, this is unpopulated private land in agricultural and forestry use and thus, does not contain sensitive visual receptors.
- Once the visibility pattern strikes public roads and residences surrounding the Hydrogen Plant Site, it indicates sporadic and intermittent visibility – likely of the upper profile of the electrolyser building above and between intervening section of terrain and vegetation. There are very few instances of open visibility.

- One section of the N59, due west of the Hydrogen Plant Site is shown to have brief viability of the proposed electrolyser building and as with other sections of surrounding roads with potential visibility, representative viewpoints and photomontages will be selected and prepared to aid the visual impact assessment and inform proposed mitigation if necessary.

12.3.7.2 Views of Recognised Scenic Value

Views of recognised scenic value are primarily indicated within County Development Plans in the context of scenic views/routes designations, but they might also be indicated on touring maps, guide books, road side rest stops or on post cards that represent the area. The relevant scenic designations contained in the Mayo and Sligo County Development Plans have been identified above in **Section 12.3.4 'Landscape Policy Context and Designations'**.

There are no scenic routes within the Hydrogen Plant study area so the principal focus hereafter are those that are relevant to the proposed Wind Farm. All of the scenic routes and views that fall inside the Wind Farm ZTV pattern (see **Figure 12.11 and Figure 12.13**) were investigated during fieldwork to determine whether actual views of the proposed Wind Farm Site might be afforded. Where visibility may occur, a viewpoint has been selected for use in the visual impact appraisal later in this chapter.

Table 12.6: Rational for selection of scenic designations within the relevant County Development Plans

Scenic View or Route Reference:	Relevance to visual impact appraisal?	VRP No.
Sligo Scenic Route 22 - R297 from Scurmore to Dromore West	Site is not within identified FOV, however identified for road and population receptors also.	VRP 1, VRP 2, VRP 3
Sligo Scenic Route 49 - Dromore West to Mullany's Cross (L2702, L4701 & L4702)	Site is located (generally) in direction of view over Easky Lough for VP10, and potentially within the Ox Mountain context for VP15.	VRP 10, VRP15
Sligo Scenic Route 53 - Coast road from Mayo County boundary at Rathmurphy northwards to its junction with R297 at Scurmore	Site is not within identified FOV, however identified for road and population receptors also	VRP 8
Mayo Scenic Route – R294 at Bunnyconnellan (removed from one scenic routes map)	Regional Road, plus (varied) scenic designation.	VRP 19, VRP20

12.3.7.3 Centres of Population and Houses

Unless where specifically referenced, all distances relate to the proposed Wind Farm site as there are no centres of population within the hydrogen plant study area. The largest centre of population in the Study Area is Ballina, located 12 km to the west of the Wind Farm Site along the banks of the River Moy. To the south, further inland along the River Moy, is Foxford, located 18.5 km southwest from the proposed Firlough Wind Farm Site. Also to the west of the Study Area is the settlement of Killala (17 km northwest of the Wind Farm Site). Smaller settlements identified on the Mayo settlement hierarchy map are Bunnyconnellan, 3.7 km southwest of the Wind Farm Site, Attymass and Knockmore, located 11 km and 17.7 km respectively southwest from the array.

Within Sligo, Tobercurry (17.5 km southeast of the Wind Farm Site) and Inishcrone (10 km northwest of the Wind Farm Site) are the largest settlements located within the Study Area. Additionally, Inishcrone is identified as having 'special tourism function'. Smaller villages within the north of the Study Area in Sligo (north of the Ox Mountains) are Easky (also holds 'special tourism function') and Dromore West. The others (Cloonacool, Aclare, Tourlestraun, Banada) are located south of the Ox Mountains.

There are clusters of residential development throughout the Study Area, which are focused around transport or landscape features with no services associated with them, as ribbons of residential addresses along roads and coastal or lough shorelines. There is a distributed rural population across the north and west of the Study Area, which intensifies towards Ballina and the coast. To the northeast, east and south, this reduces over the large areas of bog and the upland areas of the Ox Mountains. On the far side of the mountains the residential development intensifies to the south.

Nearest residences to the Wind Farm Site are located along the local roads to the west at spacings ranging from 200 m to 1 km+. Surrounding the proposed Hydrogen Plant Site, the residential pattern features a higher proportion of individual residences on rural lifestyle properties or as holiday accommodation towards the coast i.e., not associated with a farm or other rural land use.

12.3.7.4 Transport Routes

The principal transport route passing through the Study Area is the N59, which runs in a general north-east/southwest direction around the northern half of the Study Area between the Ox Mountains and the coastline to Ballina. From Ballina it turns east and out of the Study Area, while the N26 continues south to the southern tip of the Ox Mountains and out of the

Study Area at Foxford. There is one small section of the N58 at Foxford also. To the east, the N17 traces the perimeter of the Study Area, passing through Tobercurry. The N59 is the nearest national road to both the Firlough Wind Farm Site and Hydrogen Plant Site, located approx. 600 m east of the proposed Hydrogen Plant Site, and 5.3 km from the proposed Firlough Wind Farm Site.

There are regional roads connecting the wider Study Area to Ballina in the west, with only one (R294) across the Ox Mountains and the east of the Study Area. The R294 runs west-east across the Study Area (and the Ox Mountains) from Ballina to Tobercurry and out of the Study Area. The other regional roads are generally connected to/diverge from Ballina, or connect to national roads which do so. This includes the R314, which runs north from Ballina to Killala, the R310 which runs south from the N26 along Lough Conn, and the R297 which loops from the N59 at Dromore West, along the coast to Inishcrone and back to the N59 north of Ballina. The R298 connects the R297 to the N59 north of Inishcrone, and there is a small section of the R318 at Foxford, in the south of the Study Area. There is a dense network of local roads over the rolling rural landscape, accessing the distributed rural community, forming a network between the major routes. The Ox Mountains are the largest area with minimal road connectivity, save for the R294 south of the Wind Farm Site, and one local road which runs north-south from the N59 at Dromore West to the R294 at Mullany's Cross, on the southern side of the mountains.

12.3.7.5 Tourism, Recreational and Heritage Features

There are two main landscapes which are the focus of a variety of attractions through the Study Area and these are the coast and the Ox Mountains. The proposed Wind Farm , Hydrogen Plant, Grid Connection and Interconnector are all located within the transitional landscape between these features.

The Ox Mountains form the visual and physical backdrop to much of the Study Area, as well as covering a large area of land with a series of peaks and loughs. The Sligo Way long distance walking route weaves through the mountains from Lough Talt (which also features a number of picnic/scenic areas), north-east through forestry to Easky Lough. The walkway veers out towards the coast before turning to run along the foothills of the Ox Mountains near Easkey Bog. At the eastern edge of the Study Area, the walking route follows 'Ladies Brae' a scenic road with multiple picnic areas and viewpoints. As noted in the scenic views and classification of the landscape as sensitive rural – the unmodified nature of the most elevated sections of the Ox Mountains is highly valued for recreational and scenic (tourism) opportunities, however the lower slopes and periphery feature the majority of marked routes

within the Study Area. At the southern foothills near Foxford there are a number of loop trails, the same occurs around Bunnyconnellan. The Western Way begins (or ends) at Bunnyconnellan, heading northwest through Ballina and around the coast, passing through many of the features identified in the coastal category below.

The richness of the coast and the surrounding areas is exemplified by the presence of the Wild Atlantic Way (WAW) which enters the northern extent of the Study Area at Dromore West, and passes at its closest around Inishcrone, as it (generally) follows the R297 around the northwest of the Study Area to Ballina. From Ballina, the WAW runs north to Killala and out of the Study Area. There are WAW feature points within the study area at Aughris Head, Easky Pier, Inishcrone Pier, Ballina Quay, exiting the Study Area westwards towards Lacken Strand (marginally outside of the Study Area). Other features, not included in the Wild Atlantic Way, include (anti-clockwise along the coast) Dunmoran Strand, Pollnadivva Pier, the sea swimming pool - Poll Gorm, O'Dowd Castle, the partially eroded coastal ringfort and Storm Beach at Carrowhubbock South, Rosserk Friary, a cluster of features within Ballina, Mount Falcon Estate, Moyne Abbey, Ross Beach, and Rathfran Abbey on the far side of Killala Bay. Finally, on the far side of the Ox Mountains, the key attractions are the Marilyn hill of Knocknashee (330 m) to the east, and Callow Loughs to the south.

12.3.7.6 Identification of Viewshed Reference Points as a Basis for Assessment

The results of the ZTV analysis provide a basis for the selection of Viewshed Reference Points (VRP's), which are the locations used to study the landscape and visual impact of the Proposed Development in detail. It is not warranted to include each and every location that provides a view of this Proposed Development as this would result in an unwieldy report and make it extremely difficult to draw out the key impacts arising from the Project. Instead, a variety of receptor locations was selected that are likely to provide views of the proposed Wind Farm Site from different distances, different angles and different contexts.

The visual impact of a proposed Wind Farm Site is assessed using up to 6 categories of receptor type as listed below:

- Key Views (from features of national or international importance);
- Designated Scenic Routes and Views;
- Local Community views;
- Centres of Population;
- Major Routes; and
- Amenity and heritage features.

Where a VRP might have been initially selected for more than one reason it will be assessed according to the primary criterion for which it was chosen. The characteristics of each receptor type vary as does the way in which the view is experienced. These are described below.

Key Views

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

Designated Scenic Routes and Views

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

Local Community Views

This type of VRP represents those people who live and/or work in the locality of the Proposed Development, usually within a 5 km radius. Although the VRPs are generally located on local level roads, they also represent similar views that may be available from adjacent houses. The precise location of this VRP type is not critical; however, clear elevated views are preferred, particularly when closely associated with a cluster of houses and representing their primary views. Coverage of a range of viewing angles using several VRPs is necessary in order to sample the spectrum of views that would be available from surrounding dwellings.

Centres of Population

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

Major Routes

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

Tourism, Recreational and Heritage Features

These views are often one and the same given that heritage locations can be important tourist and visitor destinations and amenity areas or walking routes are commonly designed to incorporate heritage features. Such locations or routes tend to be sensitive to development within the landscape as viewers are likely to be in a receptive frame of mind with respect to the landscape around them. The sensitivity of this type of visual receptor is strongly related to the number of visitors they might attract and, in the case of heritage features, whether these are discerning experts or lay tourists. Sensitivity is also heavily influenced by the experience of the viewer at a heritage site as distinct from simply the view of it. This is a complex phenomenon that is likely to be different for every site. Experiential considerations might relate to the sequential approach to a castle from the car park or the view from a hilltop monument reached after a demanding climb. It might also relate to the influence of contemporary features within a key view and whether these detract from a sense of past times. It must also be noted that the sensitivity rating attributed to a heritage feature for the purposes of a landscape and visual assessment is not synonymous with its importance to the Archaeological or Architectural Heritage record.

The Viewshed Reference Points selected in this instance are set out in **Table 12.7** below and shown on the VP selection Map in the Photomontage Booklet. Viewpoints VP1 – VP22 were principally selected in relation to the proposed wind farm and VP23 - VP26 for the proposed Hydrogen Plant.

Table 12.7: Outline description of selected Viewshed Reference Points (see also VRP map in photomontage booklet attached to this application).

VRP No.	Location	Distance to Wind Farm Site (km)	Direction of view
VP1	R297 west of Easky	15.4 km	S
VP2	R297 at Leaffoney	12.75 km	S/SE
VP3	R297 at Carrowmarble and Dromore West	13.15 km	S/SW
VP4	N59 at Culleens	7.8 km	S
VP5	Killala Quay	16.7 km	E/SE
VP6	R314 at Ballinteean	14.3 km	E
VP7	Rosserk Friary	10.5 km	E
VP8	L2605 Rinroe	9.3 km	E/SE
VP9	N59 at Tullylinn	5.4 km	SE
VP10	Sligo Way north of Lough Easky	8.2 km	E
VP11	N59 at Corballa	5.8 km	E
VP12	Local Road at Carrowleagh	1 km	E
VP13	L6612 Local Road at Carrowleagh	0.75 m	E
VP14	Sligo Way at Meenagleragh/Meenamaddo	5.5 km	W
VP15	Local Road at Mullaun near Lough Rumduff	8.7 km	E
VP16	Castlefield Manor, Ballina	11.4 km	E
VP17	Local Road at Carrownalogh, Glenree River	3.45 km	E/NE
VP18	Local Road at Glenree	750 m	NE
VP19	Western Way near R294 at Drumsheen	3 km	N
VP20	R294 at Windy Gap	3.4 km	N
VP21	N26 at Tonybaun	14.4 km	NE
VP22	N26 at Sraheen	17.5 km	NE
VP23	Local road north of Hydrogen Plant Site at Carraun	0.36 km	S
VP24	Local road north-east of Hydrogen Plant Site at Knockbrack	0.47 km	SW
VP25	N59 west of Hydrogen Plant Site at Carraun	0.71 km	E
VP26	Local road south of Hydrogen Plant Site at Dooyeaghny	0.93 km	N

12.3.8 Cumulative Baseline

Within the Study Area there are a number of existing wind farms and most of these are contained on the peatland plateau that forms the gentle northwestern transition from coastal farmland into the Ox Mountains. This is the same context of the proposed Wind Farm Site and therefore, the existing cumulative wind farms stretch both north-east and southwest of the site along the foothills of the ranges. The two exceptions to this pattern are the small (2 turbine) Lackan Wind Farm near the coast at Inishcrone and the six turbine Killala Wind Farm

that lies just on the landward side of this coastal settlement in the northwest of the Study Area.

Table 12.8: Cumulative Wind Farms within the Study Area (as of June 2023)

Wind Farm Name	Number of Turbines	Distance and Direction from the Wind Farm Site	Status
Carrowleagh	13	Adjacent to the east	Existing
Carrowleagh Extension	4	Adjacent to the east	Existing
Stockane Community Led Wind Energy Project	1	1.1 km north-east	Permitted
Black Lough	6	1.3 km north-east	Existing
Bunnyconnellan East	1	3.5 km south-west	Permitted
Bunnyconnellan	12	5 km south	Existing
Duneill	13	11 km north-east	Existing
Kingsmountain	10	12 km north-east	Existing
Lackan	3	12 km northwest	Existing
Killala	6	17 km northwest	Existing

12.4 ASSESSMENT OF POTENTIAL EFFECTS

12.4.1 Do Nothing Effects

In this instance the do-nothing effect would be that the receiving landscape stays in the same or similar condition as it currently is, but gradually begins to regenerate with vegetation as peat harvesting ceases and drains become blocked reducing the degree of dewatering that currently occurs. This will occur to a similar degree with or without the proposed Firlough Wind Farm.

The proposed Hydrogen Plant Site is likely to remain in productive agriculture in a do-nothing scenario.

12.4.2 Landscape Impacts

Landscape impacts are assessed on the basis of landscape sensitivity weighed against the magnitude of physical landscape effects within the sites and effects on landscape character within the wider landscape setting. The wider setting of the Hydrogen Plant Site is its 2 km radius study area, whereas the wider setting of the proposed Wind Farm Site is considered in respect of the immediately surrounding landscape (<5 km) as well as the broader scale of the Study Area (5-20 km).

12.4.2.1 Landscape Character, Value and Sensitivity

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.

Firlough Wind Farm Central Study Area (<5 km)

The central Study Area of the proposed Wind Farm Site is one of the most robust parts of the Study Area in landscape character terms especially in the context of the proposed wind energy development. It is characterised by large scale, but low intensity land uses that are synonymous with marginally productive upland transitions throughout the country. These land uses include extensive conifer plantations, cutaway (and some intact) peatland, marginal grazing and wind energy developments. There is sense of rural remoteness aided by the low degree of residential development. In terms of more sensitive naturalistic character, there are some areas of intact peatland as well as small watercourses and loughs.

In terms of landscape and scenic designations within the Mayo and Sligo County Development Plans which are both relevant to the central Study Area, the Mayo County Development Plan does not assign specific sensitivity judgements to landscape units. Instead, it relies on a general matrix of land uses vs landscape policy areas, which indicates that the Wind Farm Site is contained in an area that is not particularly compatible with wind energy development. However, this matrix is derived from a Landscape Character Assessment that is 20 years old and has long since been superseded by a more recent and finer grained Renewable Energy Strategy that has identified the Wind Farm Site as being appropriate for large wind farms. On the Sligo side of the central Study Area, much of the cutaway peatland area has been assigned 'sensitive rural landscape' status. However, this appears to be a land cover related designation that is applied to all peatland areas of the County on a broad-brush basis and it is not accepted that this is a particularly rare or remarkable setting in landscape character terms. There is one scenic route to the south of the Wind Farm Site along an elevated section of the R294 and this affords broad elevated views towards the coastline, which contains the plateau of forestry and wind farms in the near middle ground.

On the basis of the resins outlined above, the central Study Area is considered to have a **Medium-low** degree of Landscape Sensitivity.

Wider Wind Farm Study Area (5 -20 km)

The wider Wind Farm Study Area is extremely varied in terms of landscape character and sensitivity and this is generally well reflected in the Landscape Character Assessments of the Mayo and Sligo County Development Plans. Essentially it is the Mountains and the coastlines that are the most distinctive and sensitive landscapes where naturalistic character and value are layered with scenic and recreational value also. The Ox Mountains contain the southeastern quarters of the Study Area and contain a series of scenic waterbodies (Lough Talt and Easky Lough) as well as the Sligo Way long distance walking route. Whilst the central and southeastern portions of the Ox Mountains do not afford views towards the Wind Farm Site, the northwestern slopes afford elevated but often distant views over the peatland / forestry / wind farm context of the central Study Area.

The coastal context is discrete from the proposed Wind Farm Site in terms of distance and context being generally more than 12 km away from the Wind Farm Site. It is a popular section of coastline for holiday makers and surfers, particularly during the summer months and there is a series of beaches between rocky shorelines and low sea cliffs. The River Moy is synonymous with Salmon fishing at an international level making the settlement of Ballina, which straddles the river and features the world famous 'Ridge Pool' fishing spot, a popular tourist draw. There are also several heritage features on the River Moy between Ballina and Killala, including Rosserk Friary and Moyne Friary. To the west of the River Moy is relatively unremarkable drumlin farmland except for Lough Conn, which is a substantial water body.

In terms of landscape and scenic designations, the Ox Mountains, the coastal setting and river corridors are generally assigned higher landscape sensitivity judgements and have the highest concentration of scenic designations within the relevant County Development Plans. The fact that Sligo County Council assign 'Sensitive Rural Landscape' designations to all peatland areas within the county, is not necessarily reflective of distinctive or highly valued landscape character.

Overall, it is considered that the wider Study Area has a general landscape sensitivity of **Medium**, but with coastal, mountain, Lakeland and river corridors areas that have High sensitivity. There are also typical farmland and urban areas where landscape sensitive is Medium-low.

Hydrogen Plant Site Study Area (2 km))

The Study Area of the proposed Hydrogen Plant Site is contained in rolling pastoral farmland defined by scrubby and treelined hedgerows and interspersed with farmsteads and rural

dwellings. There is a patch of scrubby peatland, which appears to have been at least partially cutaway for domestic purposes before reverting to vegetation. There are also areas of commercial conifer plantations at various stages of rotation. The busy N59 corridor also influences the landscape character. Whilst the patch of scrubby peatland that lies to the south of the Hydrogen Plant Site and traverses the Mayo and Sligo borders is identified (on its Sligo side only) as a 'Sensitive Rural Landscape', it is considered that this might be better termed sensitive land cover as it is a typical and unremarkable feature in landscape character term within this part of the country. It does not strongly influence the landscape sensitivity judgement assigned to the Hydrogen Plant Site Study Area herein, which is deemed to be **Medium-low**.

12.4.2.2 Magnitude of Landscape Effect

Proposed Wind Farm

The physical landscape as well as the character of the proposed Wind Farm Site and its central Study Area (<5 km) is affected by the proposed wind turbines as well as ancillary development such as access and circulation roads, Turbine Hardstands, borrow pits, Interconnector, Grid Connection and the Wind Farm Substation compound. By contrast, for the wider landscape of the Study Area, landscape impacts relate exclusively to the influence of the proposed turbines on landscape character. The aspects of the proposed Wind Farm Site that are likely to have an impact on the physical landscape and landscape character are described in **Chapter 2: Project Description** with construction processes described in the Construction and Environmental Management Plan (CEMP) at **Appendix 2.1**.

Construction Stage

It is considered that the proposed Wind Farm Site will have a modest physical impact on the landscape as none of the proposed features have a large 'footprint' and the Wind Farm Site already consists of modified ground in the form of cutaway peatland. The topography and land cover of the Wind Farm Site will remain largely unaltered with construction being limited to Wind Farm site access roads, Turbine Hardstands, the Wind Farm Substation compound, the Interconnector, Grid Connection and Wind Farm Site Temporary Site Construction Compound. Excavations will tie into existing ground levels and will be the minimum required for efficient working. Any temporary excavations or stockpiles of material will be re-graded to marry into existing site levels and reseeded appropriately in conjunction with advice from the project ecologist.

The finalised internal Wind Farm Site access road layout has been designed to take advantage of the existing road and track network within the cutaway bog, which is generally

laid out in a grid. The track network has also been designed to avoid environmental constraints, and every effort has been made to minimise the length of new internal roadways. Because this is a relatively flat cutaway peatland site with extensive existing track network there will not be excessive 'cut and fill' required for road and hard stand construction. There will be an intensity of construction stage activity associated with the turbine access tracks and Turbine Hardstands consisting of the movement of heavy machinery and materials, but this will be temporary/short term in duration and transient in location. The construction stage effects on landscape character from these activities will be minor.

There will be one 110 kV on-site Wind Farm Substation constructed to collect the generated power from the proposed Wind Farm before connecting to both the proposed Hydrogen Plant Site at Knockbrack via the proposed Interconnector some 6 km to the west and directly to the national grid at the 110 kV loop-in underground cable via the proposed Grid Connection around 3.5 km to the south-west. The proportion of power diverted to the Hydrogen Plant Substation or the national grid will vary depending on fluctuating commercial demands and is not particularly relevant to the LVIA once the subsurface grid connections have been constructed and reinstated. All of these connections will take place under the existing road network using a temporary and transient trenching method. Once each section of cable route has been laid, the road surface will be re-laid to existing or improved standards and aside for occasional surface joint bays there will be almost no surface expression from the underground cable network. The exception will be the two tie-in towers that occur where the Grid Connection breaks the existing 110 kV line. These will add to the scale and intensity of electrical transmission infrastructure associated with the 110 kV Glenree – Moy overhead line, but they are consistent in nature with the existing lattice towers on sections of this overhead line.

The Wind Farm Substation will be located just north of the entrance road to the Wind Farm Site at its western side in an area of existing forestry – some of which will need to be felled to accommodate the Wind Farm Substation. Whilst this might slightly alter the intended felling regime it is only a temporal change in relation to harvesting that will take place at some stage in the future. The Wind Farm Substation will have a footprint of approximately 13,892 m^2 and will benefit in landscape and visual terms from the screening provided by the surrounding forest plantation to remain, such that it will only be noticeably visible within relatively close proximity. The most notable construction stage landscape impacts resulting from the Wind Farm Substation relate to the minor levelling of the site to form a level platform.

All Wind Farm Internal Cabling will be underground and will follow Wind Farm site access roads without the need for trenching through open ground. Indeed, the land cover of the Wind Farm Site will only be interrupted as necessary to build the structures of the proposed Wind Farm and to provide access. Impacts from land disturbance and vegetation loss at the Wind Farm Site are considered to be modest in the context of this cutaway peatland landscape setting.

Wind Farm Site activity will be at its greatest during the construction phase due to the operation of machinery on the Wind Farm Site and movement of heavy vehicles to and from the Wind Farm Site. This phase will have a more significant impact on the character of the Wind Farm Site and cable routes than the operational phase, but it is a 'short-term' impact that will cease as soon as the Wind Farm is constructed and becomes operational (approximately 18 months from the commencement of construction).

There will be some long term/permanent construction stage effects on the physical landscape in the form of Turbine Foundations and Turbine Hardstands, Wind Farm Site Access Roads and the Wind Farm Substation, but only the Wind Farm Substation is likely to remain in perpetuity as part of the national grid network. It is likely that with the exception of residually useful Wind Farm site access roads, all other development features will be removed from the Wind Farm Site and it will be reinstated / restored to the prevailing land cover as part of the proposed decommissioning process. Thus, the construction stage landscape effects of the Wind Farm Site are largely reversible.

There will be some construction stage effects on landscape character generated by the intensity of construction activities (workers and heavy machinery) as well as areas of bare-ground and stockpiling of materials as identified in the Construction and Environmental Management Plan (CEMP). Such effects will be temporary/short term in duration and are, therefore, not considered to be significant. Overall, construction stage landscape effects are considered to be of a **High-medium** magnitude within the site and its immediate surrounds (<1 km), diminishing to Medium and Low thereafter as ground-level construction activities become screened by intervening terrain and vegetation leaving the emerging wind turbines as the only noticeable element to influence landscape character.

Operational Stage Effects on Landscape Character

For most commercial wind energy developments, the greatest potential for landscape impacts to occur is as a result of the change in character of the immediate area due to the introduction of tall structures with moving components. Thus, wind turbines that may not have

been a characteristic feature of the area become a new defining element of that landscape character. In this instance, wind turbines are a characteristic feature of both the immediate and wider context where they generally form part of a district pattern of development that follows both the terrain and landcover pattern of the area. This band of wind energy development follows the peatland forestry plateau at the northwestern base of the Ox Mountains. Whilst it is a broad and elevated area, it does not constitute the foothills of the mountain range, but more a transition from gently rolling coastal farmland up to the mountains. The effect, therefore, is one of intensification and extension of an established land use in this landscape and not the introduction of a new and unfamiliar feature.

In terms of scale and function, the Wind Farm is well assimilated within the context of the central Study Area. This is due to the broad scale of the landform, landscape elements and utilitarian, but low intensity rural land use patterns. These attributes prevent the height and extent of the proposed Wind Farm causing the type of scale conflict that can occur in more intricate landscape areas. Although the Wind Farm represents an increased scale and intensity of built development than currently exists within and around the Wind Farm Site, it will not detract significantly from its productive upland rural character, within which wind turbines are already a defining feature of the landscape character.

It is important to note that in terms of duration, this Wind Farm Site proposal represents a long term, but not permanent impact on the landscape and is reversible. The lifespan of the Firlough Wind Farm is 40 years, after which time it will be dismantled and the landscape reinstated to prevailing conditions. Within 2-3 years of decommissioning there will be little evidence that a wind farm ever existed on the Wind Farm Site.

The decommissioning phase will have similar temporary impacts as the construction phase with the movement of large wind turbine components away from the Wind Farm Site. There may be a minor loss of roadside and trackside vegetation that has grown during the operational phase of the Wind Farm, but this can be reinstated upon completion of decommissioning. Areas of Turbine Hardstanding that are of no further use will be reinstated and reseeded to blend with the prevailing surrounding land cover of the time. It is expected that the decommissioning phase would be completed within a period of approximately 3 to 6 months.

In summary, there will be physical impacts on the land cover of the Wind Farm Site as a result of the proposed Wind Farm during the operational phase, but these will be relatively minor in the context of this productive rural landscape that comprises of existing wind energy

developments and extensive areas of commercial conifer forest. The scale of the Wind Farm will be well assimilated within its landscape context without undue conflicts of scale with underlying landform and land use patterns. For these reasons the magnitude of the landscape impact is deemed to be **High-medium** within the site and its immediate environs (c.1 km) reducing to **Medium** for the remainder of the central Study Area. Beyond 5 km from the Wind Farm Site, the magnitude of landscape impact is deemed to reduce to **Low** and **Negligible** at increasing distances as the Wind Farm becomes a proportionately smaller and integrated component of the overall landscape fabric.

Proposed Hydrogen Plant

Construction Stage

The construction stage landscape impacts from the proposed Hydrogen Plant Site will be similar in nature to those associated with the Wind Farm, but smaller in extent and more intensive within the Hydrogen Plant Site. These will also see physical landscape disturbances of almost the entire Hydrogen Plant Site as well as considerable excavation Hydrogen Plant Site for the foundations of the main electrolyser building. There will be temporary storage of excavated material and building materials, tower cranes, worker facilities and HGVs going to and from the Hydrogen Plant Site on a regular basis. Given the setback and enclosed nature of the Hydrogen Plant Site within the surrounding terrain and vegetation, much of the ground level construction stage activity will not be readily visible from the public realm and this will also reduce the perceived impact on landscape character during the construction stage.

At the site entrance to the proposed Hydrogen Plant there will be removal (and setback replacement) of short sections of roadside vegetation to allow for visibility splays. The new access road will require the demolition of a total of four sheds and a dwelling house as part of the Project. A roundabout will be provided a short distance in from the N59 serving the proposed new hydrogen plant access road, the existing laneway and the access to a replacement dwelling and shed that form part of the Project. These works will require the localised loss of some mature trees as well as land disturbance to form the proposed road as well as site preparation for the replacement house / shed. This aspect of the construction stage will be more conspicuous from the public realm than the proposed Hydrogen Plant itself. However, it represents localised and short term impacts of a similar nature to typical roadworks.

The construction phase will last 21 months and will therefore be a short-term impact of a **Medium** magnitude.

Operational Stage

Once operational, the proposed electrolyser building will present predominantly as a large storage building coloured agricultural green to match the typical tone of farm sheds. Notwithstanding, the fact that it is considerably larger than most farm sheds, it is also discreetly placed in its landscape setting such that it will be a notable built addition to the land use mix of the local area, but not an overt visual influence. When visible it is usually only a small section of the upper profile of the main Hydrogen Plant building that will be seen and its overall scale will not be apparent. While it will add to the scale and intensity of built development and is of an industrial character, its visual presence belies the scale of the facility.

Once operational, the proposed new entrance road configuration and roundabout will be a more intensive and formal piece road infrastructure than currently exists in this rural setting, but it is adjacent to the busy N59 road and is a very localised and consolidated change. The replacement house and shed that form part of the Project will not represent a material change to the baseline scenario other than being new build replacements of older structures.

Overall, the proposed Hydrogen Plant is considered to have **Medium-low** magnitude of landscape impact and only in its immediate context. Beyond approximately 1 km it will not have a notable bearing on landscape character.

12.4.2.3 Significance of Potential Landscape Effects – Proposed Wind Farm

The significance of landscape impacts is a function of landscape sensitivity weighed against the magnitude of landscape impact. This is derived from the significance matrix (**Table 12.3**) used in combination with professional judgement. The combinations of sensitivity and magnitude are summarised for the proposed Firlough Wind Farm Site in **Table 12.9** below and addresses the highest levels of anticipated impact for each of the identified landscape units i.e., the closest and most impacted portions.

Table 12.9: Significance of Landscape Effects (proposed Wind Farm Site)

Landscape Unit	Sensitivity	Magnitude	Significance (highest)
Ox Mountains	High	Low	**Moderate-slight**
Mayo / Sligo Coastline	High	Low-negligible	**Slight**
Rolling marginal farmland	Medium-low	Low	**Slight**
Central Study Area	Medium-low	High-medium / Medium	**Moderate**

12.4.2.4 Significance of Potential Landscape Effects – Proposed Hydrogen Plant

In terms of the significance of landscape effects for the proposed Hydrogen Plant Site, the combination of a Medium-low sensitivity judgement for its Study Area and a Medium-low magnitude of operational stage landscape impact are considered to result in a **Moderate-slight** significance of landscape effect. The magnitude of impact will be marginally higher (Medium) near the end of the construction phase when the main structures have emerged and construction machinery / workers are still on site, but given the short term duration, these effects are not considered to give rise to a higher overall significance judgement.

12.4.3 Visual Effects

In the interests of brevity and so that this chapter remains focussed on the outcome of the visual assessment (rather than a full documentation of it), the visual impact assessment from each of the 26 selected representative viewpoint locations has been placed into **Appendix 12.1**. This section should be read in conjunction with both **Appendix 12.1** and the associated photomontage set contained in a separate booklet accompanying the EIAR. A summary table is provided, which collates the assessment of visual impacts (**Table 12.10** below). A discussion of the results is provided thereafter.

Table 12.10: Summary of Visual Impact Assessment at Representative Viewpoint Locations (Appendix 12.1)

VP No.	Distance to nearest turbine / Hydrogen Plant Site	Visual Receptor Sensitivity	Magnitude of Visual Impact	Visual Impact Significance
VP1	15.4 km	**Medium**	Negligible	**Imperceptible / Neutral/ Long Term**
VP2	12.75 km	**Medium**	Low-negligible	**Slight-imperceptible/ Negative/ Long-term**
VP3	13.15 km	**High-medium**	Low-negligible	**Slight / Negative/ Long-term**
VP4	7.8 km	**Medium low**	Low	**Slight / Negative/ Long-term**

VP No.	Distance to nearest turbine / Hydrogen Plant Site	Visual Receptor Sensitivity	Magnitude of Visual Impact	Visual Impact Significance
VP5	16.7 km	**Medium**	Low-negligible	**Slight-imperceptible/ Negative/ Long-term**
VP6	14.3 km	**Medium**	Low	**Slight / Negative/ Long-term**
VP7	10.5 km	**High-medium**	Low-negligible	**Slight-imperceptible/ Negative/ Long-term**
VP8	9.3 km	**Medium low**	Negligible	**Imperceptible/ Neutral/ Long-term**
VP9	5.4 km	**Medium low**	Low	**Slight / Negative/ Long-term**
VP10	8.2 km	**High-medium**	Low	**Moderate-slight / Negative/ Long-term**
VP11	5.8 km	**Medium-low**	Low	**Slight / Negative/ Long-term**
VP12	1 km	**Medium-low**	Medium	**Moderate-slight / Negative/ Long-term**
VP13	750 m	**Medium-low**	Medium	**Moderate-slight / Negative/ Long-term**
VP14	5.5 km	**High-medium**	Low	**Moderate-slight / Negative/ Long-term**
VP15	8.7 km	**High**	Negligible	**Imperceptible / Neutral/ Long-term**
VP16	11.4 km	**Medium-low**	Low	**Slight /**

VP No.	Distance to nearest turbine / Hydrogen Plant Site	Visual Receptor Sensitivity	Magnitude of Visual Impact	Visual Impact Significance
				Negative/ Long-term
VP17	3.45 km	**Medium-low**	Medium-low	**Moderate-slight / Negative/ Long-term**
VP18	750 m	**Medium-low**	High-medium	**Moderate/ Negative/ Long-term**
VP19	3 km	**High-medium**	Medium	**Moderate/ Negative/ Long-term**
VP20	3.4 km	**High-medium**	Medium	**Moderate/ Negative/ Long-term**
VP21	14.4 km	**Medium-low**	Low	**Slight/ Negative/ Long-term**
VP22	17.5 km	**Medium-low**	Low-negligible	**Slight-imperceptible/ Negative/ Long-term**
VP23	0.36 km	**Medium-low**	Negligible	**Imperceptible / Neutral/ Long-term**
VP24	0.47 km	**Medium-low**	Negligible	**Imperceptible / Neutral/ Long-term**
VP25	0.71 km	**Medium-low**	Negligible	**Imperceptible / Neutral/ Long-term**
VP26	0.93 km	**Medium-low**	Negligible	**Imperceptible / Neutral/ Long-term**

12.4.4 Visual Impact summary

Whilst most often visual impacts are summarised by receptor type, in this instance the stratified division in the receiving landscape from mountains to the sea and east or west of the River Moy is a more logical division of visual receptor context. Thus, the visual impacts will be summarised in this fashion.

12.4.4.1 Visual Impacts from the coastal farmland context northwest of the N59

There were four representative viewpoints selected from this part of the Study Area and all of them sit on designated scenic routes from the Sligo County Development Plan, albeit the principal viewing direction and main aspects of visual amenity tend to be coastward in the opposite direction to the inland Wind Farm Site. The relevant viewpoints are VP1, VP2, VP3 and VP8.

The impacts from these distant viewpoints are unsurprisingly in the lower end of the range and vary between 'Slight' and 'Imperceptible' as the wind turbines tend to read as partial blade sets and blade tips above intervening vegetation against a backdrop of the Ox Mountains where wind turbines are already a characteristic feature. The highest impact 'Slight' is assigned to VP3 which is a sweeping elevated view along the northern slopes of the Ox Mountains and the coastal farmland. It is deemed to be a more sensitive view than the others, which are more clearly oriented away from the Wind Farm Site, and the proposed wind turbines are a more discernible addition to the wind energy provision along the transitional plateau to the northwest of the mountains. The proposed hydrogen plant will not be discernible from any of these viewpoints.

12.4.4.2 Visual Impacts from Ballina and west of the River Moy

There were six representative viewpoints selected from the western quarters of the Study Area beyond the distinctive River Moy corridor. These include VP5 and VP16 which represent two of the larger centres of population within the Study Area, Killala and Ballina respectively. The remainder (VP6, VP21 and VP22) tend to be within a rolling rural landscape context with the exception being VP7 at Rosserk Abbey on the banks of the River Moy.

Due to the combination of distance, screening and the more localised focus of the selected views to the west of the River Moy, the visual impacts recorded from them are very minor. The range of significance is between 'Slight' and 'Slight-imperceptible'. One of the more distinctive views from this part of the Study Area is VP5 from the pier at Killala, which takes in the Moy estuary and sand spit in the foreground of the view towards the Wind Farm Site and Ox Mountains. Another is VP7 from the ruins of Rosserk Abbey on the western banks of

the River Moy. Notwithstanding the slightly higher sensitivity judgements applied to these receptor locations, the overall significance did not exceed 'Slight-imperceptible' in both cases.

VP16 is the sole viewpoint used to represent the largest settlement within the Study Area – Ballina. This represents one of few locations where there is potential visibility of the proposed Wind Farm Site from Ballina which otherwise tends to hug the low lying corridor of the River Moy and where built development limits broad visibility. VP16 is from a slightly elevated residential housing estate in the north of the settlement where a green space allows relatively open views towards the distant Wind Farm Site when nearby existing turbines are already visible. The significance of effect was deemed to be 'Slight'. The proposed hydrogen plant will not be discernible from any of these viewpoints.

12.4.4.3 Visual Impacts from the N59

There were three Wind Farm Site viewpoints selected along the N59 (VP4, VP9 and VP11) and one Hydrogen Plant Site viewpoint (VP25), which will be addressed separately at **Section 12.4.4.6**. The N59 is a key receptor as it is the principal transport route through the Study Area and also serves to perceptually divide the coastal farmland context to its northwest from the marginal farmland / forestry / wind farm plateau to its southeast. The views in question are all towards the latter.

The inland views from the N59 were all very similar in context taking in a fore-to-middle ground of marginal farmland within gently rolling and rising terrain which then gave way to an apron of forestry and wind energy development at the base of the Ox Mountains. The significance of effects from seeing additional wind turbine blade sets rising within the same wind energy context of the vista was deemed to be 'Slight' in all three instances. One of the Hydrogen Plant views (VP25) from the N59 near Carraun affords a substantially screened middle distance glimpse of the roofline of the proposed Hydrogen Plant through intervening trees. The significance of visual impact is deemed to be Imperceptible, especially once proposed mitigation screen planting becomes established.

12.4.4.4 Visual Impacts from the central Study Area (within c. 5 km of the Wind Farm Site)

There are four representative viewpoints within the central Study Area to the west of the Wind Farm Site that address the scale and nature of visual change predicted in the local area. There are none throughout the eastern quarters of the central Study Area as this is largely unpopulated and contains few sensitive visual receptors.

The three closest views (VP12, VP13 and VP18), all have a very similar context of peatland/ cutaway peatland, commercial forestry plantations and wind energy developments, though the latter is not particularly overt. Whilst the plateau landform and land use context are broad in nature, the views are not particularly extensive and there is little sense of the coast or the Ox Mountains. In all three cases the proposed wind turbines present at a prominent scale and occupy a considerable proportion of the afforded views. However, they do this without great detriment to character of this landscape and the remote / utilitarian nature of the visual context. While the wind turbines certainly add to the scale and intensity of built development within these scenes, they do not unduly compromise the sense of rural remoteness. Consequently, the significance of effects only ranged between 'Moderate' and 'Moderate-slight', which is comparatively low for local views of commercial scale wind energy developments in an Irish context.

VP17 is from a slightly different context of marginal farmland and treelined hedgerows just to the west of the peatland / forestry plateau that contains the Wind Farm Site. The wind turbines present at a smaller scale from here through and between foreground treelines and the significance of impact is deemed to be 'Moderate-slight'.

The proposed hydrogen plant will not be visible from any of these views.

12.4.4.5 Visual Impacts from the Ox Mountains and foothills

There are five viewpoints that have been selected within the Ox Mountains context or more specifically from its north facing foothills where broad and elevated visibility across the peatland plateau of the central Study Area is afforded. The relevant viewpoints include VP10, VP14, VP15, VP19 and VP20. All of these lie in designated scenic routes from the Mayo or Sligo County Development Plans, except for VP14, which is on a remote section of the Sligo Way long-distance walking route.

VP10 provides possibly the best contextual view of the stratification of land form and land use between the Ox Mountains and the coastline. It is a sweeping view along the northern slopes of the mountain range, which then gives way to a zone of forestry, peatland and wind farms wherein the Wind Farm is also contained. Further to the northwest is marginal rolling farmland that transitions into broad and productive coastal farmland to the northwest of the N59 out to the coast. Within this contact the proposed Firlough Wind Farm Site is clearly visible, but in a highly legible manner that is consistent with the prevailing land use pattern. Notwithstanding, the sensitivity of this receptor, the significance of impact is deemed to be 'Moderate-slight'. There is no visibility of the Wind Farm from VP15, which lies further into the Ox Mountains on the same road as VP10 where it overlooks the highly scenic Easky Lough. This has been used as an 'illustrative' viewpoint.

VP19 and VP20 have a similar viewing context being from the same section of scenic route on the R294 that exits the Ox Mountains in a north-westerly direction. VP20 is slightly more enclosed within the mountains than VP19. Both views afford clear middle-distance visibility of the proposed wind turbines, which will rise to the fore and to the left of the Carrowleagh and Black Lough wind turbines, albeit noticeably taller than their existing counterparts. This visual relationship is not ambiguous in this context as it generates a strong sense of perspective that serves to separate the schemes and enhance the perception of space and distance in that section of the view. The significance of effect was deemed to be 'Moderate' in both instances and that related, in part, to the High-medium sensitivity both views were assigned.

From VP14, some of the proposed wind turbines will be visible through a forested saddle alongside existing Carrowleagh and Black Lough wind turbines. There will be a slight degree of ambiguity generated by the scale differential between the proposed and existing wind turbines, but all are clearly set in a productive rural context beyond the mountain range. The significance of impact is deemed to be 'Moderate-slight'.

The proposed Hydrogen Plant will not be discernible from any of these viewpoints.

12.4.4.6 Visual Impacts relating to the Hydrogen Plant Site

Four representative viewpoints (VP23, VP24, VP25 and VP26) were selected specifically in relation to the Hydrogen Plant Site which is visually discrete from the Wind Farm Site context. Indeed, there are none of the Hydrogen Plant Site viewpoints that afford clear views of the proposed Wind Farm or Wind Farm Site viewpoints that afford clear views of the proposed Hydrogen Plant Site. The selected Hydrogen Plant Site views are contained on the local roads and N59 that circulate the Hydrogen Plant Site.

12.4.5 Consideration of wind turbine dimension range

As a result of the recent Derryadd Wind Farm high court decision relating to the degree of flexibility for the likes of wind turbine dimensions that are put forward at planning stage, it is now considered necessary to be more specific in terms of the design envelope being applied for and to ensure that the full range is adequately assessed in the EIAR. For the landscape and visual assessment, the pertinent aspect of the design envelope relates to the turbine dimensions used to prepare the photomontages, upon which, the visual impact assessment is based.

In all previous wind energy projects before the high court decision, Macro Works have taken the approach of using the highest possible tip height and hub height combination. This is on the basis that a viewer who can see a hub rising above a skyline ridge is likely to feel they are seeing more of the turbine than when the hub is screened from view (i.e., in the case of a lower hub / longer blade combination). That premise is based on the hub being perceived as the key and central component of a turbine in a figurative sense. However, there is also some merit to the argument that a larger rotor diameter / lower hub balances out the higher hub / shorter blade scenario, especially as there is a trend towards rotor diameters getting proportionately greater over recent years. Therefore, in this instance, a different approach was taken where the specimen turbine used for the photomontages that informed the visual impact assessment employed the maximum tip height dimension of 185 m with a median hub height of 107.5 m and maximum rotor diameter of 155 m. The reason for this very subtle alteration in approach is that any variation from this specimen wind turbine, in the form of an adjusted rotor diameter / hub height ratio, will see a minimal departure from the specimen turbine dimensions and an immaterial impact on the results of the visual impact assessment.

In order to examine the full range of potential wind turbine dimensions and to illustrate the corresponding immaterial impact, Macro Works prepared comparative photomontages at three of the previously selected viewpoints (VP10, VP19 and VP20) to represent short and mid-distance views of the development in differing contexts. It was not considered necessary to use long distance views (10 km+) for this comparative exercise as any variation in turbine dimensions are even less likely to be read at longer distances. The comparative scenarios used include:

- Specimen Turbine – 107.5 m hub, 155 m rotor diameter, 185 m tip height (as used for the visual impact assessment herein)
- Alternative Scenario 1 – 102.5 m hub, 149 m rotor diameter, 177 m tip height (lowest hub height)
- Alternative Scenario 2 – 110.5 m hub, 149 m rotor diameter, 185 m tip height (highest hub height, shortest rotor diameter)

As can be seen from the comparative photomontages (contained at the end of the Photomontage Volume) the variation in turbine dimensions is very difficult to discern across the three scenarios even with considerable scrutiny. This is unsurprising as the variation in hub height is no more than 5 m from the specimen turbine position. There is also a potential 8 m departure from the specimen turbine in terms of tip height, but this would result a reduction in overall height (i.e., the visual impact would not increase). Whilst the variation in rotor dimeter is 6 m between the specimen turbine and Alternative scenario 2, this only translates as a variation of 3 m in blade length.

Regardless of whether the difference between the alternative turbine dimensions presented in the comparative photomontages can be discerned or not, it is clear that there is not a material difference in the level of visual impact between them and certainly not a higher impact than the base-case used for the submitted LVIA. Thus, the submitted LVIA is deemed to comfortably cover the range of potential turbine dimension options proposed and it is not considered necessary to prepare separate photomontages / assessments at all viewpoints for all possible turbine dimensions within the range.

12.4.6 Cumulative Impacts

Wind Farm Cumulative Impacts

The cumulative scenario with regard to other existing and permitted wind farms in the Study Area is a relatively simple one. That is, all of the cumulative wind farms in this area are existing, and have been accounted for, where relevant, as part of the baseline landscape and visual context in the impact assessments heretofore. The only minor exceptions to this scenario are two separate recent permissions for single turbine extensions to both Black Lough Wind Farm to the north and Bunnyconnellan Wind Farm and Bunnyconnellan East Eind Farm to the south of the Firlough Wind Farm Site. In this context it is not considered that the two single turbine extensions require cumulative consideration as separate developments (the two turbines in question are presented in the cumulative wireframe images within the Photomontage Volume).

There are both negative and ameliorating factors associated with wind energy development being a characteristic feature of the existing landscape context and these are outlined as follows.

In terms of cumulative visibility, the cumulative ZTV map (**Figure 12.16**) is very similar to the standalone ZTV map for the proposed Wind Farm Site, which is unsurprising as the cumulative turbines are contained in the same plateau landscape area as the proposed turbines. The fact that the proposed turbines are also taller than their existing counterparts tends to override any minor idiosyncrasies in the ZTV pattern relating to screening by localised terrain. In other words, there will almost always be potential to the proposed turbines in conjunction with the other turbines that stretch along the base of the Ox Mountains. The main area where only existing turbines will be visible is in the far north-east of the Study Area where the Duneill and Kingsmountain turbines are likely to be the only ones visible due to a subtle ridge of high ground that separate the Sligo Bay catchment from the Killala Bay catchment. There are also some smaller coastal areas around Inishcrone and Killala where only the coastal Lackan and Killala Wind Farms will be visible.

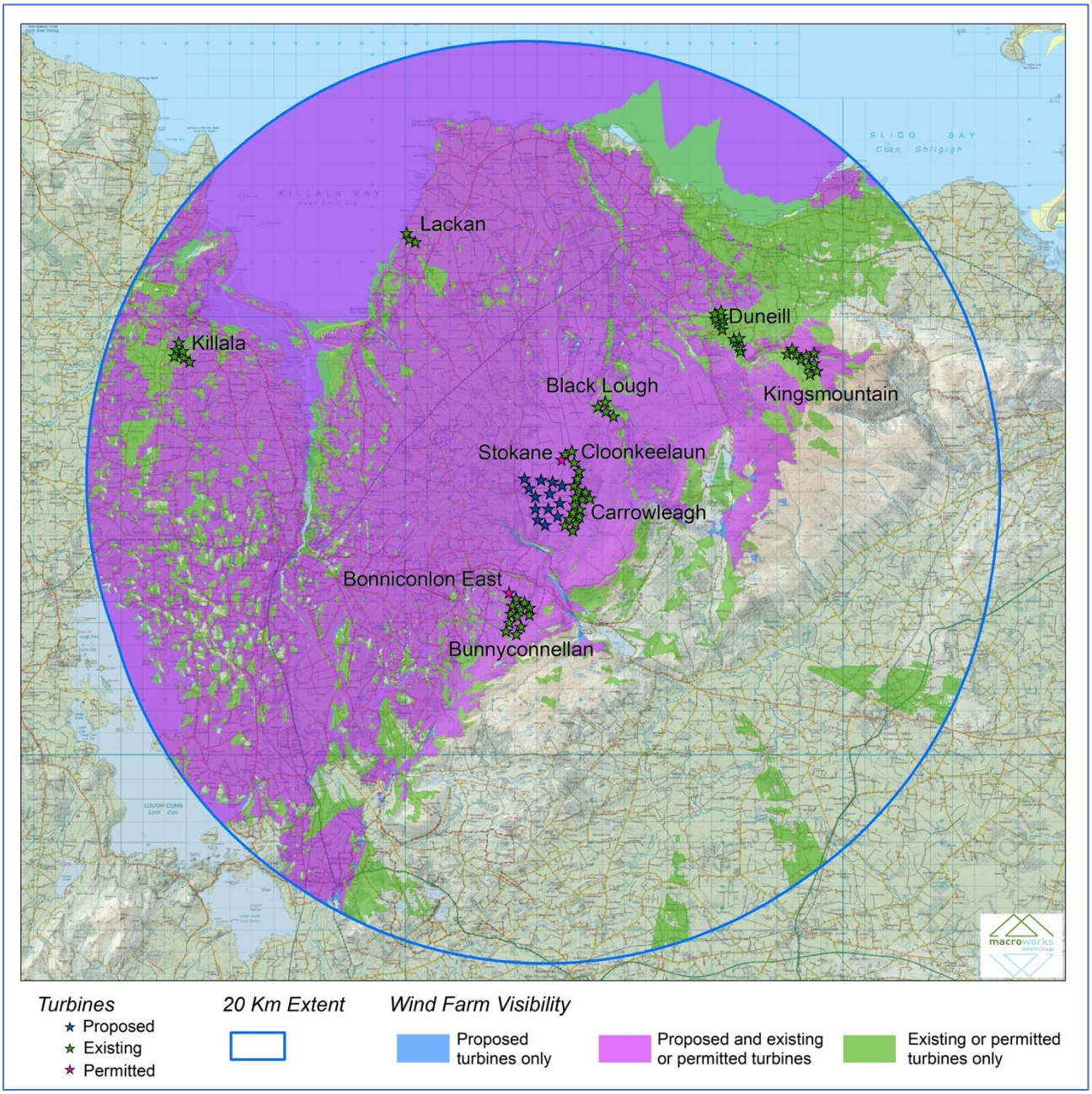

Figure 12.6: Cumulative ZTV Map

From a landscape impact perspective, the fact that wind energy development already forms part of both the immediate and wider context of the Study Area serves to make the effect of adding further wind turbines, one of intensification / extension rather than the introduction of a new and uncharacteristic feature that might depart or add unwanted diversity to the landscape setting. As described in the Magnitude of Landscape Effect section (**Section 12.4.2.2**), wind energy development in this area tends to form part of a district pattern of development that follows the peatland / forestry plateau at the northwestern base of the Ox Mountains. This has become a legible pattern for wind energy development in this area and given the extent of the plateau and the broad scale of its prevailing land use patterns, it is an

area where wind farms are well accommodated and assimilated in landscape character terms. The proposed wind turbines represent a c. 22% increase to the overall number of turbines that will exist along this plateau, i.e., from 58 to 71 turbines, but the area in question stretches around 25 km along the ranges and is around 10 km deep at its widest point. Thus, it is an extensive area and it is not considered that the proposed wind turbines represent a tipping point where wind turbines will become the predominant or most characteristic landscape feature. Instead, the Proposed Development will make wind energy development a more equal contributor to the landscape character of the plateau, which is currently dominated by peatland and forestry.

In terms of cumulative visual impacts, there were a number of instances where the visual relationship with surrounding wind farm (predominantly Carrowleagh, Black Lough, Bunnyconnellan and Bunnyconnellan East Wind Farms) was analysed in the context of the visual impact assessment contained in **Appendix 12.1** and summarised in **Section 12.4.4**. There were three main cumulative effects encountered and these were; increased intensity of wind energy development; the visual stacking of wind turbines from neighbouring developments when viewed on the same alignment, and; scale disparity between the smaller existing wind turbines and the taller proposed wind turbines.

The increased intensity of wind energy development in the visual setting is an inevitable by-product of placing more wind turbines into an area that is already characterised by the presence of wind energy development. However, for many of the same reasons outlined in relation to cumulative effects on landscape character, this is a landscape / visual setting that is broad enough to accommodate a number of wind farm developments, whilst maintaining a legible pattern of development. The Wind Farm Site is not considered to breach a threshold whereby, the number of wind turbines is deemed to be excessive or to dominate the other compatible land uses in this sparsely populated area.

Notwithstanding, that the increased intensity of wind energy development is not considered excessive, the proposed wind turbines will generate some visual clutter when seen on alignment with surrounding developments. This occurs most frequently when viewed from the north and north-eastern quarters of the Study Area where the proposed turbines are aligned with the adjacent Carrowleagh wind turbines and/or the upslope Bunnyconnellan wind turbines (i.e., VP3). The apparent clutter is greater from the north-east, because the nearer Carrowleagh wind turbines are of a more comparable scale and the blade sets will rotate in the same plain as the proposed wind turbines. Whereas, from western quarters, the greater height and nearer distance of the proposed wind turbines as well as the higher

elevation of the site combine to such that the blade sets are not overlapping. Instead, the higher proposed wind turbine blade sets rise well above the much less noticeable existing wind turbines (see VP12, VP13, VP16, VP17 and VP18).

Scale disparity between wind turbines from different wind farms can lead to the adverse effect of distance confusion. This tends to occur more often when smaller / nearer wind turbines are viewed to the fore of taller / further wind turbines and appear either closer together than they actually are or confuse the view in terms of the relative landscape context of each development. For the proposed Firlough Wind Farm, this only tends to occur within views from the east where there are few receptors (see VP3 and VP10) and given the considerable viewing distances all of the wind turbines in the area have a comparable scale and context. The converse scenario of the taller wind turbines to the fore, which occurs much more frequently for the proposed Wind Farm Site, is preferable because it tends to accentuate the scale of the landscape / depth of the vista and the sense of space and distance between the various developments.

Hydrogen Plant Site Cumulative Impacts

In relation to the proposed Hydrogen Plant Site within its own 2 km radius Study Area, there are no other developments (existing or proposed) of a comparable scale and nature and thus, it is not considered to contribute to noticeable cumulative impacts. However, it should be noted that the replacement of a demolished dwelling and shed that will be undertaken will be subject of a separate application that forms part of the overall Project. The associated impacts are addressed in section 12.4.2.2.

When the proposed Hydrogen Plant is considered in conjunction with the proposed and other existing wind farms within the broader wind farm Study Area there is very little potential for intervisibility. As can be seen from the four photomontages used to assess the visual impact of the proposed Hydrogen Plant Site, it has been deliberately located in a discreet and well screened portion of the landscape. None of those viewpoints afford any material combined visibility of the proposed Hydrogen Plant and the proposed Firlough Wind Farm.

For the reasons outlined above, the proposed Hydrogen Plant Site is not considered to contribute to cumulative impacts to any more than a **Negligible** degree.

Grid Connection and Interconnector Cumulative Impacts

Whilst there will be some construction stage cumulative effects relating to the Grid Connection and Interconnector being constructed at the same time as other elements of the

Project and the simultaneous construction activities involved. However, once operational the Grid Connection and Interconnector cables will have no noticeable above-ground presence with the exception of the loop-in end masts, that occur where the Grid Connection breaks the existing 110 kV line. These will add to the scale and intensity of electrical transmission infrastructure associated with the 110 kV Glenree – Moy overhead line, but they are consistent in nature with the existing lattice towers on sections of this overhead line. These elements of the Project will have a Negligible cumulative impact in combination with other project features and other forms of development within the study area.

12.4.6.1 Cumulative Impact Summary

Overall, it is considered that there will be notable cumulative impacts arising from the addition of the Wind Farm Site to the series of existing wind farms that existing along the plateau at the base of the Ox Mountains, but it will reinforce a legible and compatible combination of large-scale low intensity land use in this setting. Therefore, the contribution of the Proposed Development to cumulative impacts is deemed to be **Medium** and this is not a significant level of cumulative impact.

12.5 MITIGATION MEASURES

Outside of those landscape and visual mitigation measures that formed part of the iterative design process of this Proposed Development over a number of years, and which are embedded in the assessed Project, other specific landscape and visual mitigation measures are not considered necessary / likely to be effective. Thus, the impacts assessed in **Section 12.4** are the equivalent of residual impacts in this instance.

12.5.1 Decommissioning Phase

The decommissioning phase will see a similar nature of effects to the construction stage due to the movement of heavy machinery within the Wind Farm Site and to and from the Wind Farm Site removing wind turbine components. However, such effects will be temporary in duration and decreasing in scale as wind turbines are removed from view and the landscape is substantially reinstated to former uses. As with construction stage impacts, decommissioning stage effects are not considered to be significant. It is envisaged that the hydrogen plant, grid connection and interconnector will remain in place as they are likely to have continued utility to the grid. Furthermore, removal of underground cables would likely generate greater environmental impacts than leaving them in place.

12.6 SUMMARY OF SIGNIFICANT EFFECTS

It is not considered that there will be any significant effects arising from the Project.

12.7 STATEMENT OF SIGNIFICANCE

Based on the landscape, visual and cumulative assessment contained herein, it is considered that there will not be any significant effects arising from the Project.

12.8 REFERENCES

1. Environmental Protection Agency (EPA) publication 'Guidelines on the Information to be contained in Environmental Impact Statements (2022) and the accompanying Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (2017).
2. Department of Environment Heritage and Local Government (DoEHLG) Wind Energy Planning Guidelines (2006/2019 revision) and Preferred Draft Approach to revising the 2006 Guidance published 2017.
3. Landscape Institute and the Institute of Environmental Management and Assessment publication entitled Guidelines for Landscape and Visual Impact Assessment (2013).
4. Scottish Natural Heritage (SNH) Guidance Note: 'Assessing the cumulative impact of onshore wind energy developments' (2012).
5. Scottish Natural Heritage (SNH) Siting and Designing Wind Farms in the Landscape Version 3 (2017).