Environmental Impact Assessment Report
Volume 3, Appendix 27.1: Landscape and Visual Assessment Methodology

MarramWind Offshore Wind Farm

December 2025

MarramWind

Document code:	MAR-GEN-ENV-REP-WSP-000072
Contractor document number:	852346-WEIS-IA-I6-RP-L4-102742
Version:	Final for Submission
Date:	08/12/2025
Prepared by:	WSP UK Limited / Subcontractor
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Contents

1. Introduction

1.1.1.1 The project-wide approach to the Environmental Impact Assessment (EIA) methodology is set out in **Volume 1, Chapter 5: Approach to the EIA**. This Appendix describes the proposed methodology for the landscape and visual impact assessment (LVIA), **Volume 1, Chapter 27: Landscape and Visual** for the onshore elements of the Project that may result in onshore landscape and visual effects.

1.1.1.2 This Appendix has been structured as follows:

- overview of LVIA methodology;
- iterative assessment and design;
- guidance, data sources and site surveys;
- assessing landscape effects;
- assessing visual effects;
- assessing cumulative landscape and visual effects;
- evaluation of significance;
- nature of effect;
- residential visual amenity assessment; and
- production of Zone of Theoretical Visibility's (ZTVs) and visualisations.

2. Overview of the LVIA Methodology

2.1.1.1 The assessment has been undertaken in accordance with the Landscape Institute and Institute of Environmental Management and Assessment (IEMA) (2013) *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition (GLVIA3), and other best practice guidance. An overview of the LVIA process is illustrated in **Plate 2.1**.

2.1.1.2 The LVIA has assessed the likely effects of the onshore Project infrastructure on the landscape and visual resource, encompassing effects on landscape elements, characteristics and landscape character, designated landscapes, visual effects and cumulative effects.

2.1.1.3 The landscape and visual effects (and whether they are significant) are determined by an assessment of the nature or 'sensitivity' of each receptor or group of receptors and the nature of the effect or 'magnitude of change' that would result from the Project. The evaluation of sensitivity takes account of the value and susceptibility of the receptor to the Project. This is combined with an assessment of the magnitude of change which takes account of factors such as the size and scale of the proposed change and the geographical extent. Other factors regarding the nature of the effect such as the duration of change and whether the effect is cumulative are also noted. By combining assessments of sensitivity and magnitude of change, a level of landscape or visual effect as well as the nature of that effect can be evaluated and the significance of the effect determined.

2.1.1.4 The resulting level of effect is described in terms of whether it is significant or not significant and the type of effect is described as either direct or indirect; temporary (reversible) or permanent; cumulative; and beneficial, neutral or adverse.

2.1.1.5 The time-period for the assessment covers the onshore construction period totalling up to nine years, the Project operation and maintenance (O&M) stage which is expected to be 35 years for each of the three Project phases, and decommissioning, which may take the same amount of time as construction of the Project, up to nine years, although this indicative timing may reduce.

2.2 Inter-related and cumulative assessment

2.2.1.1 The assessment also considers the whole project or combined effects of the onshore Project infrastructure comprising the landfall(s), onshore export cable corridor and the onshore substations, as well as the cumulative effects likely to result from the Project and other similar proposed developments.

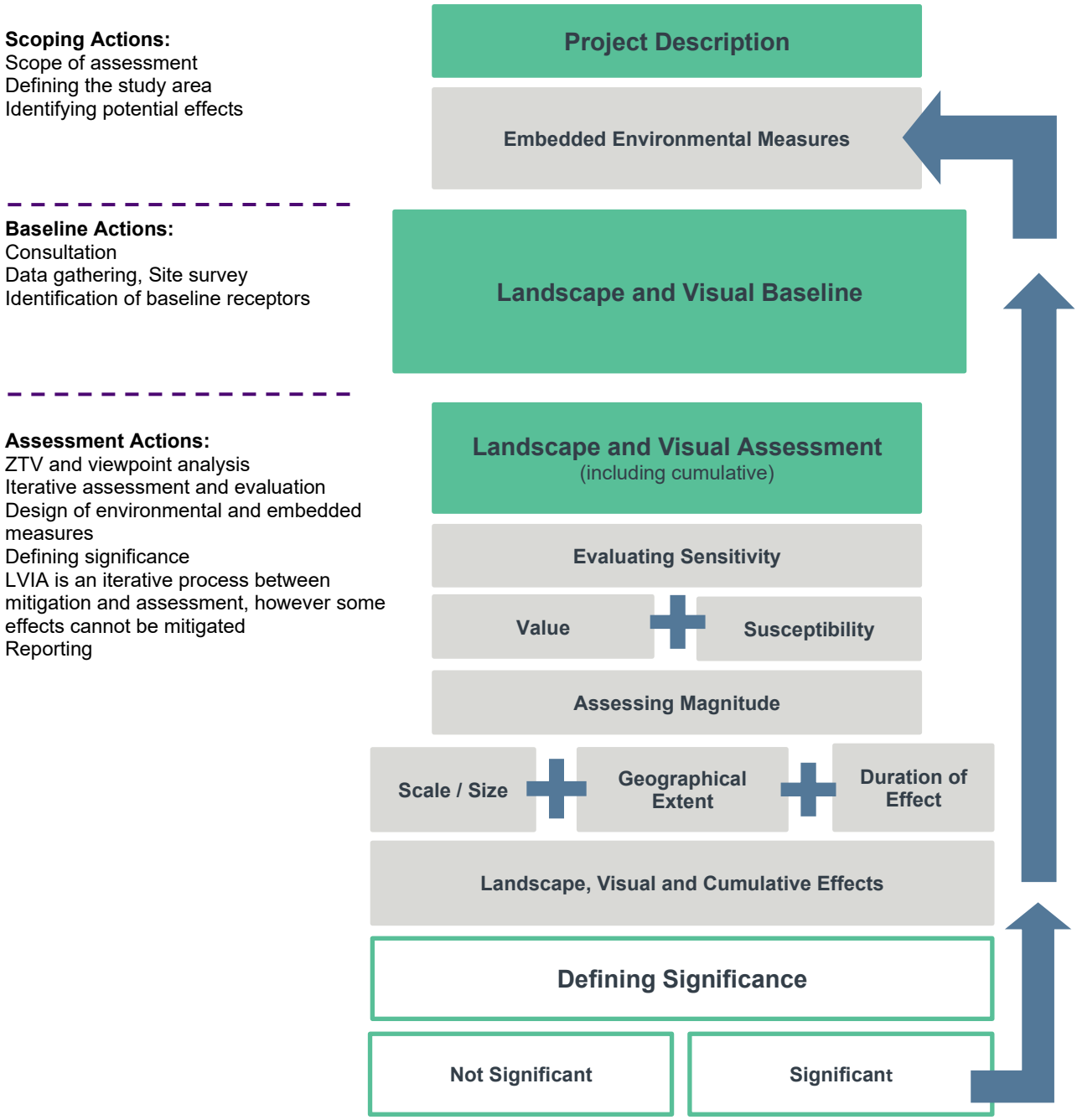
2.2.1.2 The offshore Project infrastructure has been scoped out of LVIA due to its long distance offshore.

2.3 Proportionality and review

2.3.1.1 In each case an appropriate and proportionate level of assessment has been undertaken and agreed through consultation at the scoping stage. The level of assessment may be ‘simple’ (requiring desk-based data analysis) or ‘detailed’ (requiring site surveys and investigations in addition to desk-based analysis). Due to the nature of landscape and visual assessment, all of the onshore elements of the Project have been subject to detailed assessment except for the decommissioning of the underground onshore export cables and landfall(s) which have been scoped out.

2.3.1.2 The landscape and visual assessment unavoidably involve a combination of quantitative and qualitative assessment and, wherever possible, a consensus of professional opinion has been sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach.

Plate 2.1 Overview of approach to LVIA



2.4 Defining the study area

2.4.1.1 The study area for the LVIA is illustrated in **Volume 2, Figure 27.1a: LVIA Study Areas with Red Line Boundary** and **Volume 2, Figure 27.1b: LVIA Study Areas with onshore project infrastructure** of the EIA Report and extends to 2 kilometres (km) for the landfall(s) and the onshore export cable corridor and 5km for the onshore substations. This same 'LVIA study area' has been used for the construction stage, O&M and decommissioning of the Project.

2.4.1.2 IEMA Guidance (IEMA, 2015 and 2017) recommends a proportionate assessment focused on the likely significant effects of a development, and a proportionate aspect chapter. The LVIA study area must therefore be large enough to capture all likely significant effects. However, an overly large LVIA study area may be considered disproportionate if it makes understanding the key impacts of the development more difficult by including extraneous baseline information, and hence receptors which are unlikely to be significantly affected by the Project.

2.4.1.3 This is supported by the Landscape Institute (GLVIA3) (Landscape Institute and IEMA, 2013) (paragraph 3.16) which recommends that "*The level of detail provided should be that which is reasonably required to assess the likely significant effects". Paragraph 5.2 also states that "The LVIA study area should include the site itself and the full extent of the wider landscape around it which the proposed development may influence in a significant manner*".

2.4.1.4 The assessment has been guided by detailed viewpoint analysis (**Appendix 27.2: Viewpoint Assessment**) which indicates that significant effects (during the construction stage only) would be contained well within the study area.

2.4.1.5 The LVIA study area therefore defines a limit, based on professional judgement, beyond which it is considered unlikely for significant effects to arise. This judgement of up to 2km and 5km is based on a detailed analysis of the ZTV (**Volume 2, a3 and Figure 27.b2b: Zone of Theoretical Visibility of onshore substations - construction areas**, **Figure 27.3a: Zone of Theoretical Visibility of Lunderton North Landfall, Figure 27.3b: Zone of Theoretical Visibility of Lunderton South Landfall, Figure 27.3c: Zone of Theoretical Visibility of Scotstown Landfall, Figure 27.3d: Zone of Theoretical Visibility of Onshore Cable Corridor Zone A, Figure 27.3e: Zone of Theoretical Visibility of Onshore Cable Corridor Zone B, Figure 27.3f: Zone of Theoretical Visibility of Primary Construction Compounds and Figure 27.3g: Zone of Theoretical Visibility of Secondary Construction Compounds**); site surveys to establish an understanding of the local landscape character; the scale of the construction and development proposed; detailed viewpoint analysis (**Appendix 27.2**) and knowledge of similar projects including Moray West, Moray East and Beatrice Offshore Wind Farm.

2.4.2 Assessment of the foreshore

2.4.2.1 It should be noted that the limit of the Section 36 consent / marine licence extends from the sea to the Mean High Water Springs (MHWS) and the landward limit of this Town and Country Planning Association (TCPA) application in Scotland extends to Mean Low Water Springs (MLWS) which also entails a degree of overlap along the foreshore (between the MHWS and the MLWS).

2.4.2.2 The LVIA includes consideration of those receptors within the 'foreshore', which includes beaches, inter-tidal areas and coastlines between the MLWS and the MHWS.

3. Iterative Assessment and Design

3.1 Introduction

3.1.1.1 The LVIA is part of an iterative EIA process which aims to 'design out' significant effects via a range of design and environmental measures including avoidance of effects through the site selection process and subsequent use of landscape design techniques to reduce or eliminate significant effects. Design is an integrated part of the LVIA process and environmental measures related to landscape design and management can be an important tool to mitigate significant effects as well as providing enhancement.

3.1.1.2 In addition to the EIA process, Schedule 9 of the Electricity Act (1989) includes duties to preserve the natural beauty of the countryside and take reasonable steps in order to mitigate relevant effects.

3.1.1.3 The EIA process can also call on a range of environmental and technical specialists that contribute other forms of mitigation that may also bring a range of benefits to the Project. Potentially significant landscape and visual effects and the constraints and opportunities connected with their resolution are identified through the LVIA process. Where possible, mitigation such as design modification or landscape planting schemes are incorporated into the Project to mitigate landscape and visual effects – these are termed 'embedded environmental measures'.

3.1.1.4 Embedded environmental measures relevant to the LVIA set out in Table 27.8 of **Volume 1, Chapter 27**.

3.1.2 Site selection

3.1.2.1 Site selection is a key component of the design and environmental measures process and includes the use of baseline landscape and visual data and site / field surveys in order to inform corridor and site selection through the application of relevant design guidance such as National Grid's (2009) Horlock Rules for substation site selection. The design measures have considered the potential to reduce overall landscape and visual effects as well as the use of other landscape design techniques that may be used during construction and O&M to provide mitigation.

3.2 Potential effects during construction

3.2.1.1 A range of potential effects on the landscape and visual resource are likely during the construction of the Project. These potential effects are set out in detail in Table 27.3 of **Volume 1, Chapter 27**. A summary of the potential effects likely to result from construction are described below.

- Landscape effects:
  - effects on landscape elements, features and patterns (including, but not limited to trees, woodland and hedges);
  - effects on landscape character and key characteristics, including perceptual characteristics and qualities. Construction activities are likely to include the presence of construction staff and machinery, cranes, vehicle movements, contractors' facilities and site access associated with the landfall(s), onshore substations and onshore export cable corridor. Landscape works to implement the landscape design strategy for the onshore substations and reinstatement works for the landfall(s) and along the onshore export cable corridor have been accounted for in the assessment;

- effects on the special landscape qualities (SLQs) and integrity of designated landscapes as a result of the above construction activities.

- Visual effects:
  - effects on the views and visual amenity experienced by people undertaking various activities at various locations, distances and directions from the construction sites and activities. These visual effects could be experienced from one location or sequentially as part of a route through the landscape such as a core path.

3.3 Potential effects during O&M

3.3.1.1 The potential effects during O&M relate principally to the presence of the onshore substations and the on-going maintenance and management associated with the **Volume 4: Outline Landscape and Architectural Strategy**, which forms part of the embedded environmental measures to mitigate significant landscape and visual effects.

3.3.1.2 The O&M period for each phase of the Project is expected to be up to 35 years from the completion of construction of each phase, which is likely to result in long-term (reversible) effects on landscape and visual receptors. Considering the 35-year operational stage for each phase, the effect duration has been assessed as 'permanent' although the effects of the onshore Project elements would be reversible.

3.4 Potential effects during decommissioning

3.4.1.1 The decommissioning of the onshore substations would lead in principle to a reversal of the landscape and visual effects and beneficial effects subject to the retention of the matured landscape estate. There would be no decommissioning of the underground onshore export cables and landfall(s) which would be left *in situ* and have therefore been scoped out of the LVIA.

4. Guidance Data Sources and Site Surveys

4.1 Guidance on methodology

4.1.1.1 This methodology accords with the guidance set out in the GLVIA3. Where it clarifies or diverges from specific aspects of the guidance, in a small number of areas, reasoned professional justification for this is provided as follows:

- GLVIA3 sets out an approach to the assessment of magnitude of change in which three separate considerations are combined within the magnitude of change rating. These are the size or scale of the effect, its geographical extent and its duration and reversibility. This approach is to be applied in respect of both landscape and visual receptors. It is considered that the process of combining all three considerations in one rating can distort the aim of identifying significant effects of the Project by introducing a large range of permutations. For example, a high magnitude of change, based on size or scale, may be reduced to a lower rating if it occurred in a smaller geographical area and / or for a short duration. This might mean that a potentially significant effect could be overlooked due to the limited geographical extents and / or short duration or reversibility.
- The LVIA has chosen to ensure that the description of the assessment of magnitude is therefore clearly explained and decisions regarding the weight to be given to the size or scale of the effect, its geographical extent and its duration and reversibility are fully explained separately. A conclusion is then provided on the overall level of effect by combining with judgements on sensitivity, size or scale of the effect and geographical extent to allow an assessment of the level of effect and whether an effect is significant or not significant.
- The assessment methodology utilises a six-word scale to describe the magnitude of change – high, high-medium, medium, medium-low, low and negligible-zero; which are preferred to the 'maximum of five categories' suggested in GLVIA3 (3.27), as a means of clearly defining and summarising magnitude of change judgements.
- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 states that the EIA Report should define '*the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development*'. These considerations describing the nature of the effect are reported separately in the LVIA with cumulative effects reported in **Volume 1, Chapter 33: Cumulative Effects Assessment** and further inter-related project effects, resulting from more than one EIA aspect in **Volume 1, Chapter 32: Inter-related Effects**.

4.2 Data sources

4.2.1.1 A list of the data sources used for this assessment is provided in Table 27.5 of **Volume 1, Chapter 27**.

4.3 Desk-based and site survey work

4.3.1.1 A preliminary desk-based assessment has been undertaken of landscape and visual receptors using a range of map-based data and related computer and digital analysis including ZTV, digital and / or surface terrain modelling and wireframe and street view

software. This information has been used to inform initial assessments and focus the site survey work and likely locations for viewpoint photography and sequential route assessment.

4.3.1.2 A series of site surveys have been undertaken to verify the initial desk-based assessments which may only require simple assessment techniques to complete. This may be due to receptors falling outside the ZTV or confirmation of screening from vegetation and / or built form that means there would be no view of the Project.

4.3.1.3 Site surveys (referring to the Project) and field surveys (referring to the wider LVIA study area) include the following;

- site survey verification of landscape elements within the onshore substation site and cable corridor and recommendations for embedded environmental measures where potentially significant effects are identified;
- field survey verification of the ZTV from landscape and visual receptor locations and transport and recreational routes through the LVIA study area;
- micro-siting of viewpoint locations and recording of panoramic baseline photography and subsequent visual assessment from the assessment viewpoints; and
- identification of interrelated effects between different parts of the onshore Project infrastructure.

4.3.1.4 The viewpoint photography and visual assessment surveys were undertaken between 2023 and 2025 as set out in Table 27.6 of **Volume 1, Chapter 27**.

4.3.1.5 All site survey work has been undertaken in fair weather conditions with good to excellent visibility.

5. Assessing Landscape Effects

5.1 Introduction

5.1.1.1 Landscape Effects are defined by the Landscape Institute in GLVIA3, paragraphs 5.1 and 5.2 as follows:

"An assessment of landscape effects deals with the effects of change and development on landscape as a resource. The concern here is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. ... The LVIA study area should include the site itself and the full extent of the wider landscape around it which the development may influence in a significant manner."

5.1.1.2 In accordance with GLVIA3 the term 'landscape' encompasses areas of 'townscape' and coastal areas of 'seascape'. In this assessment, the term 'landscape' is used to describe landscape and seascape unless otherwise noted.

5.2 Landscape character

5.2.1.1 GLVIA3, paragraph 5.4, advises that Landscape Character Assessment should be regarded as the main source for baseline studies and identifies the following factors which combine to create areas of distinct landscape character:

- "*the elements that make up the landscape in the LVIA study area including:*
  - *physical influences – geology, soils, landform, drainage and water bodies;*
  - *landcover, including different types of vegetation and patterns and types of tree cover; and*
  - *the influence of human activity, including land use and management, the character of settlements and buildings, and pattern and type of fields and enclosure.*
- *the aesthetic and perceptual aspects of the landscape – such as, for example, its scale, complexity, openness, tranquillity or wildness; and*
- *the overall character of the landscape in the study area, including any distinctive Landscape Character Types or Areas that can be identified, and the particular combinations of elements and aesthetic and perceptual aspects that make each distinctive, usually by identification as key characteristics of the landscape*."

5.3 Seascape character

5.3.1.1 GLVIA3 paragraph 5.6, advises that where LVIA is carried out in coastal or marine locations baseline studies must take account of seascape. Seascape is defined in the UK Marine Policy Statement, (HM Government, Northern Ireland Executive, Scottish Government and Welsh Assembly Government, March 2011) as "*landscapes with views of the* coast *or seas, and coasts and the adjacent marine environment with cultural, historical and archaeological links with each other*."

5.3.1.2 GLVIA3 paragraph 5.6, identifies the following different factors which together determine seascape character:

- "*coastal features;*

- *views to and from the sea;*
- *particular qualities of the open sea;*
- *the importance of dynamic changes due to weather and tides;*
- *changes in seascapes due to coastal processes;*
- *cultural associations; and*
- *contributions of coastal features to orientation and navigation at sea*."

5.4 Landscape designations

5.4.1.1 The assessment of landscape planning designations differs from landscape character or visual assessment in that it considers the effects of the Project on the designation and its SLQs as advised by NatureScot in their guidance (2025) *Special Landscape Qualities – Guidance on assessing effects*.

5.4.1.2 Although this guidance has been developed for Projects with the potential to impact National Scenic Areas or National Parks, it has been adopted more widely as an approach to assessing local landscape designations.

5.4.1.3 The AESLQ guidance advises a five-stage approach, which is summarised as follows:

- stage 1: review and describe the proposal;
- stage 2: identify the SLQs that may be affected by the proposal;
- stage 3: assessment of effects on SLQs and design objectives; and
- stage 4: summary of significant effects on SLQs.

5.5 Landscape effects

5.5.1.1 The potential landscape effects, occurring during the construction, O&M and decommissioning periods of the Project may therefore include, but are not restricted to the following.

- changes to landscape elements: the addition of new elements (onshore substations, and construction of the landfall(s) and onshore export cable corridor) or the removal of existing elements such as trees, vegetation and buildings and other characteristic elements or valued features of the landscape character;
- changes to landscape qualities: degradation or erosion of landscape elements and patterns and perceptual characteristics, particularly those that form key characteristic elements of the landscape character or contribute to the landscape value;
- changes to landscape character: landscape character may be affected through the incremental effect on characteristic elements, landscape patterns and qualities (including perceptual characteristics) and the addition of new features, the magnitude of which is sufficient to alter the overall landscape character within a particular area;
- changes to designated landscapes, including the Special Landscape Areas that would affect the SLQ underpinning the designation and its integrity; and
- cumulative landscape effects: where more than one development of a similar type may lead to a cumulative landscape effect.

5.5.1.2 Development may have a direct effect on the landscape as well as an indirect effect which would be perceived from the wider landscape, outside the immediate site area and its associated landscape character.

5.6 Evaluating landscape sensitivity to change

5.6.1.1 The assessment of sensitivity takes account of the landscape value and the susceptibility of the receptor to the Project.

5.6.1.2 Landscape sensitivity often varies in response to both the type and phase of the development proposed and its location, such that landscape sensitivity needs to be considered on a case-by-case basis. It should not be confused with 'inherent sensitivity' where areas of the landscape may be referred to as inherently of 'high' or 'low' sensitivity. For example, a National Park may be described as inherently of high sensitivity on account of its designation and value, although it may prove to be less sensitive or susceptible to development, and of variable sensitivity across its geographical area. Alternatively, an undesignated landscape may be of high sensitivity to a particular development regardless of the lack of local or national designation.

5.6.2 Value of the landscape receptor

5.6.2.1 The value of a landscape receptor is a reflection of the value that society attaches to that landscape. The assessment of the landscape value has been classified as high, medium, or low and the basis for this assessment has been made clear using evidence and professional judgement, based on the following range of factors:

- landscape designations - A receptor that lies within the boundary of a recognised landscape related planning designation will be of increased value, depending on the level of importance of the designation which may be international, national, regional or local. The absence of designation does not however preclude value, as an undesignated landscape receptor may be valued as a resource in the local or immediate environment;
- landscape quality - The quality of a landscape receptor is a reflection of its attributes, such as scenic quality, sense of place, rarity and representativeness and the extent to which its valued attributes have remained intact. A landscape with consistent, intact, well-defined and distinctive attributes is of higher quality and, in turn, higher value, than a landscape where the introduction of elements has detracted from its character; and
- landscape experience - The experiential qualities that can be evoked by a landscape receptor can add to its value. These responses relate to several factors including cultural associations that may exist in art, literature or history; the recreational value of the landscape, or the iconic status of the landscape in its own right; and its contribution of other values such as nature conservation or archaeology.

5.6.3 Landscape susceptibility to change

5.6.3.1 The susceptibility of a landscape receptor to change reflects its ability to accommodate the changes that would occur because of the Project without undue consequences for the maintenance of the baseline situation and / or the achievement of landscape planning policies and strategies. Some landscape receptors are better able to accommodate development than others due to certain characteristics that are indicative of capacity to accommodate change. These characteristics may or may not also be SLQ that underpin designated landscapes.

5.6.3.2 The assessment of the susceptibility of the landscape receptor to change would be classified as high, medium, or low and the basis for this assessment has been made clear using evidence and professional judgement. Indicators of landscape susceptibility to the type of development proposed (construction, O&M and decommissioning of the onshore substations, landfall(s) and onshore export cable corridor) are based on the following criteria:

- Overall Strength and Robustness - Collectively the overall characteristics and qualities of a particular landscape result in a strong and robust landscape that is capable of reasonably accommodating the Project without undue adverse effects on the SLQ (in the case of a designated landscape) or the key characteristics for which an area of landscape character or a particular element it is valued.
- Landscape Scale and Topography - The scale and topography are large enough to physically accommodate the development footprint without the requirement of invasive earthworks or drainage. Topographical features such as narrow valleys or more complex and small-scale landforms such as drumlins, incised river valleys/gorges, cliffs or rock outcrops are likely to be more susceptible to this type of development than broad, homogenous topography.
- Openness in the landscape may increase susceptibility to change because it can result in wider visibility of the Project, with enclosed landscapes able to offer a landscape framework with more screening potential, limiting visibility to a smaller area, although they may also be smaller scale and more complex which would increase susceptibility. In general, landscapes with greater enclosure are likely to be less susceptible to the Project, than more open landscapes which may be less able to accommodate the onshore substations and landscape mitigation in the form of planting schemes.
- Land Cover Pattern - Ancient and mature or long-established vegetation such as mature trees, woodland and protected hedgerows are likely to be more susceptible to the proposed development, particularly where these elements form part of a valued characteristic landscape pattern or feature. Conversely grassland / or arable crops and field boundaries comprising post and wire fencing, small, gappy hedges or young pioneer trees are likely to be less susceptible because they can be readily reinstated in the case of the cable corridor and are likely to be of lower landscape value.
- Skyline - Prominent and distinctive skylines and horizons with important landmark features that are identified in the landscape character assessment, are generally considered to be more susceptible to development such as the onshore substations in comparison to broad, simple skylines which lack landmark features or contain other infrastructure features.
- Relationship with other Development and Landmarks - Contemporary landscapes where there are existing similar developments (substations and pylons) or other forms of development (industry, mineral extraction, masts urban fringe/large settlement, major transport routes) that already have a characterising influence result in a lower susceptible to development in comparison to areas characterised by smaller scale, historic development and landmarks (historic villages with dense settlement patterns and associated buildings such as church towers).
- Rationale - Some site locations have an obvious visual rationale for the Project in terms of the available space, access, simplicity and relationship to other similar forms of development. The design quality and embedded environmental measures will be high. Conversely a site may appear overly constrained and require greater engineering or additional construction activity to accommodate the Project with lower design quality and few embedded environmental measures.

- Remoteness, Naturalness, Wildness / Tranquillity - Notably landscapes that are acknowledged to be particularly scenic, wild or tranquil are generally considered to be more susceptible to development in comparison to ordinary, cultivated or farmed / developed landscapes where perceptions of 'wildness' and tranquillity are less tangible. Landscapes which are either remote or appear natural may vary in their susceptibility to development.
- Landscape Context and Adjacent Landscapes - The extent to which the Project would influence landscape receptors across the LVIA study area relates to the associations that exist between the landscape receptor within which the Project is located and the landscape receptor from which the Project are being experienced. In some situations, this association would be strong, where the landscapes are directly related. For example, adjacent areas of landscape character may share or 'borrow' a high number of common characteristics. Landscape elements may be linked to or associated with wider landscape patterns such as individual trees forming part of an avenue or pattern of woodland, for example. In other situations, the association between adjacent landscapes would be weak. The context and visual connection to areas of adjacent landscape character or designations has a bearing on the susceptibility to development.

5.6.4 Landscape sensitivity rating

5.6.4.1 A sensitivity assessment of the landscape receptor is made by combining the assessment of the value of the landscape receptor and its susceptibility to change. The evaluation of landscape sensitivity is described as 'High', 'Medium' or 'Low' and is drawn from the consideration of a range of criteria that indicate landscape value and susceptibility. The basis for the assessment (for example whether it is an overall assessment, or specific to the location) has been made clear using evidence and professional judgement in the evaluation of sensitivity for each receptor. Criteria that tend towards higher or lower sensitivity are set out in **Table 5.1**.

Table 5.1 Landscape sensitivity to change

Criteria	Higher sensitivity	Lower sensitivity
Value of the landscape receptor		
Designation:	Designated landscape / elements with national policy level protection or defined for their natural beauty. Evidence that the landscape / element is valued or used substantially for recreational activity.	Landscapes without formal designation. Despoiled or degraded landscape with little or no evidence of being valued by the community. Elements that are uncharacteristic such as non-natives or self-seeded vegetation that may need to be cleared.
Quality:	Higher quality landscapes / elements with consistent, intact and well-defined, distinctive attributes.	Lower quality landscapes / elements with indistinct elements or features that detract from its inherent attributes.
Rarity:	Rare or unique landscape character types, features or elements.	Widespread or 'common' landscape character types, features or elements.
Aesthetic / scenic:	Aesthetic / scenic or perceptual aspects of designated wildlife, ecological or cultural	Limited wildlife, ecological or cultural heritage features, or limited contribution to landscape character.

Criteria	Higher sensitivity	Lower sensitivity
	heritage features that contribute to landscape character.	
Perceptual qualities:	Landscape with perceptual qualities of wildness, remoteness or tranquillity.	Limited or no evidence that the landscape is used for recreational activity.
Cultural associations:	Landscape with strong cultural associations that contributes to scenic quality.	Landscape with few cultural associations.
Susceptibility of the landscape receptor to change		
Strength and robustness:	Fragile landscape vulnerable and lacking the ability to accommodate change.	Robust landscape, able to accommodate change or loss of features without undue adverse effects.
Landscape scale:	A smaller scale landscape that may require further engineering to accommodate the development.	A landscape of a suitably large enough scale to accommodate the development.
Openness / enclosure:	An open landscape with limited screening or potential may be of higher susceptibility to the Project.	An enclosed landscape with screening or potential for mitigation may be of lower susceptibility to the Project.
Reinstatement:	Higher value, characteristic landcover and elements that cannot be easily reinstated or replaced.	Lower value, non-characteristic landcover and elements capable of rapid reinstatement.
Skyline:	Distinctive undeveloped skylines with landmark features.	Developed, nondistinctive skylines.
Association:	Weak and indirect association. Other development may be of a smaller scale or historic.	Strong or direct association other similar contemporary developments / landscape character.
Rationale:	Landscape with numerous environmental and technical constraints with lower design quality and / or embedded environmental measures.	Strong landscape rationale and opportunity with high degree of design quality and / or embedded environmental measures.
Perceptual Qualities:	Perceptual qualities associated with particular scenic qualities, wildness or tranquillity.	Contemporary, cultivated / settled or developed landscapes are likely to have a lower susceptibility.
Landscape Context:	Adjacent landscape character context connected by borrowed character and views.	Host landscape character is separate from surrounding / adjacent landscape character
Sensitivity to change	**High** ⟷ **Medium** ⟷ **Low**	

5.7 Landscape magnitude of change

5.7.1.1 The magnitude of change affecting landscape receptors is an expression of the scale of change that would result from the Project. In assessing the magnitude of change the assessment has focused on the size or scale of change and its geographical extent. The duration and reversibility are stated separately in relation to the assessed effects (for instance, as short / medium / long-term and temporary or permanent).

5.7.2 Size or scale of change

5.7.2.1 This criterion relates to the size or scale of change to the landscape that would arise because of the Project, based on the following factors.

- Landscape Elements: The degree to which the landscape elements or pattern of elements that makes up the landscape character would be altered by the Project, through the loss, alteration or addition of elements in the landscape. The magnitude of change would generally be higher if the features that make up the landscape character are extensively removed or altered, and / or if many new components are added to the landscape.
- Landscape Characteristics: The extent to which the effect of the Project change, (physically or perceptually) the key characteristics of the landscape which may be important to its distinctive character. This may include, for example, the scale of the landform, its relative simplicity, complexity or irregularity, the nature of the landscape context, the grain or orientation of the landscape, the degree to which the receptor is influenced by external features and the juxtaposition of the Project in relation to these key characteristics.
- Landscape Character / Designation: The degree to which landscape character receptors would be changed by the addition of the Project. If the Project is located in a landscape receptor that is already affected by other similar development, this may reduce the magnitude of change if there is a high level of integration and the developments form a unified and cohesive feature in the landscape. In the case of designated landscapes, the degree of change is considered in light of the effects on the SLQ which underpin the designation and the effect on the integrity of the designation.
- All landscapes change over time and much of that change is managed or planned. Often landscapes have management objectives for ‘protection’ or ‘accommodation’ of development. The scale of change may be localised, or occurring over parts of an area, or more widespread affecting whole landscape character areas and their overall integrity. Developmental change may be time limited or permanent.
- Distance: The size and scale of change is also strongly influenced by the proximity of the Project to the receptor and the extent to which the development can be seen as a characterising influence on the landscape. Consequently, the scale or magnitude of change is likely to be lower in respect of landscape receptors that are distant from the Project and / or screened by intervening landform, vegetation and built form to the extent that the scale of their influence on landscape receptors is small or limited. Conversely, landscapes closer to the Project are likely to be most affected. Host landscapes (where the development is located within a ‘host’ landscape character unit) would be directly affected whilst adjacent areas of landscape character would be indirectly affected.

5.7.3 Geographical extent

5.7.3.1 Landscape effects are described in terms of the geographical extent or physical area that would be affected (described as a linear or area measurement). This should not be confused

with the scale of the development or its physical footprint. The manner in which the geographical extent of the landscape effect is described for different landscape receptors is explained as follows.

- Landscape elements:
  - The geographical extent of landscape elements may be objectively measured in terms of numbers, area or linear measurement. For example, the number of trees, area of woodland / or length of hedgerow affected may be recorded.
- Landscape character / characteristics:
  - The extent of the effects on landscape character will vary depending on the specific nature of the Project. This is not simply an expression of visibility or the extent of the ZTV. It is a specific assessment of the extent of landscape character that would be changed by the Project in terms of its character, key characteristics and elements.
- Landscape designations:
  - In the case of a designated landscape, this refers to the extent the SLQ of the designation are affected and whether this can be defined in terms of area or linear measurements, or subjectively (with the support of panel and / or peer review) and whether the integrity of the designation is affected.

5.7.4 Duration and reversibility

5.7.4.1 The duration and reversibility of landscape effects would be based on the period over which the Project is likely to exist (during construction and O&M) and the extent to which it would be removed (during decommissioning) and the effects reversed at the end of that period. These elements are included within the assessment as descriptors for the type of effect, however they are not considered within the magnitude of change. Due to the phasing of construction activities proposed for the Project, duration and reversibility is precautionary in nature.

5.7.4.2 Long-term, medium-term and short-term landscape effects are defined as follows:

- long-term – more than ten years (essentially assessed as though ‘permanent’ although the effects of the onshore substation would be reversible);
- medium-term – six to ten years; and
- short-term – one to five years.

5.7.4.3 Reversibility is a separate, but linked consideration concerning the prospects and practicality of a particular effect being reversed. Some forms of development, such as housing can be considered as permanent, whereas other forms of development such as wind farms can be considered as reversible because they have a limited operational life and after their removal the land would be restored. Mineral workings for example may be partially reversible with the landscape restored, although not completed to the same appearance as the original.

5.7.5 Landscape magnitude of change rating

5.7.5.1 The ‘magnitude’ or ‘degree of change’ resulting from the Project is described as ‘High’, ‘High-medium’, ‘Medium’, ‘Medium-low’ ‘Low’ or ‘Negligible-Zero’. In assessing the magnitude of change the assessment has focused on the size or scale of change and its geographical extent. The duration and reversibility are stated separately in relation to the assessed effects (for instance, as short / medium / long-term and temporary or permanent).

The basis for the assessment of magnitude for each receptor has been made clear using evidence and professional judgement.

5.7.5.2 The levels of magnitude of change that can occur are defined in **Table 5.2.**

Table 5.2 Landscape magnitude of change ratings

Magnitude of landscape change	Examples of landscape magnitude
High	• size / scale: a large-scale change and major loss of key landscape elements / characteristics or the addition of large scale or numerous new and uncharacteristic features or elements that would affect the landscape character and the SLQ / integrity of a landscape designation. Directly affecting a host landscape receptor or indirectly affecting a nearby receptor. • geographical extent: the size or scale of change would typically but not always affect a large geographical extent or area and may be close to the Project.
High-medium	Intermediate rating with combination of criteria from high or medium magnitude.
Medium	• size / scale: a medium scale change and moderate loss of some key landscape elements / characteristics or the addition of some new medium scale uncharacteristic features or elements that could partially affect the landscape character and the SLQ of a landscape designation. Directly affecting a host landscape receptor or indirectly affecting a nearby receptor. • geographical extent: the size or scale of landscape change would typically but not always affect a more localised geographical extent at an intermediate distance from the Project.
Medium-low	Intermediate rating with combination of criteria from medium or low magnitude.
Low	• size / scale: a small-scale change and minor loss of a few landscape elements / non key characteristics, or the addition of some new small-scale features or elements of limited characterising influence on landscape character / designations; and • geographical extent: there may be a small partial change in landscape character, typically, but not always affecting a localised geographical extent at some distance from the Project.
Negligible - Zero	• size / scale: a very small-scale change that may include the loss or addition of some landscape elements of limited characterising influence. The landscape characteristics and character would be unaffected; and • geographical extent: typically affecting a very small geographical extent at greater distance from the Project.

5.8 Evaluating landscape effects and significance

5.8.1.1 The level of landscape effect is evaluated through the combination of landscape sensitivity and magnitude of change. Once the level of effect has been assessed, a judgement is then made as to whether the level of effect is 'significant' or 'not significant' as required by the relevant EIA Regulations. This process is assisted by the matrix in **Table 8.1** which is used to guide the assessment.

5.8.1.2 Further information is also provided about the nature of the effects (whether these would be direct / indirect; temporary / reversible / permanent; beneficial / neutral / adverse or cumulative).

5.8.2 Significant landscape effects

5.8.2.1 A significant effect would occur where the combination of the variables results in the Project having a defining effect on the landscape receptor, or where changes of a lower magnitude affect a landscape receptor that is of particularly high sensitivity. A major loss or irreversible effect over an extensive area or landscape character, affecting landscape elements, characteristics and / or perceptual aspects that are key to a nationally valued landscape are likely to be significant.

5.8.3 Non-significant landscape effects

5.8.3.1 A non-significant effect would occur where the effect of the Project on the landscape receptor is not defining, and the landscape character of the receptor continues to be characterised principally by its baseline characteristics. Equally a small-scale change experienced by a receptor of high sensitivity may not significantly affect the special landscape quality of a designation. Reversible effects, on elements, characteristics and character that are of small-scale or affecting lower value receptors are unlikely to be significant.

6. Assessing Visual Effects

6.1.1.1 Visual effects are concerned wholly with the effect of the development on views, and the general visual amenity and are defined by the Landscape Institute in GLVIA3, paragraphs 6.1 as follows:

"An assessment of visual effects deals with the effects of change and development on views available to people and their visual amenity. The concern ... is with assessing how the surroundings of individuals or groups of people may be specifically affected by changes in the context and character of views."

6.1.1.2 Visual effects are identified for different receptors (people) who would experience the view at their place of residence, within their community, during recreational activities, at work, or when travelling through the area. The visual effects may include the following:

- visual effect: a change to an existing static view, sequential views, or wider visual amenity as a result of development or the loss of particular landscape elements or features already present in the view; and
- cumulative visual effects: the cumulative or incremental visibility of similar types of development may combine to have a cumulative visual effect.

6.1.1.3 The level of visual effect (and whether this is significant) is determined through consideration of the sensitivity of each visual receptor (or range of sensitivities for receptor groups) and the magnitude of change that would be brought about by the construction, O&M and decommissioning of the Project.

6.2 ZTV

6.2.1.1 Plans mapping the ZTV are used to analyse the extent of theoretical visibility of development or part of a development, across the LVIA study area and to assist with viewpoint selection. The ZTV does not however, take account of the screening effects of buildings, localised landform and vegetation, unless specifically noted (see individual figures). As a result, there may be roads, tracks and footpaths within the LVIA study area which, although shown as falling within the ZTV, are screened or filtered by built form and vegetation, which would otherwise preclude visibility.

6.2.1.2 The ZTVs provide a starting point in the assessment process and accordingly tend towards giving a 'worst case' or greatest calculation of the theoretical visibility.

6.3 Viewpoint analysis

6.3.1.1 Viewpoint analysis is used to assist the assessment and is conducted from selected viewpoints within the LVIA study area. The purpose of this is to assess both the level of visual effect for particular receptors and to help guide the design process and focus the assessment. A range of viewpoints are examined in detail and analysed to determine whether a significant visual effect would occur. By considering the viewpoints in order of distance it is possible to define a threshold or outer geographical limit, beyond which it would be reasonable to assume that significant effects would be unlikely.

6.3.1.2 The assessment involves visiting the viewpoint location and viewing wirelines and photomontages prepared for each viewpoint location. The fieldwork is conducted in periods of fine weather with good visibility.

6.3.1.3 In terms of seasonal variability related to leaf cover or hedgerow maintenance, the LVIA has assumed a 'worst case' of winter views when there would be low, or no leaf cover and hedgerows have been cut (where there is evidence that these are maintained).

6.3.1.4 The viewpoint analysis is reported in **Appendix 27.2**. A summary table of the findings has also been provided in order of distance from the Project. This summary table has been used to assist in defining the direction, elevation, geographical spread and nature of the potential visual effects and identify areas where significant effects are likely to occur. This approach seeks to provide clarity and confidence to consultees and decision makers by allowing the detailed judgements on the magnitude of visual change to be more readily scrutinised and understood.

6.4 Evaluating visual sensitivity to change

6.4.1.1 In accordance with paragraphs 6.31-6.37 of GLVIA3, the sensitivity of visual receptors has been determined by a combination of the value of the view and the susceptibility of the visual receptors to the change likely to result from the Project on the view and visual amenity.

6.4.2 Value of the view

6.4.2.1 The value of a view or series of views reflects the recognition and importance attached either formally through identification on mapping or being subject to planning designations, or informally through the value which society attaches to the view(s). The value of a view has been classified as high, medium or low and the basis for this assessment has been made clear using evidence and professional judgement, based on the following criteria.

- Formal recognition - The value of views can be formally recognised through their identification on Ordnance Survey (OS) or tourist maps as formal viewpoints, sign-posted and with facilities provided to add to the enjoyment of the viewpoint such as parking, seating and interpretation boards. Specific views may be afforded protection in local planning policy and recognised as valued views. Specific views can also be cited as being of importance in relation to landscape or heritage planning designations, for example the value of a view would be increased if it presents an important vista from a designed landscape or lies within or overlooks a designated area, which implies a greater value to the visible landscape.
- Informal recognition - Views that are well-known at a local level and / or have particular scenic qualities can have an increased value, even if there is no formal recognition or designation. Views or viewpoints are sometimes informally recognised through references in art or literature, and this can also add to their value. A viewpoint that is visited and appreciated by many people would generally have greater importance than one gained by very few people.

6.4.3 Susceptibility to change

6.4.3.1 Susceptibility relates to the nature of the viewer experiencing the view and how susceptible they are to the potential effects of the Project. A judgement to determine the level of susceptibility therefore relates to the nature of the viewer and their experience from that particular viewpoint or series of viewpoints, classified as high, medium or low and based on the following criteria.

- Nature of the viewer - The nature of the viewer is defined by the occupation or activity of the viewer at the viewpoint or series of viewpoints. The most common groups of viewers considered in the visual assessment include residents, motorists, and people

taking part in recreational activity or working. Viewers, whose attention is focused on the landscape, or with static long-term views, are likely to have a higher sensitivity. Viewers travelling in cars or on trains would tend to have a lower sensitivity as their view is transient and moving. The least sensitive viewers are usually people at their place of work as they are generally less sensitive to changes in views.

- Experience of the viewer - The experience of the visual receptor relates to the extent to which the viewer's attention or interest may be focused on the view and the visual amenity they experience at a particular location. The susceptibility of the viewer to change arising from the Project may be influenced by the viewer's attention or interest in the view, which may be focused in a particular direction, from a static or transitory position, over a long or short duration. For example, if the principal outlook from a settlement is aligned directly towards the Project, the experience of the visual receptor would be altered more notably than if the experience relates to a glimpsed view seen at an oblique angle from a car travelling at high speed. The visual amenity experienced by the viewer varies depending on the presence and relationship of visible elements, features or patterns experienced in the view and the degree to which the landscape in the view may accommodate the Project.

6.4.4 Visual sensitivity rating

6.4.4.1 An overall level of sensitivity has been applied for each visual receptor or view – High, Medium or Low – by combining individual assessments of the value of the view and the susceptibility of the visual receptor to change. Each visual receptor, meaning the particular person or group of people likely to be affected at a specific viewpoint, is assessed in terms of their sensitivity. The basis for the assessments has been made clear using evidence and professional judgement in the evaluation of each receptor. Criteria that tend towards higher or lower sensitivity are set out in **Table 6.1**Table 6.1.

Table 6.1 Visual sensitivity to change

Criteria	Higher	Lower
Value of the visual receptor		
Maps / Tourist information	Specific viewpoint identified in OS maps and / or tourist information and signage.	Viewpoint not identified in OS maps or tourist information and signage.
Facilities	Facilities provided at viewpoint to aid the enjoyment of the view.	No facilities provided at viewpoint to aid enjoyment of the view.
Planning recognition	View afforded protection in planning policy.	View is not afforded protection in planning policy.
Landscape value	View is within or overlooks a designated landscape, which implies a higher value to the visible landscape.	View is not within, nor does it overlook, a designated landscape.
Informal recognition	View has informal recognition and well- known at a local level, as having particular scenic qualities.	View has no informal recognition and is not known as having particular scenic qualities.

Criteria	Higher	Lower
Art / Literature	View or viewpoint is recognised through references in art or literature.	View or viewpoint is not recognised in references in art or literature.
Scenic quality	View has high scenic qualities relating to the content and composition of the visible landscape.	View has low scenic qualities relating to the content and composition of the visible landscape.
Susceptibility of the visual receptor to change		
Activity of the viewer	Viewers such as walkers, or tourists, whose main attention and interest are on their surroundings.	Viewers whose main attention is not focused on their surroundings, such as people at work, or specific forms of recreation.
Nature of the view	Residents that gain static, long-term views of the Project in their principal outlook.	Viewers who are transient and dynamic, such as those travelling in cars or on trains, where the view is of short duration.
Numbers of viewers	Viewpoint is visited or used by a large number of people / popularity of the location, although care needs to be taken in respect of areas valued for their remoteness.	View is visited or gained by very few people.
Direction / field of view (FoV)	A view that is focused in a specific directional vista, with notable features of interest in a particular part of the view.	Open views with no specific point of interest.
Visual amenity	Viewers are focused on the experience of a high level of visual amenity at the location due to its overall pleasantness as an attractive visual setting or backdrop to activities.	The visual amenity experienced at the location by viewers is less pleasant or attractive than might otherwise be the case.
Sensitivity to change	**High** ⟷ **Medium** ⟷ **Low**	

6.5 Visual magnitude of change

6.5.1.1 The visual magnitude of change is an expression of the scale of change that would result from the visibility of the Project. In assessing the magnitude of change the assessment is focused on the size or scale of change and its geographical extent. The duration and reversibility are stated separately in relation to the assessed effects (for instance, as short / medium / long-term and temporary / permanent).

6.5.2 Size or scale of change

6.5.2.1 An assessment has been made of the size or scale of change in the view that is likely to be experienced because of the Project, based on the following criteria.

- Distance - The distance between the visual receptor / viewpoint and the Project. Generally, the greater the distance, the lower the magnitude of change as the Project would constitute a smaller-scale component of the view.
- Size - The amount and size of the Project that would be seen. Visibility may range from small or partial to whole visibility of the Project. Generally, the larger and greater number of elements (for example, wind turbines and access tracks) of the Project that appear in the view, the higher the magnitude of change. This is also related to the degree to which development may be wholly or partly screened by landform, vegetation (seasonal) and / or built form. Conversely open views are likely to reveal more of a development, particularly where this is a key characteristic of the landscape.
- Scale - The scale of the change in the view, with respect to the loss or addition of features in the view and changes in its composition. The scale of the Project may appear larger or smaller relative to the scale of the receiving landscape.
- FoV - The vertical / horizontal FoV and the proportion of view that is affected by the Project. Generally, the more of the proportion of a view that is affected, the higher the magnitude of change would be. If the Project extends across the whole of the view, the magnitude of change would generally be higher as the full view would be affected. Conversely, if the Project extends over a narrow part of an open view, the magnitude of change is likely to be reduced as the Project would not affect the whole view or outlook. This can in part be described objectively by reference to the horizontal / vertical FoV affected, relative to the extent and proportion of the available view.
- Contrast - The character and context within which the Project would be seen and the degree of contrast or integration of any new features with existing landscape elements, in terms of scale, form, mass, line, height, colour, luminance and motion. Developments which contrast or appear incongruous in terms of colour, scale and form are likely to be more visible and have a higher magnitude of change.
- Consistency of image - The consistency of image of the Project in relation to other developments. The magnitude of change for the Project is likely to be lower if it appears broadly similar to other developments in the landscape in terms of its scale, form and general appearance. New development is more likely to appear as logical components of the landscape with a strong rationale for their location.
- Skyline / Background - Whether the Project would be viewed against the skyline or a background landscape may affect the level of contrast and magnitude. For example, skyline developments may appear more noticeable, particularly where they affect open and undeveloped horizons. Conversely, development may also appear more noticeable when viewed against a darker background landscape, such as forestry. In these cases, the magnitude of change would tend to be higher. If the Project adds to an already developed skyline the magnitude of change would generally tend to be lower.
- Number - Generally, the greater the number of separate development components seen simultaneously or sequentially, the higher the magnitude of change and this may lead to whole project effects (for example the visual effect of the turbines and the substation). Further cumulative effects would occur in the case of separate, existing developments and their spatial relationship to each other would affect the magnitude of change. For example, development that appears as an extension to an existing development would tend to result in a lower magnitude of change than a separate, new development.
- Nature of Visibility - The nature of visibility is a further factor for consideration. For example, the manner in which the development is viewed could be intermittent or continuous and / or seasonal, due to periodic management or leaf fall.

6.5.2.2 In terms of seasonal variability related to leaf cover or hedgerow maintenance, the LVIA has assumed a 'worst case' of winter views when there would be low or no leaf cover and hedgerows have been cut (where there is evidence that these are maintained).

6.5.3 Geographical extent

6.5.3.1 The geographic extent over which the visual effects would be experienced is also be assessed. This is distinct from the size or scale of effect and is described in terms of the physical area or location over which it would be experienced (described as a linear or area measurement). The extent of the effects would vary according to the specific nature of the Project and is principally assessed through ZTV, field survey and viewpoint analysis not of the extent of visibility likely to be experienced by visual receptors. The geographical extent of visual effects is described as per the following examples:

- The geographical extent can be described as an area measurement or proportion of the total receptor affected. For example, effects on people within a particular area such as a golf course or area of common land can be illustrated via a 'representative viewpoint' that represents a similar visual effect, likely to be experienced by larger numbers of people within that area. The geographical extent of that visual effect can be expressed as approximately '5 hectares' or '10 per cent' of the common land or a golf course area.
- The geographical extent can be described as a linear measurement (m or km) according to the length of route affected. For example, effects on people travelling on a route through the landscape such as a road or footpath can be illustrated via a 'representative viewpoint' that represents a similar visual effect, likely to be experienced by larger numbers of people along that route. The geographical extent of that visual effect can be expressed as approximately '2km' or '10 per cent' of the total length of the route or affected travel time.
- The geographical extent of a visual effect experienced from a specific viewpoint may be limited to that location alone. (An example of a 'specific viewpoint' is a public viewpoint recommended in tourist literature such as a well visited hill summit. An example of an 'illustrative viewpoint' is a particular location within a built up or well vegetated area where an uncharacteristically open view exists).

6.5.4 Duration and reversibility

6.5.4.1 The duration or time over which a visual effect is likely to occur is judged on a scale of 'short', 'medium' or 'long' term and is assessed for the Project as per the method described previously in **Section 5.7.4**.

6.5.4.2 Reversibility is a separate, but linked consideration, also assessed for the Project as per the method described in previously in **Section 5.7.4**.

6.5.5 Visual magnitude of change rating

6.5.5.1 The 'magnitude' or 'degree of change' resulting from the Project is described as 'High', 'High-medium', 'Medium', 'Medium-low' 'Low' and 'Negligible-Zero'. In assessing the magnitude of change the assessment has focused on the size or scale of change and its geographical extent. The duration and reversibility are stated separately in relation to the assessed effects (for instance, as short / medium / long-term and temporary / permanent). The basis for the assessment of magnitude for each receptor is made clear using evidence and professional judgement and some examples of the levels of magnitude of change that can occur on views are defined in **Table 6.2**.

Table 6.2 Visual magnitude of change

Magnitude of landscape change	Examples of visual magnitude
High	• Size and scale: A very large - large and dominant change to the view. • Number: Involving the loss / addition of a large number of features / elements. • Distance: Typically appearing closer to the viewer in the foreground. • FoV: Affecting a large vertical and wide horizontal FoV. • Visibility: Multiple phase development with continuous / sequential visibility. • Contrast: Strong contrast with surroundings with little or no screening. • Skyline: Visible on the skyline as a new feature. • Consistency of image: Contrasting with other developments, lacking in visual rationale. Typically experienced from representative viewpoints illustrating a visual effect likely to be experienced by larger numbers of people, relative to the activity, affecting a large area or length / proportion of route. May also be experienced from a specific viewpoint.
High-medium	Intermediate rating with combination of criteria from high or medium magnitude of change category.
Medium	• Size and scale: A medium and prominent change to the view. • Number: Involving the loss / addition of a number of features / elements. • Distance: Typically appearing in the middle ground. • FoV: Affecting a medium vertical and a medium horizontal FoV. • Visibility: Multiple phase development with intermittent / sequential visibility. • Contrast: Contrast with surroundings and may benefit from some screening. • Skyline: Visible on the skyline along with other features. • Consistency of image: Different from other developments, some visual rationale. Typically experienced from representative viewpoints illustrating a visual effect likely to be experienced by a medium number of people, relative to the activity, affecting a medium area or length / proportion of route. May also be experienced from a specific viewpoint.
Medium-low	Intermediate rating with combination of criteria from medium or low magnitude of change category.
Low	• Size and scale: A small / noticeable change, could be missed by casual observer. • Number: Involving loss / addition of a small number of features / elements. • Distance: Typically appearing in the background. • FoV: Affecting a small vertical and a narrow horizontal FoV. • Visibility: Simple, single development, intermittently and infrequently visible. • Contrast: Some parity, 'fits' with surroundings and benefits from screening.

Magnitude of landscape change	Examples of visual magnitude
	• Skyline: Partly visible on a developed skyline or not visible on the skyline. • Consistency of image: Similar to other developments with visual rationale, appearing reasonably well accommodated within its surroundings. Typically experienced from illustrative viewpoints likely to be experienced by low numbers of people, relative to the activity, affecting a smaller area or length / proportion of route. May also be experienced from a specific viewpoint.
Negligible - Zero	• Size and scale: A small or negligible change, need to 'look for it'. • Number: Involving the loss / addition of a small number of features / elements. • Distance: Typically appearing in the far distance. • FoV: Affecting a small vertical and a very narrow horizontal FoV. • Visibility: Simple, single development, intermittently and infrequently visible. • Contrast: Blends with surroundings and / or is well screened. • Skyline: Partly visible on a developed skyline or not visible on the skyline. • Consistency of image: Similar to other developments with visual rationale, appearing reasonably well accommodated within its surroundings. Typically experienced from illustrative viewpoints likely to be experienced by low numbers of people, relative to the activity, affecting a smaller area or length / proportion of route. May also be experienced from a specific viewpoint.

6.6 Evaluating visual effects and significance

6.6.1 Introduction

6.6.1.1 The level of visual effect is evaluated through the combination of visual sensitivity and magnitude of change. Once the level of effect has been assessed, a judgement is then made as to whether the level of effect is 'significant' or 'not significant' as required by the relevant EIA Regulations. This process is assisted by the matrix in **Table 8.1** which is used to guide the assessment. The factors considered in the evaluation of the sensitivity and the magnitude of the change resulting from the Project and their conclusion, has been presented in a comprehensive, clear and transparent manner.

6.6.1.2 Further information is also provided about the nature of the effects (whether these would be direct / indirect; temporary / reversible / permanent; beneficial / neutral / adverse or cumulative).

6.6.2 Significant visual effects

6.6.2.1 A significant effect is more likely to occur where a combination of the variables results in the Project having a defining effect on the view or visual amenity or where changes affect a visual receptor that is of high sensitivity.

6.6.3 Non-significant visual effects

6.6.3.1 A non-significant effect is more likely to occur where a combination of the variables results in the Project having a non-defining effect on the view or visual amenity or where changes affect a visual receptor that is of low sensitivity.

6.6.4 Weather conditions

6.6.4.1 The assessment of visual effects is undertaken in clear weather with good to excellent visibility. This means that the viewpoint assessment represents a maximum or fair assessment of the likely visual effects.

7. Assessing cumulative landscape and visual effects

7.1.1.1 NatureScot's guidance, *Assessing the Cumulative Impact of Onshore Wind Energy Developments* (2021) is widely used across the UK to inform the specific assessment of the cumulative effects of both onshore and offshore windfarms and can be adapted to other forms of development such as grid infrastructure. GLVIA3 provides more general guidance on cumulative assessment. The NatureScot (2021) guidance defines:

- "*Cumulative effects as the additional changes caused by a Proposed Development in conjunction with other similar developments or as the combined effect of a set of developments taken together* (SNH, 2012: p4);
- *Cumulative landscape effects are those effects that 'can impact on either the physical fabric or character of the landscape, or any special values attached to it'* (SNH, 2012, p10); and
- *Cumulative visual effects are those effects that can be caused by combined visibility, which occurs where the observer is able to see two or more developments from one viewpoint and / or sequential effects which occur when the observer has to move to another viewpoint to see different developments*" (SNH, 2012, p11).

7.1.1.2 The potential cumulative effects of the Project with other relevant existing, consented or proposed development are described as follows.

- The cumulative effects of the Project in *addition* to and in *combination* with other similar development (wind farms and other relevant development such as grid related projects) that are either consented / under construction; the subject of a valid planning application; or proposed as part of relevant plans and programmes.

7.1.1.3 This assessment distinguishes between 'additional' cumulative effects that would result from the addition of the Project to other cumulative development and 'combined' cumulative effects that assess the total cumulative effect of the Project and other development. In the latter case a significant cumulative effect may result from the Project or one of more other existing, under-construction or consented developments, or other applications. In those cases, the main contributing development(s) is identified in the assessment. The assessment of cumulative effects is essentially the same as for the main assessment of the standalone or primary landscape and visual effects, in that the level of landscape and visual effect is determined by assessing the sensitivity of the landscape or visual receptor and the magnitude of change. Cumulative assessment, however, considers the magnitude of change posed by multiple developments of a similar nature.

7.1.1.4 A cumulative landscape or visual effect simply means that more than one type of development is present or visible within the landscape. Other forms of existing development and land-use such as woodland and forestry, patterns of agriculture, built form, and settlements already have a cumulative effect on the existing landscape that is already accepted or taken for granted. These features often contribute strongly to the existing character, forming a positive or adverse component of the local landscape. Landscapes, however, have a finite capacity for cumulative development, beyond which further new development would result in landscape character change and could result in the creation of a 'wind farm landscape' where wind farms have become the dominant characteristic.

7.1.1.5 Types of cumulative effect are defined as follows:

- cumulative landscape effects: where more than one development may have an effect on a landscape designation or area of landscape character;
- cumulative visual effects: the cumulative or incremental visibility of similar types of development that may combine to have a cumulative visual effect. These can be further defined as follows:
  - simultaneous or combined: where two or more developments may be viewed from a single fixed viewpoint simultaneously, within the viewer's FoV and without requiring them to turn their head;
  - successive or repetitive: where two or more developments may be viewed from a single viewpoint successively as the viewer turns their head or swivels through 360°; and
  - sequential: where several developments may be viewed sequentially or repeatedly at increased frequency, from a range of locations when travelling along a route within the LVIA study area.

7.1.1.6 Whilst the Cumulative Landscape and Visual Impact Assessment (CLVIA) considers other development, it should not be considered as a substitute for individual LVIA assessment in respect of each of the other cumulative developments included in the CLVIA.

8. Evaluation of significance

8.1.1.1 The matrix presented in **Table 8.1** is used as a guide to illustrate the LVIA process. In line with the emphasis placed in GLVIA3 upon the application of professional judgement, an overly mechanistic reliance upon a matrix is avoided through the provision of clear and accessible narrative explanations of the rationale underlying the assessment made for each landscape and visual receptor. Such narrative assessments provide a level of detail over and above the outline assessment provided by use of the matrix alone.

8.1.1.2 The landscape and visual assessment unavoidably, involves a combination of quantitative and qualitative assessment and wherever possible cross references has been made to objective evidence, baseline figures and / or to photomontage visualisations to support the assessment conclusions. Often a consensus of professional opinion has been sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach. Importantly each effect results from its own unique set of circumstances and have been assessed on a case-by-case basis. The matrix as presented in **Table 8.1** should therefore be considered as a guide and any deviation from this guide has been clearly explained in the assessment.

8.1.1.3 Significant landscape and visual effects are highlighted in bold with dark shading in **Table 8.1**. They relate to all those effects that result in a '**Major**' or a '**Major / Moderate**' level of effect. In some circumstances, '**Moderate**' levels of effect (lighter shading) also have the potential, subject to the Applicant's opinion, to be considered as significant and these exceptions are also highlighted in bold in the text and has been explained as part of the assessment, where they occur. White or un-shaded boxes in **Table 8.1** indicate a non-significant effect.

8.1.1.4 In those instances where there would be no effect, the magnitude has been recorded as 'Zero' and the level of effect as 'None', 'No View', or 'No Effect'.

Table 8.1 Evaluation of landscape and visual effects

Sensitivity	**Magnitude of change**					
	High	**High-medium**	**Medium**	**Medium-low**	**Low**	**Negligible-zero**
High	**Major** (Significant)	**Major** (Significant)	**Major / Moderate** (Significant)	**Moderate***	**Moderate***	Minor
High - medium-	**Major** (Significant)	**Major / Moderate** (Significant)	**Moderate***	**Moderate***	Moderate / Minor	Minor
Medium	**Major / Moderate** (Significant)	**Moderate***	**Moderate***	Moderate / Minor	Minor	Minor / **Negligible**
Medium-low	**Moderate***	**Moderate***	Moderate / Minor	Minor	Minor / **Negligible**	**Negligible**
Low	**Moderate***	Moderate / Minor	Minor	Minor / **Negligible**	**Negligible**	**Negligible**
*Note: Moderate levels of effect may / may not be significant subject to the Applicant's opinion which shall be clearly explained.						

9. Nature of Effects

9.1.1.1 The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 state that the EIA Report should define '*the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development*'.

9.1.1.2 Cumulative effects have been described in **Section 7**, and '*short-term, medium-term and long-term, permanent and temporary'* are described in **Section 5** and **Section 6** under the heading 'Duration of Effect'.

9.1.1.3 The definition of the remaining terms used in this assessment is defined here.

9.2 Direct and indirect effects

9.2.1.1 The GLVIA, glossary notes that landscape may be directly and indirectly affected by development and defines indirect effects as "*Effects that result indirectly from the proposed project as a consequence of the direct effects, often occurring away from the site, or as a result of a sequence of interrelationships or a complex pathway. They may be separated by distance or in time from the source of the effects*".

9.2.1.2 Direct landscape effects relate to the host landscape and concern both physical and perceptual effects on the receptor.

9.2.1.3 Indirect landscape effects may also affect the host landscape as well as other landscapes, often separated by distance from the Project, because of views that affect the perceptual aspects of their character and key characteristics.

9.2.1.4 Visual effects are generally all considered as direct effects. An indirect visual effect may however be used to define a visual effect on a view that is not in the direction of the main view of the viewer as described by the following examples:

- road users generally face the road directly ahead in the direction of travel and visual effects affecting those views may be described as direct effects. Where the visual effect is experienced in views oblique to the direction of travel they may be described as indirect; and
- designed landscapes and vistas / viewpoints may be orientated in a particular direction and visual effects affecting those views may be described as direct effects. Where the visual effect is experienced in views oblique to the direction of the designed or main / primary view they may be described as indirect.

9.2.1.5 Secondary effects (or effects subsequent to an initial effect) are covered in this assessment by indirect effects.

9.3 Positive and negative effects

9.3.1.1 Guidance provided by the in GLVIA3 on the nature of effect (for instance, beneficial or adverse) states that '*in the LVIA, thought must be given to whether the likely significant landscape and visual effects are judged to be positive (beneficial) or negative (adverse) in their consequences for landscape or for views and visual amenity'*, but it does not provide guidance as to how that may be established in practice. The nature of effect is therefore one that requires interpretation and, where applied, this involves reasoned professional opinion.

9.3.1.2 In this assessment the nature of effects refers to whether the landscape and / or visual effect of the Project is positive or negative (herein referred to as 'beneficial', 'neutral' or 'adverse').

9.3.1.3 In relation to many forms of development, the LVIA has identified 'beneficial' and 'adverse' effects by assessing these under the term 'Nature of Effect'. The landscape and visual effects of large-scale infrastructure are difficult to categorise in either of these brackets as, unlike other disciplines, there are no definitive criteria by which the effects can be measured as being categorically 'beneficial' or 'adverse'. In some disciplines, such as noise or ecology, it is possible to quantify the effect in numeric terms, by objectively identifying or quantifying the proportion of a receptor that is affected and assessing the nature of that effect in justifiable terms. However, this is not the case in relation to landscape and visual effects where the approach combines quantitative and qualitative assessment.

9.3.1.4 Generally, in the development of 'new' energy infrastructure, a precautionary approach is adopted, which assumes that significant landscape and visual effects have been weighed on the adverse side of the planning balance. Unless it is stated otherwise, the effects considered in the assessment have been considered adverse. Beneficial or neutral effects may, however, arise in certain situations and are stated in the assessment where relevant, based on the following definitions.

- Beneficial effects contribute to the landscape and visual resource through the enhancement of desirable characteristics or the introduction of new, beneficial attributes. The development contributes to the landscape by virtue of good design or the introduction of new landscape planting or considered architectural design that avoids adverse effects and encourages the development to be seen in architectural terms. The removal of undesirable existing elements or characteristics can also be beneficial, as can their replacement with more appropriate components.
- Neutral effects occur where the development fits with the existing landscape character or visual amenity. The development neither contributes to or detracts from the landscape and visual resource and can be accommodated with neither beneficial or adverse effects, or where the effects are so limited that the change is hardly noticeable. A change to the landscape and visual resource is not considered to be adverse simply because it constitutes an alteration to the existing situation.
- Adverse effects are those that detract from the landscape character or quality of visual attributes experienced, through the introduction of elements that contrast, in a detrimental way, with the existing characteristics of the landscape and visual resource, or through the removal of elements that are key in its characterisation.

10. Residential Visual Amenity Assessment (RVAA)

10.1.1.1 The assessment of residential amenity is a planning matter that involves consideration of several effects (such as noise and shadow flicker), of which residential visual amenity is a single component. The RVAA is limited to the consideration of visual effects on the residential amenity of residential properties. Visual amenity is defined in the GLVIA3 as:

10.1.1.2 "… *the overall pleasantness of the views they enjoy of their surroundings' and 'Residential Visual Amenity means: the overall quality, experience and nature of views and outlook available to occupants of residential properties, including views from gardens and domestic curtilage. Residential Visual Amenity is one component of 'Residential Amenity*." (Landscape Institute's Technical Note 2/19).

10.1.1.3 Planning law contains a widely understood principle that the outlook or view from a private property is a private interest and not therefore protected by either the Scottish or UK planning system, which generally has a focus on the public interest. However, the planning system also recognises situations where the effects on residential visual amenity are so serious as to become a matter of public interest. This matter has been examined at a number of public inquiries in Scotland and the rest of the UK where the key determining issue was not the identification of significant effects on views, but whether the Project would have an effect on the residential visual amenity through an 'overbearing' and / or 'dominating' effect resulting in unsatisfactory living conditions, leading to a property being regarded, objectively, as an unattractive (as opposed to a less attractive) place in which to live. The effects on residential amenity are subsequently considered as part of the planning balance as part of the consent process.

10.1.1.4 Consequently, the RVAA methodology provides for a much more detailed assessment of the closest residential properties to the Project. This allows the assessor and consequently the determining authority to make a judgement as to whether the residents at these residential properties would be likely to sustain unsatisfactory living conditions which it would not be in the public interest to create. Reviews of decisions demonstrate that significant visual effects or changes to the views available from a residential property and its curtilage are not the decisive consideration, rather it is the residential amenity and, in this case, residential visual amenity that is determinate.

10.1.1.5 The methodology for RVAA accords with the advice in GLVIA3, and the Landscape Institute's Technical Note 2/19 (the 'RVAA guidance'). It involves a four-step process as follows:

- "*Step 1: Define study area and scope of the assessment;"*
- *"Step 2: Evaluate baseline visual amenity at properties to be included having regard to the landscape and visual context and the development proposed;"*
- *"Step 3: Assessment of likely change to visual amenity of included properties in accordance with GLVIA3 principles and processes;* and*"*
- *"Step 4: Further assessment of predicted change to visual amenity of properties to be included forming a judgement with respect to the Residential Visual Amenity Threshold*."

10.1.1.6 Other factors affecting residential amenity such as noise and shadow flicker are not considered as part of this assessment.

10.2 Step 1: scope of assessment

10.2.1.1 Residential properties within the closest proximity to the onshore Project infrastructure with the potential to be significantly affected by views of the Project and therefore most likely to be subject to potential effects on their residential visual amenity have been included in the assessment as follows:

- onshore substations: residential properties within 500 metres (m) of the maximum design scenario;
- primary construction compounds: residential properties within 100m; and
- onshore export cable corridor and related infrastructure including the landfall(s), trenchless crossings, and secondary construction compounds: residential properties within 50m.

10.2.1.2 These study areas have been selected based on the RVAA guidance which advises on study areas as follows:

"*When assessing relatively conspicuous structures such as wind turbines, and depending on local landscape characteristics, a preliminary study area of approximately 1.5 - 2km radius may initially be appropriate in order to begin identifying properties to include in a RVAA. However, other development types including potentially very large but lower profile structures and developments such as road schemes and housing are unlikely to require RVAA, except potentially of properties in very close proximity (50-250m) to the development. For example, when assessing effects of overhead transmissions lines, generally only those properties within 100 – 150 metres of the finalised route are potentially considered for inclusion in a RVAA*."

10.2.1.3 A residential property, for the purposes of environmental impact assessment, should be one that was designed and built / converted for that purpose and currently (at the time of the assessment) remains in a habitable condition (is of a safe construction, wind and watertight with appropriate access, and services such as drinking water and sanitation). Other buildings such as barns / outbuildings, garages, huts and derelict properties should generally be excluded from the assessment, unless they form part of the curtilage of an existing residence.

10.2.1.4 The assessment of residential properties or clusters of residential properties has been limited to those which appear on the OS 1:25,000 km scale map and are overlapped by the blade tip ZTV.

10.3 Step 2: site survey and baseline reporting

10.3.1.1 The assessment has been informed by site visits, observing the properties from public locations and through the examination of publicly available aerial and ground level photography as well as map-based data, the production of ZTV plots and visualisations such as wirelines. Some of the properties are accessed via private or gated roads and due to these access limitations, they have been assessed from the nearest public road or footpath which may be at greater distance from the property. As such the assessment represents an informed judgement of the likely visual effects and the consequential effects on residential visual amenity.

10.3.1.2 Each property included in the RVAA has been described in terms of the type, nature, extent and quality of the views that may be experienced 'in the round' from the dwelling itself and the domestic curtilage which includes the main living areas, usually the ground floor and the main garden and immediate driveway. The relationship of the property with the surrounding

landscape and a description of the views in terms of whether they may be considered as primary, secondary or peripheral views.

10.3.1.3 The assessment allows for the screening effects of vegetation with the following caveats:

- Forestry screening: this is subject to forestry management and the assessment allows for either no forestry screening or maximum forestry screening, representing the two extremes likely to affect the view during the Project lifetime.
- Woodland and hedgerow screening: where this includes mature, long standing mixed or broadleaved woodland a degree of permanence has been assumed in the assessment.
- Individual trees: where these are mature a degree of permanence has been assumed in the assessment. However, this is subject to the long-term retention of individual trees that would need to be assessed on a case-by-case basis, which is beyond the scope of this assessment.
- Garden vegetation: this has been assumed to have a degree of permanence. If it is removed and replanted, most garden shrubs / hedges are reasonably quick to re-establish or are replaced on a piecemeal basis.

10.3.1.4 The assessment takes account of the likely views from the ground floors of properties and main garden areas but excludes upper floors and other land that may relate to the property and is not part of the main living areas.

10.4 Step 3: visual assessment

10.4.1.1 A visual assessment is undertaken to identify those properties where a significant visual effect on a view from the property is likely to occur. The methodology for this is set out previously under visual assessment and combines an assessment of 'sensitivity' with an assessment of 'magnitude'.

10.4.1.2 The sensitivity of individual residential receptors has been assessed as 'High' in each case due to the high susceptibility of residents in accordance with GLVIA3, paragraph 6.33. The value of the view is also likely to be regarded as high by the residents themselves but should also reflect any national or local designations for scenic value.

10.4.1.3 The assessment is supported by aerial and ground level photography as well as map-based data, the production of ZTV plots and visualisations such as wirelines and photographs where appropriate, which are illustrated for each property.

10.5 Step 4: residential visual amenity assessment

10.5.1.1 The second stage is to consider the residential visual amenity and whether, in terms of the wider public interest, the visual effects would result in unsatisfactory living conditions, leading to a property being regarded, objectively, as an unattractive (as opposed to a less attractive) place in which to live. Relevant information considered as part of the assessment may include, but is not limited to the following:

- scale of Project:
  - maximum design scenario as defined in **Volume 1, Chapter 27**, Table 27.7;
  - duration; and
  - separation distance (between the Project and the residential receptor).

- description of property, as far as this can be ascertained:
  - orientation and size of property and whether views from the property towards the wind farm would be direct or oblique;
  - location of principal rooms and main living areas such as living / dining rooms, kitchens and conservatories, as opposed to upstairs rooms (bedrooms / bathrooms), working areas such as farm buildings and utility areas;
  - location of principal garden areas which may include patios and seating areas as opposed to less well used areas such as paddocks or garages; and
  - the effects of any screening by landform, vegetation or nearby built development.
- location and context:
  - the aspect of the property in terms of the overall use and relationship to the garden areas and surrounding landscape;
  - the principal direction of main views and visual amenity; and
  - the context and nature of any intervening structures for example, other existing wind farm development, farm buildings or forestry.

10.5.1.2 A final assessment is then made to determine if, in the assessor's opinion, the Residential Visual Amenity Threshold (RVAT) would be breached by the Project and as such should be considered further as part of the planning balance.

11. Production of ZTVs and Visualisations

11.1.1.1 ZTVs and visualisations (wirelines or wirelines and photomontages) are graphical images produced to assist and illustrate the LVIA and the cumulative assessment. The methodology use for viewpoint photography and photomontages has been produced in accordance with the SNH guidance on *Visual Representation of Wind Farms,* Version 2.2 (2017b), the *Guidelines for Landscape and Visual Impact Assessment*, Third Edition (GLVIA3) (Landscape Institute and IEMA, 2013) and the Landscape Institute Technical Guidance Note on *Visual Representation of Development Proposals* (2019b).

11.2 Methodology for production of ZTVs

11.2.1.1 The ZTVs in **Volume 2, Figures 27.2a-c and 27.3a-g** are calculated using ArcGIS software to generate the ZTV of the onshore infrastructure. This software creates a 3D computer model of the existing landform and the development using OS Terrain 5 data. This data provides a digital record of the existing landform of Great Britain, or Digital Terrain Model (DTM) at 5m grid squares. This is combined with a 3D model representing the specified geometry and position of the onshore Project infrastructure. The computer model includes the entire LVIA study area **and takes account of the effects caused by atmospheric refraction and the Earth's curvature.**

11.2.1.2 OS Vector map data has been used to add the screening effects of the main areas of buildings (8m tall) and woodland (12m tall) and these have been imprinted on to the OS Terrain 5 data. The resulting ZTV plots have then been overlaid on OS mapping at an appropriate scale and presented as figures using desktop publishing or graphic design software. There are limitations in this theoretical production, and these should be considered in the interpretation and use of the ZTV as follows:

- where the ZTV has been calculated using OS Terrain 5 this does not account for vegetation or built form unless added in the form of OS Vector map data or digitally added and stated on the figure. The OS Vector map data only accounts for the main blocks of buildings and vegetation, does not account for individual trees and hedges for example;
- where the ZTV has been calculated using OS LiDAR (Light Detection And Ranging) Composite only those surface features picked up by LiDAR data will be represented;
- the ZTVs are based on theoretical visibility from 2m above ground level; and
- the ZTV does not indicate the decrease in visibility that occurs with increased distance from the Project. The nature of what is visible at 2km distance will differ markedly from what is visible at 500m distance, although both could be indicated in the ZTV as having the same level of visibility.

11.2.1.3 These limitations mean that the ZTV should be used as a starting point in the assessment, providing an indication of where the Project would theoretically be visible. The ZTVs tend to present a ‘worst case’ or overestimate of the theoretical visibility. The information drawn from the ZTV is checked by field survey observation.

11.3 Methodology for baseline photography

11.3.1.1 Once a view has been selected, the location is visited, confirmed, and assessed with the aid of a wireline or similar visualisation in the field. A photographic record is taken to record

the view, and the details of the viewpoint location and associated data are recorded to assist in the production of visualisations and to validate their accuracy.

11.3.1.2 The following photographic information is recorded:

- date, time, weather conditions and visual range;
- GPS recorded 12 figure grid reference accurate to ~5-10m;
- GPS recorded Above Ordnance Datum height data;
- use of a fixed 50mm focal length lens is confirmed;
- horizontal FoV (in degrees); and
- bearing to Target Site.

11.3.1.3 The photographs used to produce the photomontages have been taken with a digital Single lens reflex (SLR) camera set to produce photographs equivalent to that of a manual 35mm SLR camera with a fixed 50mm focal length lens. The photographs has been taken on a tripod with a pano-head at a height of approximately 1.5m above ground.

11.3.1.4 All the resulting visualisations has been prepared to indicate other cumulative development in order that they may assist the cumulative assessment as well as the LVIA.

11.3.1.5 Whilst no two-dimensional image can fully represent the real viewing experience, the visualisation aims to provide a realistic representation of the Project, based on current information and photomontage methodology.

11.3.2 Weather conditions

11.3.2.1 GLVIA3 para 8.22 state – '*In preparing photomontages, weather conditions shown in the photographs should (with justification provided for the choice) be either*:

- *representative of those generally prevailing in the area; or*
- *taken in good visibility, seeking to represent a maximum visibility scenario when the development may be highly visible*'.

11.3.2.2 In preparing photomontages for the LVIA, photographs have been taken in favourable weather conditions. Weather conditions shown in the photographs for all viewpoints have, where possible, been taken during periods of 'very good' or 'excellent' visibility conditions, seeking to represent a maximum visibility scenario when the developments may be highly visible.

11.4 Methodology for production of visualisations

11.4.1.1 A photomontage is a visualisation that superimposes an image of a Project upon a photograph or series of photographs. Photomontage is a widespread and popular visualisation technique, which allows changes in views and visual amenity to be illustrated and assessed, within known views of the 'real' landscape.

11.4.1.2 To create the baseline panorama, the frames are individually cylindrically projected and then digitally joined to create a fully cylindrically projected panorama using Adobe Photoshop or PTGui software. This process avoids the wide-angle effect that would result should these frames be arranged in a perspective projection, whereby the image is not faceted to allow for the cylindrical nature of the full 360° view but appears essentially as a flat plane. Tonal alterations are made using Adobe software to create an even range of tones across the photographs once joined.

11.4.1.3 Visualisations that illustrate the Project, set within a computer-generated image of the landform has been used in the assessment to predict its theoretical appearance. This has been produced with a combination of Resoft WindFarm and 3D AutoCAD and was based on a terrain model with a 2m data grid (2m LiDAR data). There are limitations in the accuracy of DTM data so that landform may not be represented precisely and may result in differences in visibility, however, the use of 2m LiDAR data minimises these limitations.

11.4.1.4 Rendering of the onshore substations in the photomontages is as photorealistic as possible to the conditions shown in each viewpoint photograph. There is some variation in the appearance and visibility between the viewpoints, as they are rendered to suit the conditions shown in each of the different viewpoint photographs, which have some unavoidable degree of variation in terms of lighting and weather conditions. The key requirement is that the onshore substations have been rendered with sufficient contrast against the skyline backdrop to illustrate its maximum visibility scenario in each image.

11.4.1.5 Annotated baseline photographs have also been prepared to indicate the locations of the onshore Project infrastructure, and these have also been computer-generated from the 3D model but are not rendered as photomontages.

11.4.1.6 The completed set of visualisations and accompanying data are then presented as figures using desktop publishing / graphic design software.

11.4.1.7 The photographs and other graphic material such as wirelines and photomontages used in this assessment are for illustrative purposes only and, whilst useful tools in the assessment, they should not be considered as completely representative of what will be apparent to the human eye. The assessments are carried out from observations in the field and therefore may include elements that are not visible in the photographs.

11.5 Illustration of landscape planting strategy

11.5.1.1 Visualisations have been prepared to illustrate the **Volume 4: Outline Landscape and Architectural Strategy** which is proposed as an embedded environmental measure within the Project.

11.6 Limitations of visualisations

11.6.1.1 The photomontage visualisations used in the LVIA are for illustrative purposes only and, whilst useful tools in the assessment, are not considered to be completely representative of what will be apparent to the human eye. The assessments are carried out from observations in the field and therefore may include elements that are not visible in the photographs.

11.6.1.2 The photomontage visualisations of the onshore substations (and any development proposal) have a number of limitations when using them to form a judgement on visual effect. These include:

- a visualisation can never show exactly what a development will look like in reality due to factors such as: different lighting, weather and seasonal conditions which vary through time and the resolution of the image;
- the images provided give a reasonable impression of the scale and the distance to the Project, but can never be 100 per cent accurate to the as constructed effect;
- a static image cannot convey movement or reflection from the sun;
- the viewpoints illustrated are representative of views in the area but cannot represent visibility at all locations;

- to form the best impression of the effects, these images are best viewed at the viewpoint location shown;
- the images must be printed and viewed at the correct size (841mm x 297mm);
- images should be held flat at a comfortable arm's length. If viewing these images on a wall or board at an exhibition, stand at arm's length from the image presented to gain the best impression;
- it is preferable to view printed images rather than view images on screen. Images on screen should be viewed using a normal PC screen with the image enlarged to the full screen height to give a realistic impression; and
- there are practical limitations to shooting viewpoint photographs only in very good or excellent visibility and at particular times of day.

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13. Glossary of Terms and Abbreviations

13.1 Abbreviations

Acronym	Definition
AESLQ	Special Landscape Qualities – Guidance on assessing effects
CLVIA	Cumulative Landscape and Visual Impact Assessment
DTM	Digital Terrain Model
EIA	Environmental Impact Assessment
GLVIA3	Guidelines for Landscape and Visual Impact Assessment, 3rd Edition
Km	Kilometres
LiDAR	Light Detection And Ranging
LVIA	Landscape and Visual Impact Assessment
M	Metres
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
O&M	Operation and Maintenance
OS	Ordnance Survey
RVAA	Residential Visual Amenity Assessment
RVAT	Residential Visual Amenity Threshold
SLQ	Special Landscape Qualities
SLR	Single Lens Reflex camera
ZTV	Zone of Theoretical Visibility

13.2 Glossary of terms

Term	Definition
Digital Terrain Model	A digital representation of the Earth's natural land surface

MarramWind