Volume 5: Appendix 9.5 – LVIA and Visualisations Methodology

CONTENTS

LIST OF ABBREVIATIONS

CMLI: Chartered Members of the Landscape Institute

DTM: Digital Terrain Model

EIAR: Environmental Impact Assessment Report

FOV: Field of View

GDL: Gardens and Designed Landscapes

GIS: Geographical Information System

GLVIA3: *Guidelines for Landscape and Visual Impact Assessment, 3rd Edition*

LCT: Landscape Character Types

LOD: Limit of Deviation

LVIA: Landscape and Visual Impact Assessment

OHL: Overhead Line

RVAA: Residential Visual Amenity Assessment

SNH: Scottish Natural Heritage, now NatureScot

VRA: Visual Receptor Area

ZTV: Zone of Theoretical Visibility

1. INTRODUCTION

1.1.1 This appendix presents the detailed methodology used for the Kintore to Tealing 400 kV OHL Connection (the 'Proposed Development') Landscape and Visual Impact Assessment (LVIA), including cumulative assessment, which is outlined in **Volume 2, Chapter 9: Landscape and Visual Amenity** of the **Environmental Impact Assessment Report (EIAR)**.

1.1.2 Landscape and visual assessments are separate, although linked, processes. LVIA therefore considers the potential effects of a proposed development on:

- landscape as a resource in its own right (caused by changes to the constituent elements of the landscape, its specific aesthetic or perceptual qualities and the character of the landscape); and
- views and visual amenity as experienced by people (caused by changes in the appearance of the landscape).

1.1.3 Whilst landscape and visual effects are linked, this LVIA deals with landscape and visual effects separately, followed by an assessment of cumulative landscape and visual effects where relevant.

1.1.4 This appendix also sets out the approach to viewpoint photography, visualisation production and zone of theoretical visibility (ZTV) mapping. Visualisations are an important tool used to inform the LVIA process and to present representative images of the Proposed Development in the reporting of the assessments.

1.1.5 It should be read in conjunction with **Volume 2, Chapter 9: Landscape and Visual Amenity** and **Volume 1, Chapter 3: Project Description** of the EIAR for full details of the Proposed Development.

1.1.6 The methodology for the Residential Visual Amenity Assessment (RVAA) is set out in **Volume 5, Appendix 9.3: Residential Visual Amenity Assessment** and therefore not included in this appendix.

2. GUIDANCE

2.1 Introduction

2.1.1 This methodology has been developed by Chartered Landscape Architects (Chartered Members of the Landscape Institute (CMLI)) at LUC, who have extensive experience in the assessment of landscape and visual effects arising from electricity transmission infrastructure (eg overhead transmission lines (OHLs), substation infrastructure etc) and a wide range of other types and scale of development.

2.1.2 The methodology has been developed in accordance with the principles contained within the *Guidelines for Landscape and Visual Impact Assessment, 3rd Edition* (GLVIA3)[1]. NatureScot (formerly Scottish Natural Heritage (SNH)) cumulative assessment guidance[2] also informs the approach to the assessment of cumulative landscape and visual effects. Whilst this NatureScot guidance has been prepared in relation to onshore wind energy development, the overarching principles of cumulative assessment are of relevance to the assessment of all development types.

2.1.3 The methodology for the production of accompanying visualisations used in the LVIA is based on current good practice guidance as set out by NatureScot[3] and the Landscape Institute[4].

2.1.4 A full list of guidance that has been used to inform the LVIA is provided below.

2.2 Legislation

2.2.1 This assessment is carried out in accordance with the following legislation:

- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017[5]; and
- Electricity Act 1989 (Section 37)[6].

2.3 Policy

2.3.1 The following policies of relevance to the assessment have been considered:

- National Planning Framework 4[7] (NPF4) (esp. Policy 4 and 11);
- Angus Council Local Development Plan[8];
- Aberdeenshire Local Development Plan[9]; and
- Aberdeen City Local Development Plan[10].

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[1] The Landscape Institute and Institute of Environmental Management and Assessment, 2013. *Guidelines for Landscape and Visual Impact Assessment, 3rd Edition*.

[2] NatureScot, 2021. Assessing the cumulative impact of onshore wind energy developments.

[3] Scottish Natural Heritage, 2017. *Visual Representation of Wind Farms Guidance*, Version 2.2.

[4] The Landscape Institute, 2019. Technical Guidance Note 06/19: Visual Representation of Development Proposals.

[5] UK Government, 2017. *The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations (2017)*. [Online] Available at: https://www.legislation.gov.uk/ssi/2017/101/contents [Accessed 04/07/25].

[6] UK Government, 1989. *Electricity Act 1989, Section 37.* [Online] Available at: https://www.legislation.gov.uk/ukpga/1989/29/section/37 [Accessed 08/07/25].

[7] Scottish Government, 2023. National Planning Framework 4. [Online] Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2023/02/national-planning-framework-4/documents/national-planning-framework-4-revised-draft/national-planning-framework-4-revised-draft/govscot%3Adocument/national-planning-framework-4.pdf [Accessed 14/10/24].

[8] Angus Council, 2016. Angus Local Development Plan. [Online] Available at: https://www.angus.gov.uk/sites/angus-cms/files/Angus%20local%20development%20plan%20adopted%20September%202016.pdf [Accessed 14/10/24].

[9] Aberdeenshire Council, 2023. Aberdeenshire Local Development Plan. [Online] Available at: https://www.aberdeenshire.gov.uk/planning/plans-and-policies/ldp-2023 [Accessed 14/10/24].

[10] Aberdeen City Council, 2023. Aberdeen City Local Development Plan [Online] Available at: https://aberdeencity.gov.uk/services/planning-and-building-standards/local-development-plan/aberdeen-local-development-plan [Accessed 14/10/24].

2.4 Guidance

2.4.1 This assessment is carried out in accordance with the principles contained within the following documents:

- Landscape Institute and the Institute of Environmental Management and Assessment (2013) *Guidelines for Landscape and Visual Impact Assessment, 3rd Edition* ('GLVIA3');
- Scottish Natural Heritage (SNH) (2018) *A Handbook on Environmental Impact Assessment, Appendix 2: Landscape and Visual Impact Assessment*, Version 5;
- NatureScot (2021) *Assessing the cumulative impact of onshore wind energy developments*;
- Landscape Institute (2019) *Technical Guidance Note 06/19 Visual representation of development proposals*;
- Landscape Institute (2019) *Residential Visual Amenity Assessment (RVAA) Technical Guidance Note 2/19*;
- Landscape Institute (2021) *Assessing Landscape Value Outside National Designations, Technical Guidance Note 02/21;*
- Scottish Natural Heritage, 2017. Visual Representation of Wind Farms Guidance, Version 2.2; and
- SSEN Transmission (2023) *Procedures for Routeing Overhead Lines and Underground cables of 132kV and above* and *Annex 1: Holford Rules: Guidelines for the Routeing of New High Voltage Overhead Transmission Lines with NGC 1992 and SHETL 2003 Notes.*

3. SCOPE OF ASSESSMENT

3.1.1 An LVIA considers physical changes to the landscape as well as changes in landscape character. It also considers changes to areas designated for their scenic or landscape qualities, and the visual impacts of a proposed development on publicly available views as perceived by people.

3.1.2 All potentially Significant landscape and visual effects (including cumulative effects) are examined, including those relating to construction and operation of the Proposed Development.

3.1.3 Where, based on professional judgement, it is established that Significant effects are unlikely to occur, the assessment of potential effects on some receptors may be 'scoped out'. For an EIA development this is usually agreed at scoping stage, or through the iterative detailed design of the development through the EIA process. Effects assessed in full and effects scoped out of the LVIA are detailed in **Volume 2, Chapter 9: Landscape and Visual Amenity**. The scope of the assessment has also been informed through consultation with statutory and non-statutory consultees. Consultee responses and feedback to the scoping and pre-application consultation is provided in **Table 9.1: Summary of Relevant Consultation** in **Volume 2, Chapter 9: Landscape and Visual Amenity**.

4. LVIA ASSESSMENT METHODOLOGY

4.1 Study Area

4.1.1 The study area is determined by the nature and scale of the development proposed and the nature of the surrounding area (eg complex topography or extensive tree cover leading to visually enclosed areas which may limit the extent of likely Significant effects). For the purposes of the LVIA, the study area is defined as a 5 km wide offset to either side of the Alignment, as requested by Angus Council (see **Table 9.1: Summary of Relevant Consultation** in **Volume 2, Chapter 9: Landscape and Visual Amenity**). The study area is shown on **Volume 3, Figure 9.1: Landscape and Visual Impact Assessment Study Area**. Although the study area is based on the Alignment, access tracks and other associated infrastructure within the study area have also been considered within the LVIA.

4.1.2 The 5 km study area has been informed by professional judgement, the scale of the Proposed Development (as described in **Volume 1, Chapter 3: Project Description**), desked-based studies including ZTV analysis, and field studies and recommendations made within the EIA Scoping Opinion. Observations of existing high voltage OHLs in the surrounding landscape and their influence on landscape and visual amenity informed the study area. These suggest that visibility of open lattice towers recedes relatively quickly, and this type of structure is not prominent in longer-distance views. Based on these observations, and an understanding of the landscape, it is considered that significant landscape and visual effects as a result of the Proposed Development would be unlikely beyond 5 km.

4.1.3 The Scoping Report proposed that 3 km be used as the study area as significant effects beyond that were not considered likely, although more distant viewpoints up to 5 km were to be considered when appropriate. While accepted by Aberdeenshire Council, Angus Council requested an extension of the study area to 5 km either side of the Alignment. It was therefore considered appropriate to adopt that approach in both local authority areas to provide a precautionary approach.

4.2 Consideration of Horizontal and Vertical Limit of Deviation

4.2.1 The LVIA assesses the effects of the Proposed Development as it is described in **Volume 1, Chapter 3: Project Description**, and shown on **Volume 3, Figure 3.1.1 to 3.1.29: Proposed Development for which Section 37 Consent (*Electricity Act, 1989*) is sought**. The description and figures show specified tower locations along the Proposed Alignment, and the height of each tower. This Alignment is modelled into the visualisations and has informed the assessment of effects.

4.2.2 The LVIA also considers the horizontal and vertical Limit of Deviation (LOD). Full details of the horizontal and vertical LODs are provided in **Volume 1, Chapter 3: Project Description**, and are summarised below:

- the horizontal LOD allows for micrositing of the Operational Corridor up to 100 m either side of the OHL alignment centre line for suspension towers and OHL conductors, and 200 m for tension towers[11]; and
- the vertical LOD allows for an increase or decrease in tower height up to a maximum of 9 m.

4.2.3 Where the horizontal or vertical LODs are considered to allow a design that would result in a different level of effect than that found for the Proposed Alignment, commentary is provided with a separate judgement of effects where necessary. Refer to **Volume 1, Chapter 3: Project Description, Section 3.6 Management of Micrositing Within LOD** for further detail.

4.2.4 The vertical LOD (VLOD) is indicated as a marker above each tower on visualisations for viewpoints within 2 km of the Proposed Alignment. It is considered that from viewpoints beyond 2 km from the Proposed Alignment, potential increases or decreases in tower height of up to 9 m would not result in findings that differ from the assessment of the designed tower heights. The LVIA visualisation package is presented in **Volumes 4a to 4c: Visualisations**.

4.2.5 The horizontal LOD (HLOD) is not illustrated in the LVIA visualisation package. Although the HLOD provides flexibility for micrositing of infrastructure, the location of towers as per the Proposed Alignment is considered to be the most realistic and likely project scenario. Given that the EIAR requires consideration of likely significant effects, the visualisations therefore illustrate the most realistic and likely locations of towers based on the Proposed Alignment and not the HLOD. The extent of the

[11] The Operational Corridor (45 m either side of the centre line) would not extend outside of the horizontal LOD (See **Volume 1, Chapter 3: Project Description**).

HLOD, including agreed restrictions, is shown on **Volume 3, Figures 9.1 to 9.4** (**Figure 9.1: Landscape and Visual Impact Assessment Study Area**, **Figure 9.2a: Landscape Character Types Overview**, **Figures 9.2b.1 to 9.2b.6: Landscape Character Types**, **Figures 9.2c.1 to 9.2c.6: Landscape Character Types with Overhead Line Tower Height Zone of Theoretical Visibility (ZTV)**, **Figure 9.3a: Overhead Line with Viewpoint Locations**, **Figures 9.3b.1 to 9.3b.6: Visual Receptor Area, Viewpoint Locations with Overhead Line Tower Height Zone of Theoretical Visibility (ZTV)**, **Figures 9.4a.1 to 9.4a.6: Designated Landscapes** and **Figures 9.4b.1 to 9.4b.6: Designated Landscapes with Overhead Line Tower Height Zone of Theoretical Visibility (ZTV)**) and **Volume 3, Figures A9.3.1a to A9.3.1y: Residential Properties within 225 m of Proposed Development**.

4.2.6 It should also be noted that prior to any change being made to the Proposed Alignment within the horizontal or vertical LODs, a change control process would be undertaken to ensure that there is no unacceptable increase in adverse impacts as a result of the change. Where there is a requirement to vary the location (or height) of infrastructure within the LODs, the relevant environmental information within the EIAR would be reviewed to establish any potential constraints or significant adverse change in effect compared with those reported in the EIAR.

4.3 Methodological Overview

4.3.1 The key steps in the methodology for assessing landscape and visual effects are as follows:

- the landscape baseline of the study area is analysed and landscape receptors identified, informed by desk study and field survey (see **Section 5.1**);
- the area over which the development would potentially be visible is established through the creation of an initial ZTV plan[12] (see **Section 8**);
- the visual baseline is recorded in terms of the different receptors (groups of people) who may experience views of the development (informed by the initial ZTV), and the nature of their existing views and visual amenity (see **Section 6.1.2**);
- Visual Receptor Areas (VRAs) are defined to group visual receptors, based on their geographical location, similarities between the likely nature and extent of views, and distance from the Proposed Development (see **Section 6.2.3**);
- assessment viewpoints are selected (see **Table 9.2: Representative Viewpoint Locations** in **Volume 2, Chapter 9: Landscape and Visual Amenity**), as advocated by GLVIA3, to represent a range of different receptors and views, (in consultation with Angus Council, Aberdeenshire Council, Aberdeen City Council and NatureScot), including:
  - "***Representative viewpoints**, selected to represent the experience of different types of visual receptor, where larger numbers of viewpoints cannot all be included individually and where the significant effects are unlikely to differ – for example, certain points may be chosen to represent the views of users of particular public footpaths and bridleways;*
  - ***Specific viewpoints**, chosen because they are key and sometimes promoted viewpoints within the landscape, including for example specific local visitor attractions, viewpoints in areas of particularly noteworthy visual and/or recreational amenity such as landscapes with statutory landscape designations, or viewpoints with particular cultural landscape associations; and*
  - ***Illustrative viewpoints**, chosen specifically to demonstrate a particular effect or specific issues, which might, for example, be the restricted visibility at certain locations"* (GLVIA3, Para 6.19, Page 109)".
- likely Significant effects on both the landscape as a resource and visual receptors are identified; and
- the level and significance of landscape and visual effects are judged with reference to the nature of the receptor (commonly referred to as the sensitivity of the receptor), which considers both susceptibility and value (see **Section 5.2** and **6.2**), and the nature of the effect (commonly referred to as the magnitude of change), which considers a combination of judgements including size/scale, geographical extent, duration and reversibility (see **Sections 5.3** and **6.3**).

[12] A ZTV indicates areas from where a development is theoretically visible, but they cannot show what it would look like, nor indicate the nature or magnitude of landscape or visual impacts.

4.4 Duration of Construction and Operational Effects

4.4.1 The assessment of landscape and visual effects includes consideration of effects arising during both the construction phase and the operational phase of the Proposed Development. Construction effects would be temporary and short-term (5 year construction period) and are expected to arise from activities such as site clearance, construction of access tracks, construction compounds and tower foundations. Upon completion of construction, and where possible, disturbed landscape features such as ground cover and vegetation would be returned to its original condition. As such, construction effects are considered to be partially reversible. Operational effects would be experienced over the lifetime of the Proposed Development and would primarily relate to the presence of towers, conductors and permanent access tracks in the landscape. As such, operational effects are considered to be long-term and partially reversible.

4.5 Description of Effects

4.5.1 Effects are described as being **Negligible**, **Minor**, **Moderate** or **Major** (see **Section 5.4** and **6.4**). **Moderate** and **Major** effects are considered **Significant** in the context of the EIA Regulations.

4.5.2 As required by the EIA Regulations[13], the assessment must identify the effects as either beneficial or adverse.

4.5.3 The direction of landscape, visual and cumulative effects (beneficial or adverse) is determined in relation to the degree to which the proposal fits with the existing landscape character or views, and the contribution to the landscape or views that a proposed development makes, even if it is in contrast to the existing character of the landscape or views. LVIA is required to take an objective approach. Therefore, to address the 'maximum case effect' situation, potential landscape and visual effects relating to the introduction of electricity transmission infrastructure are generally assumed to be adverse.

[13] UK Government, 2017. The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. [Online] Available at: https://www.legislation.gov.uk/ssi/2017/101/contents.

5. METHOD FOR ASSESSING LANDSCAPE EFFECTS

5.1 Introduction

5.1.1 As outlined in GLVIA3, *"an assessment of landscape effects deals with the effects of change and development on landscape as a resource"* (GLVIA3, Para 5.1, Page 70). Changes may affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.

5.1.2 An assessment of landscape effects requires consideration of the nature of landscape receptors (sensitivity of receptor) and the nature of the effect on those receptors (magnitude of change). GLVIA3 states that the nature of landscape receptors, commonly referred to as their sensitivity, should be assessed in terms of the susceptibility of the receptor to the type of change proposed, and the value attached to the receptor. The nature of the effect on each landscape receptor, commonly referred to as its magnitude, should be assessed in terms of size and scale of effect, geographical extent, duration and reversibility.

5.1.3 These aspects are considered together, to form a judgement regarding the overall significance of landscape effects (GLVIA3, Figure 5.1 Page 71). The following sections set out the methodology used to evaluate sensitivity and magnitude.

5.2 Sensitivity of Landscape Receptors

5.2.1 The sensitivity of a landscape receptor to change is assessed in terms of the susceptibility of the receptor to the type of change proposed, and the value attached to the receptor. Criteria for making these judgements are set out below.

Susceptibility of Landscape Receptors

5.2.2 Susceptibility is defined by GLVIA3 as "*the ability of the landscape receptor (whether it be the overall character or quality/condition of a particular type or area, or an individual element and/or feature, or a particular aesthetic and perceptual aspect) to accommodate the proposed development without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies*" (GLVIA3 paragraph 5.40).

5.2.3 A series of criteria are used to evaluate the susceptibility of Landscape Character Types (LCTs) to electricity transmission infrastructure as set out in **Table 9.5.1: Aspects Influencing Susceptibility of Landscape Receptors to Electricity Transmission Infrastructure** below. Aspects of these criteria are drawn from a range of published sources relating to electricity transmission infrastructure, including the *Holford Rules*[14], The *Horlock Rules*[15] and GLVIA3.

5.2.4 Landscape susceptibility is recorded as **High**, **Medium** or **Low**.

Table 9.5.1: Aspects Influencing Susceptibility of Landscape Receptors to Electricity Transmission Infrastructure

Criteria	Aspects indicating greater susceptibility to electricity transmission infrastructure	← →	Aspects indicating reduced susceptibility to electricity transmission infrastructure
Scale	Smaller Scale	← →	Larger Scale
Topography and landform	Presence of strong topographical variety or distinctive landform features Absence of strong topographical variety, featureless, convex or flat with little opportunity for screening and back clothing of electricity transmission infrastructure	← →	Undulating and valley landscapes which offer opportunities for screening and back clothing of electricity transmission infrastructure
Landcover, pattern and complexity	Limited woodland/forestry cover to help reduce views of electricity transmission infrastructure (eg providing screening or back clothing of infrastructure) Complex Rugged and irregular	← →	Extensive areas of woodland/forestry cover to reduce views of electricity transmission infrastructure (eg providing screening or back clothing of infrastructure) Simple, regular or uniform

[14] The Holford Rules: Guidelines for the Routeing of New High Voltage Overhead Transmission Lines (with NGC 1992 and SHETL 2003 Notes).

[15] The Horlock Rules: NGC Substations and the Environment: Guidelines on Siting and Design (2006).

Criteria	Aspects indicating greater susceptibility to electricity transmission infrastructure	← →	Aspects indicating reduced susceptibility to electricity transmission infrastructure
Settlement and man-made influence	Absence of modern development Presence of small scale, historic or vernacular settlement	← →	Presence of contemporary structures eg utility, infrastructure or industrial elements
Ridges and Skylines	Distinctive, undeveloped skylines Skylines that are highly visible over large areas or exert a large influence on landscape character Skylines with important historic landmarks	← →	Non-prominent/screened skylines Presence of existing modern man-made features (eg other electricity transmission infrastructure, telecommunications masts or wind turbines)
Inter-visibility with adjacent landscapes	Strong inter-visibility with sensitive landscapes Forms an important part of a view from sensitive viewpoints Visually open	← →	Little inter-visibility with adjacent sensitive landscapes or viewpoints Visually enclosed
Perceptual aspects	Remote from visible or audible signs of human activity and development	← →	Close to visible or audible signs of human activity and development

Value of Landscape Receptors

5.2.5 The European Landscape Convention advocates that all landscape is of value, whether it is the subject of defined landscape designation or not: "*The landscape is important as a component of the environment and of people's surroundings in both town and country and whether it is ordinary landscape or outstanding landscape*."[16] The Landscape Institute also provides guidance on assessing landscape value outside of national landscape designations[17] which has been used to inform the LVIA. The value of a landscape receptor is recognised as being a key contributing factor to the sensitivity of landscape receptors.

5.2.6 The value of landscape receptors is determined with reference to:

- review of relevant designations and the level of policy importance that they signify (such as landscapes designated at international, national or local level); and/or
- application of criteria that indicate value (such as scenic quality, rarity, recreational value, representativeness, conservation interests, perceptual aspects and artistic associations) as described in GLVIA3, paragraphs 5.44 - 5.47.

5.2.7 In addition to the above, judgements regarding value are also informed by fieldwork.

5.2.8 Landscape value is described as being **High**, **Medium** or **Low**, as set out in **Table 9.5.2: Value of Landscape Receptors** below.

Table 9.5.2: Value of Landscape Receptors

Value	Indicative Criteria
High	Landscapes with high scenic quality, high conservation interest, recreational value, important cultural associations or a high degree of rarity. Areas or features designated at a national level eg National Parks or National Scenic Areas (NSAs) or key features of these with national policy level protection.
Medium	Landscapes potentially designated at a regional or local level eg Regional Scenic Areas (RSAs), Special Landscape Areas (SLAs) or similar, or areas which in part may be designated in relation to their scenic quality or distinctiveness eg Forest Parks or Conservation Areas.
Low	Landscape of poor condition and intactness with limited aesthetic qualities, or of character that is widespread. Areas or features that are not formally designated.

[16] Council of Europe, 2000. Explanatory Report to the The European Landscape Convention – Council of Europe Treaty Series No. 176.

[17] Landscape Institute, 2021. Technical Guidance Note 02/21 Assessing landscape value outside national designations.

Combining Susceptibility and Value

5.2.9 There may be a complex relationship between the value attached to a landscape and the susceptibility of the landscape to a specific change. Therefore, the rationale for judgements on the sensitivity of landscape receptors needs to be clearly set out for each receptor. It should be noted that whilst landscape designations at an international or national level are likely to be accorded the highest value, it does not necessarily follow that such landscapes all have a high susceptibility to all types of change, and conversely, undesignated landscapes may also have high value and susceptibility to change (GLVIA3, Page 90).

5.2.10 The sensitivity of a landscape receptor to change is defined as **High**, **Medium** or **Low** and is based on weighing up professional judgements regarding susceptibility and value, as set out in **Table 9.5.3: Sensitivity of Landscape Receptors** below.

Table 9.5.3: Sensitivity of Landscape Receptors

Sensitivity	Definition
High	Landscapes which by nature of their character would be less able to accommodate development without change in character, due to their relatively higher susceptibility to the type of change proposed, and / or the higher value placed upon them by society.
Medium	Landscapes which by nature of their character would be able to accommodate development, subject to careful siting and design, due to their more moderate susceptibility to the type of change proposed, and / or relatively moderate value placed upon them by society.
Low	Landscapes which by nature of their character would be more able to accommodate development without substantive change in character, due to their relatively lower susceptibility to the type of change proposed, and / or lower value placed upon them by society.

5.3 Magnitude of Landscape Change

5.3.1 The overall judgement of magnitude of a landscape change is based on combining professional judgements on size and scale, geographical extent, duration and reversibility. Further information on the criteria is provided below.

Scale of Effect

5.3.2 For landscape elements/features this depends on the extent of existing landscape elements that would be lost or changed, the proportion of the total extent that this represents, and the contribution of that element to the character of the landscape.

5.3.3 In terms of landscape character, this reflects the degree to which the character of the landscape would change as a result of removal or addition of landscape components, and how the changes would affect key characteristics.

5.3.4 The scale of the effect is described as being **Large**, **Medium**, **Small**, or **Barely Perceptible**.

Geographical Extent of Effect

5.3.5 The geographical extent over which the landscape effect would arise is described as being **Large** (widespread or scale of the LCT, affecting several landscape types or character areas), **Medium** (more immediate surroundings) or **Small** (localised, for example at a site level).

Duration of Effect

5.3.6 GLVIA3 states at paragraph 5.51 that *'Duration can usually be simply judged on a scale such as short term, medium term or long term.*' For the purposes of the assessment, duration is determined in relation to the length of the construction period and the operational lifespan of the Proposed Development, as follows:

- **Short-term** effects are those that occur during construction, and may extend into the early part of the operational phase, eg construction activities (lasting 0 - 5 years); and
- **Long-term** effects are those which occur throughout the operational phase, eg presence of electricity transmission infrastructure (lasting 5 - 80 years).

Reversibility of Effect

5.3.7 In accordance with the principles contained within GLVIA3, reversibility is reported as **reversible, partially reversible** or **irreversible** (ie permanent), and is related to whether the change can be reversed at the end of the phase of development under consideration (ie at the end of construction or at the end of the operational lifespan of the development).

Combining the Judgements

5.3.8 Judgements on the magnitude of landscape change are recorded as **High, Medium, Low** or **Barely Perceptible** and are guided by **Table 9.5.4: Magnitude of Landscape Change** below, based on combining professional judgements on scale, geographical extent, duration and reversibility.

Table 9.5.4: Magnitude of Landscape Change

	Higher	← →	Lower
Scale	Extensive loss of landscape features and/or elements, and/or change in, or loss of key landscape characteristics, and/or creation of new key landscape characteristics	← →	Limited loss of landscape features and/or elements, and/or change in or loss of some secondary landscape characteristics
Geographical Extent	Change in landscape features and/or character extending considerably beyond the immediate site and potentially affecting multiple LCTs/areas	← →	Change in landscape features and/or character extending contained within or local to the immediate site and affecting only a small part of the LCT/area
Duration	Changes experienced for a longer period of more than 5 years	← →	Changes experienced for a shorter period of 5 years or less
Reversibility	Change to features, elements or character which cannot be undone or are only partly reversible after a long period	← →	A temporary landscape change which is largely reversible following the completion of construction, or decommissioning of the development

5.4 Judging Levels of Landscape Effect and Significance

5.4.1 The final step in the assessment requires the judgements of sensitivity and magnitude of change to be combined to make an informed professional assessment on the significance of each landscape effect (GLVIA3, Figure 5.1, Page 71).

5.4.2 A numerical scoring or rigid matrix-type approach, where the level of effect would be defined simply based on the level of sensitivity of the receptor combined with the magnitude of change, is not considered appropriate. Instead, consideration is given to the relative importance of each aspect, which then informs the overall decision. This determination requires the application of professional judgement and experience to take on board the many different variables which need to be considered, and which are given different weight according to site-specific and location-specific considerations in every instance. Judgements are made on a case by case basis, guided by the principles set out in **Diagram 9.5.1: Judging levels of effect - Landscape or Visual (including cumulative)** and the example descriptions/definitions detailed in **Table 9.5.5: Level and Significance of Landscape Effects**.

5.4.3 Levels of effect are identified as **Negligible**, **Minor**, **Moderate** or **Major** as set out in **Table 9.5.5: Level and Significance of Landscape Effects**, where **Moderate** and **Major** effects are considered **Significant** in the context of the EIA Regulations.

Diagram 9.5.1: Judging levels of effect - Landscape or Visual (including cumulative)

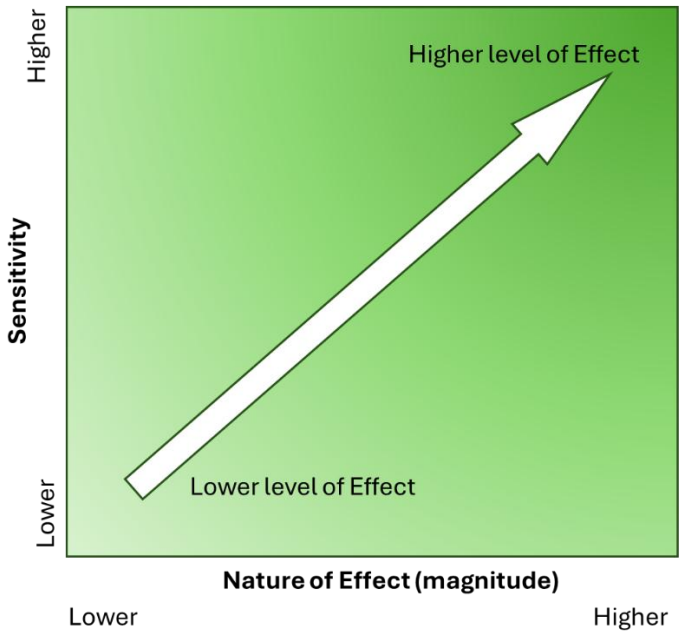

Table 9.5.5: Level and Significance of Landscape Effects

Level and Significance of Landscape Effect	Indicative Description
Major (Significant)	The proposed development would result in an obvious change in landscape characteristics and character, likely affecting a landscape with a **Moderate** or **High** susceptibility to that type of change. This level of effect may also occur when a **medium** scale of effect acts on a nationally valued landscape. The effect is likely to be long-term and affect a relatively large area.
Moderate (Significant)	The proposed development would result in a noticeable change in landscape characteristics and character, likely affecting a landscape with a **Moderate** susceptibility to that type of change. This level of effect may also occur when a smaller scale of effect acts on a more widely valued landscape, or a larger scale of effect acting on a landscape valued at a more local level. This level of effect may also occur when a large scale of effect occurs over a relatively short period or over a small area.
Minor (Not Significant)	The proposed development would result in a small change in landscape characteristics and character over a long-term duration. This level of effect may also occur when a larger scale of effect is of short-term duration or confined to the Site.
Negligible (Not Significant)	The proposed development would not result in a noticeable (barely perceptible) change in landscape characteristics/character.

6. METHOD FOR ASSESSING VISUAL EFFECTS

6.1 Introduction

6.1.1 As outlined in GLVIA3 "*An assessment of visual effects deals with the effects of change and development on views available to people and their visual amenity*" (GLVIA3, Para 6.1, Page 98). Changes in views may be experienced by people at different locations within the study area including from static locations (normally assessed using representative viewpoints) and whilst moving through the landscape (normally referred to as sequential views, eg from roads and walking routes).

6.1.2 Visual receptors are individuals or groups of people who may be affected by changes in views and visual amenity. For the purposes of this LVIA, visual receptors have been grouped into geographical areas across the study area which are referred to as 'visual receptor areas' (VRAs). Each VRA generally contains a range of visual receptor types (eg residents, road users, recreational users etc) and have been grouped based on their geographical location, similarities between the likely nature and extent of views, and distance from the Proposed Development. Visual effects are therefore assessed through this receptor based approach, with each VRA assessed and a range of viewpoints used to inform and support the visual assessment.

6.1.3 VRAs are assessed on a 'worst case' basis, ie the VRA assessment reports on the maximum level of effect that would be experienced by any receptor in that location, even though other receptors within the VRA may experience lower levels of effect.

6.1.4 GLVIA3 states that the sensitivity of visual receptors should be assessed in terms of the susceptibility of the receptor to change in views and/or visual amenity and the value attached to particular views. The magnitude of change should be assessed in terms of the size and scale, geographical extent, duration and reversibility of the effect.

6.1.5 These aspects are considered together, to form a judgement regarding the overall significance of visual effect (GLVIA3, Figure 6.1, Page 99). The following sections set out the methodology used to evaluate sensitivity and magnitude.

6.2 Sensitivity of Visual Receptors

6.2.1 The sensitivity of a visual receptor to change is assessed in terms of the susceptibility of the receptor to the type of change proposed, and the value attached to the view. Criteria for making these judgements are set out below.

Susceptibility of Visual Receptors

6.2.2 The susceptibility of visual receptors to changes in views/visual amenity is a function of the occupation or activity of people experiencing the view and the extent to which their attention is focused on views (GLVIA 3, para 6.32). This is recorded as **High**, **Medium** or **Low** informed by **Table 9.5.6: Susceptibility of Visual Receptors**.

Table 9.5.6: Susceptibility of Visual Receptors

High	Medium	Low
Viewers whose attention or interest is focussed on their surroundings, including: • communities where views contribute to the landscape setting enjoyed by residents; • people engaged in outdoor recreation (including users of cycle routes, footpaths and public rights of way, whose interest is likely to be focused on the landscape); and • visitors to heritage assets or other attractions where views of surroundings are an important contributor to experience; formal or promoted stopping places on scenic or tourist routes.	Viewers whose attention or interest is somewhat focused on their surroundings, including: • people travelling in vehicles on scenic routes and tourist routes, where attention is focused on the surrounding landscape, but is transitory; and • people at their place of work whose attention is primarily focused on the surroundings and where setting is important to the quality of working life.	Viewers whose attention or focus is not principally on their surroundings, including: • people travelling more rapidly on more major roads, rail or transport routes (not recognised as scenic routes); • people engaged in outdoor sport or recreation which does not involve or depend upon appreciation of views of the landscape; and • people at their place of work whose attention is not on their surroundings (and where setting is not important to the quality of working life).

Value of View or Visual Amenity

6.2.3 GLVIA3 also requires evaluation of the value attached to the view or visual amenity and relates this to planning designations and cultural associations (GLVIA3, Para. 6.37, Page 114).

6.2.4 Recognition of the value of a view is determined with reference to:

- planning designations specific to views or scenic quality;
- whether it is recorded as important in relation to designated landscapes (such as views specifically mentioned in the special qualities of a National Scenic Area (NSA));
- whether it is recorded as important in relation to heritage assets (such as designed views recorded in citations of Gardens and Designed Landscapes (GDL) or views recorded as of importance in Conservation Area Appraisals);
- the scenic or panoramic qualities that people may enjoy, including the breadth and depth of the view, its visual diversity, and its distinctiveness; and
- the value attached to views by visitors, for example through appearances in guide books or on tourist maps, provision of facilities for their enjoyment and references to them in literature and art.

6.2.5 A designated viewpoint or scenic route advertised on maps and in tourist information, or which is a significant destination in its own right, such as a Munro summit, is likely to indicate a view of higher value. High value views may also be recognised in relation to the special qualities of a designated landscape or heritage asset, or it may be a view familiar from photographs or paintings.

6.2.6 Views experienced from viewpoints or routes not recognised formally or advertised in tourist information, or which are not provided with interpretation or, in some cases, formal access, are likely to be of lower value.

6.2.7 Judgements on the value of views or visual amenity are described as being **High**, **Medium** or **Low**, as set out in **Table 9.5.7: Value of Views and Visual Amenity**.

Table 9.5.7: Value of Views and Visual Amenity

Value	Indicative Criteria
High	Views may be recorded in management plans, guide books, and/or which are likely to be experienced by large numbers of people. Views may be associated with internationally or nationally designated landscapes; designed views recorded in citations for GDLs/Scheduled Monuments etc. Views may be panoramic, highly distinctive, and/or have high scenic quality.
Medium	Views may be associated with regionally or locally designated landscapes; designed views recorded in citations for historic parks, gardens designated at a regional or local level, or documented in local planning policy (eg landmark hills/views, promoted viewpoints). Views may have some scenic value or visual diversity.
Low	Views which are not documented or protected but may be valued at a local level. Views which are more incidental, and less likely to be associated with somewhere people travel to or stop, or which may be experienced by smaller numbers of people. Views may have limited visual interest.

Combining Susceptibility and Value

6.2.8 The sensitivity of visual receptors may involve a complex relationship between their susceptibility to change and the value attached to a view. Therefore, the rationale for judgements of sensitivity is clearly set out for each receptor in relation to both its susceptibility (to the type of change proposed) and the value of the view.

6.2.9 The sensitivity of a visual receptor to change is defined as **High**, **Medium** or **Low** and is based on weighing up professional judgements regarding susceptibility and value, and each of their component considerations, as set out in **Table 9.5.8: Sensitivity of Visual Receptors**.

Table 9.5.8: Sensitivity of Visual Receptors

Sensitivity	Definition
High	Larger numbers of viewers and / or those with proprietary interest and prolonged viewing opportunities such as residents and users of attractive and well-used recreational facilities. The value attached to the existing view is likely to be high.
Medium	Small numbers of residents or moderate numbers of recreational viewers with an interest in their environment. Larger numbers of recreational road users. The value attached to the existing view is likely to be medium.
Low	Small numbers of recreational viewers with interest in their surroundings. Viewers with a passing interest not specifically focussed on the landscape eg workers, commuters. The value attached to the existing view is likely to be low.

6.3 Magnitude of Visual Change

6.3.1 The overall judgement of magnitude of visual change (nature of visual effect) is based on weighing up professional judgements on scale, geographical extent, duration and reversibility. Further information on the criteria is provided below.

Scale

6.3.2 The scale of a visual change depends on:

- 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, including the proportion of the view occupied by the Proposed Development;
- the degree of contrast or integration of any new features or changes in the landscape with the existing or remaining landscape elements and characteristics in terms of form, scale and mass, line, height, colour and texture; and
- the nature of the view of the Proposed Development, in terms of the relative amount of time over which it would be experienced and whether views would be full, partial or glimpsed.

6.3.3 All changes are assumed to be during Winter, representing a 'maximum effect' scenario with minimal screening by deciduous vegetation and trees. Wireframes and ZTVs prepared to illustrate potential visual effects are initially calculated on the basis of a 'Bare Earth' Digital Terrain Model (DTM) and therefore demonstrate the maximum extent of visibility possible, in the absence of buildings, woodland, vegetation or other surface features which may otherwise screen or filter views of the Proposed Development.

6.3.4 Where known surface features such as commercial forestry are present, consideration is given to potential changes in the existing composition felling regimes where screening provided by existing forestry is likely to change notably during the lifetime of the Proposed Development.

6.3.5 In this assessment scale of visual change is described as being **Large**, **Medium**, **Small** or **Barely perceptible**.

Geographical Extent

6.3.6 The geographical extent of a visual change records the geographical area where the changes would be visible and describes the locations where the effects would be most concentrated.

Duration

6.3.7 The duration of visual effects is reported as **short-term** or **long-term**, as defined for the duration of landscape effects (see **paragraph 5.3.6**).

Reversibility

6.3.8 Reversibility is reported as **irreversible** (ie permanent), **partially reversible** or **reversible**, and is related to whether the visual change can be reversed at the end of the phase of development under consideration (ie at the end of construction or at the end of the operational lifespan of the development). Operational visual effects associated with the Proposed Development have been considered to be irreversible due to the lengthy anticipated operational lifetime of the infrastructure and long-term transmission network requirements.

Combining the Judgements

6.3.9 Judgements on the magnitude of visual change are recorded as **High**, **Medium**, **Low** or **Barely Perceptible** guided by **Table 9.5.9: Magnitude of Visual Change**, based on combining professional judgements on size and scale, geographical extent, duration and reversibility.

Table 9.5.9: Magnitude of Visual Change

	Higher	← →	Lower
Scale	A larger visual change resulting from the proposed development becoming a notable aspect of the view, perhaps as a result of the development being in close proximity, or because a substantial part of the view is affected, or because the development introduces a new focal point and/or provides contrast with the existing view and/or changes the scenic qualities of the view.	← →	A smaller visual change resulting from the proposed development becoming a minor or generally unnoticed aspect of the view, perhaps as a result of the development being in the distance, or because only a small part of the view is affected, and/or because the development does not introduce a new focal point or is in contrast with the existing view and/ does not change the scenic qualities of the view.
Geographical Extent	The assessment location is clearly representative of similar visual effects over an extensive geographic area.	← →	The assessment location clearly represents a small geographic area.
Duration	Visual change experienced over around 5 years or more.	← →	Visual change experienced over a short period of up to 5 years.
Reversibility	A permanent visual change which is not reversible or only partially reversible following decommissioning of the proposed development.	← →	A temporary visual change which is largely reversible following the completion of construction, or decommissioning of the proposed development.

6.4 Judging the Level of Visual Effect and Significance

6.4.1 As for landscape effects, the final step in the assessment requires the judgements on sensitivity of visual receptors and magnitude of visual change to be combined to make an informed professional assessment on the significance of each visual effect.

6.4.2 As for landscape effects, a numerical scoring or rigid matrix-type approach is not used. Instead, professional judgement is used to determine the level of effect on a case by case basis (see **Section 5.4**). Judgements are guided by the principles set out in **Diagram 9.5.1: Judging levels of effect - Landscape or Visual (including cumulative)** and the example descriptions/definitions detailed in **Table 9.5.10: Level and Significance of Visual Effects**.

6.4.3 Levels of effect are identified as **Negligible**, **Minor**, **Moderate** or **Major** as set out in **Table 9.5.10: Level and Significance of Visual Effects**, where **Moderate** and **Major** effects are considered **Significant** in the context of the EIA Regulations.

Table 9.5.10: Level and Significance of Visual Effects

Level and Significance of Visual Effect	Indicative Description
Major (Significant)	The proposed development would result in an obvious change in view, likely affecting a visual receptor with a moderate or high susceptibility to that type of change. This level of effect may also occur when a medium scale of effect acts on a nationally valued view and/ or a high susceptibility receptor. The effect is likely to be long-term and affect a relatively large area or relatively large number of people.
Moderate (Significant)	The proposed development would result in a noticeable change in a view, likely affecting a viewer with a moderate susceptibility to that type of change and/ or locally valued view. This level of effect may also occur when a smaller scale of change acts on a higher susceptibility receptor or affects a large number of people, or a larger scale of effect acting on a lower susceptibility receptor or affecting fewer people.

Level and Significance of Visual Effect	Indicative Description
	This level of effect may also occur when a large scale of effect occurs over a relatively short period or over a small area/ affects few people.
Minor (Not Significant)	The proposed development would result in a small change in view over a long-term duration, likely affecting a smaller geographic extent and/ or fewer people. This level of effect may also occur when a larger scale of effect is of short-term duration or is confined in its geographical extent.
Negligible (Not Significant)	The proposed development would not result in a noticeable (barely perceptible) change in views.

7. CUMULATIVE LANDSCAPE AND VISUAL IMPACT ASSESSMENT

7.1 Introduction

7.1.1 The aim of the cumulative assessment is to identify any interactions with other types of development (including transmission infrastructure, wind farms or other large-scale development) which could result in further Significant landscape and visual effects not identified within the LVIA.

7.1.2 A cumulative assessment considers the potential interactions between different types of development (including wind farms, other energy generation stations or other large-scale development) if these are likely to result in similar landscape and visual impacts. The assessment of cumulative landscape and visual effects focuses on changes which may result from the introduction of the Proposed Development in-combination and in-addition to the following:

- other project-related SSEN Transmission developments, referred to as 'Intra' Developments; and
- other SSEN Transmission developments and third party developments (developments not associated with SSEN Transmission), referred to as 'Inter' Developments.

7.1.3 The cumulative assessment deals with cumulative construction and operational effects separately.

7.2 Differences between LVIA and the cumulative assessment

7.2.1 Although both the LVIA and the cumulative assessment look at the effects of the Proposed Development on the landscape and on views, there are differences in the baseline against which the assessments are carried out.

7.2.2 For the LVIA, the baseline includes existing developments (including transmission infrastructure, wind farms and other large-scale development) which are present in the landscape at the time of undertaking the assessment, which may be either operational or under construction, and as such they are assumed to form a part of the baseline situation. Their presence has the potential to influence the assessment of effects on landscape (including its character) and the assessment of effects on views.

7.2.3 For the cumulative assessment the baseline is partially speculative. Other proposed developments within the study area that are reasonably foreseeable to the Applicant are considered within the assessment of potential future cumulative effects, as they may give rise to different potential future cumulative baseline scenarios. Reasonably foreseeable projects include:

- those with planning consent (including Section 36 and Section 37 Consent) but where construction had not commenced at the time of the assessment;
- those with valid planning applications (including Section 36 and Section 37 applications); and
- other projects which have not been submitted into the planning system, but where sufficient information is available to inform a cumulative assessment.

7.2.4 The developments considered within the cumulative assessment are listed in **Table 9.4.1: Intra and Inter Developments considered in the Cumulative LVIA** within **Volume 5, Appendix 9.4: Cumulative Landscape and Visual Assessment**. These developments are shown on **Volume 3, Figures 5.1.1 to 5.1.6: Cumulative Developments.**

7.2.5 Operational and under construction developments form part of the baseline for the LVIA and therefore inform the 'primary' LVIA assessment, which assesses the relationship between the Proposed Development and existing infrastructure as part of the landscape. The cumulative assessment considers both the in-combination and additional cumulative effects of the Proposed Development that would arise in association with other planned developments, and assesses the relationship between them.

7.3 Types of Cumulative Effects

7.3.1 Assessing the Cumulative Impact of Onshore Wind Energy Developments states that "*cumulative landscape effects can change either the physical fabric or character of the landscape, or any special values attached to it*" (NatureScot, 2021).

7.3.2 Cumulative effects on the landscape are considered in terms of the amount of development within a landscape receptor. For cumulative effects on visual amenity, three specific types of effect are considered in the assessment: combined, successive and sequential:

- **combined effects** occur where a static viewer is able to view two or more developments from a viewpoint within the viewers' same arc of vision (assumed to be about 90 degrees for the purpose of the assessment);
- **successive effects** occur where a static viewer is able to view two or more developments from a viewpoint, but needs to turn to see them; and
- **sequential effects** occur when a viewer is moving through the landscape from one area to another, for instance when a person is travelling along a road or footpath and is able to see two or more developments at the same, or at different times as they pass along the route. Frequently sequential effects occur where developments appear regularly, with short time lapses between points of visibility. Occasionally sequential effects occur where long periods of time lapse between views of developments, depending on speed of travel and distance between viewpoints.

7.3.3 GLVIA3 draws a distinction between the "***additional*** *effects of the main project under consideration*" and the "***combined*** *effects of all the past, present and future proposals together with the new project*" (paragraph 7.18, emphasis in original). The Landscape Institute has published clarifications on GLVIA3 which notes that: "*Typically, a 'combined' cumulative assessment would consider the addition of all unbuilt schemes, including the proposed development, to the existing baseline (rather than the combined effect of all past, present, and future schemes against a 'bare landscape')*".

7.3.4 This cumulative assessment focuses on the combined or in-combination cumulative effects of each Intra and Inter Development with the Proposed Development, as well as the in-combination cumulative effects of the Proposed Development and all the Intra and Inter Developments. The additional cumulative effects, ie the contribution of the Proposed Development to the in-combination effect, is highlighted.

7.4 Assessing Cumulative Effects

Cumulative Assessment Methodology

7.4.1 The methodology for the cumulative assessment follows that of the LVIA, which considers the introduction of a proposed development to a baseline which includes existing (operational and under construction) developments. Considerations that inform the assessment include:

- the number of existing, consented and/or proposed developments;
- the pattern and arrangement of developments in the landscape or view, eg developments seen in one direction or part of the view (combined views), or seen in different directions (successive views in which the viewer must turn) or developments seen sequentially along a route;
- the relationship between the scale of the developments (similar scale developments or scales of development which are clearly at odds with each other);
- the position of the developments in the landscape, eg in similar landscape or topographical context;
- the position of the developments in the view, eg on the skyline or against the backdrop of land; or how the proposed development would be seen in association with another development (separate, together, behind etc); and
- the distances between developments, and their distances from the viewer.

Study Area

7.4.2 Developments considered in the cumulative assessment include all reasonably foreseeable developments within 3 km of the Proposed Alignment. In addition, for the purposes of LVIA, projects including tall infrastructure (ie wind farms and OHLs) have been included where these would be within 5 km of the Proposed Alignment. Cumulative landscape and visual effects are assessed separately for each Section (A-F) of the Proposed Development.

Significance of Cumulative Effects

7.4.3 The assessment of significance of cumulative landscape and visual effects follows the same principles as the main LVIA, as set out in **Sections 4-6** above.

7.4.4 The cumulative assessment considers the significant effects of the Proposed Development as set out in the LVIA, and the likely Significant effects of each of the cumulative developments, drawing on published assessments, or based on a high level assessment by the authors (noting that no detailed assessment of the effects of other projects has been undertaken). It considers whether the Proposed Development alongside each of the cumulative developments would result in cumulative

landscape and visual effects which are judged to be significant. Overall assessments of the cumulative effects of the Proposed Development with each group of cumulative developments are also included, as well as a judgement on the contribution (additional cumulative effect) of the Proposed Development to these cumulative effects.

7.4.5 GLVIA 3 states *'The most significant cumulative landscape effects are likely to be those that would give rise to changes in the landscape character of the study area of such an extent as to have major effects on its key characteristics and even, in some cases, to transform it into a different landscape type. This may be the case where the project being considered itself tips the balance through its additional effects. The emphasis must always remain on the main project being assessed and how or whether it adds to or combines with the others being considered to create a significant cumulative effect'* (paragraph 7.28, page 129).

7.4.6 Significant landscape effects are likely where:

- a proposed development extends or intensifies a landscape effect;
- a proposed development 'fills' an area such that it alters the landscape resource; and/or
- the interaction between a proposed development and other developments means that the total effect on the landscape is greater than the sum of its parts.

7.4.7 Significant visual effects are likely where:

- a proposed development extends or intensifies a visual effect;
- a proposed development 'fills' an area such that it alters the view/visual amenity;
- the interaction between a proposed development and other developments means that the total visual effect is greater than the sum of its parts; and/or
- a proposed development would lengthen the time over which effects are experienced (sequential effects).

7.4.8 This determination of cumulative landscape and visual effects requires the application of professional judgement and experience to take on board the many different variables which need to be considered, and which are given different weight according to site-specific and location-specific considerations in every instance. Judgements are made on a case-by-case basis, guided by **Diagram 9.5.1: Judging levels of effect - Landscape or Visual (including cumulative)**, and with reference to the indicative descriptions set out in **Table 9.5.5: Level and Significance of Landscape Effects** for landscape effects and **Table 9.5.10: Level and Significance of Visual Effects** for visual effects.

8. ZONE OF THEORETICAL VISIBILITY PRODUCTION

8.1 Introduction

8.1.1 Evaluation of the theoretical extent to which the Proposed Development is visible across the study area is undertaken by establishing a Zone of Theoretical Visibility (ZTV). The ZTV is a map or series of maps generated within a Geographical Information System (GIS) model which presents a visual interpretation of the predicted visibility of the development from locations within the geographic extent of the plans generated. The model relates the vertical height of the development with baseline topographic model data to calculate likely visibility. The maps overlay a horizontal plan of the Proposed Development with a series of coloured polygons (areas) which indicate whether, and to what extent, the development is visible close to ground level from receptors located in each area.

8.1.2 The ZTV has been prepared based on the location and the heights of the towers, as described in **Volume 1, Chapter 3: Project Description**, and shown on **Volume 3, Figure 3.1.1 to 3.1.29: Proposed Development for which Section 37 Consent (*Electricity Act, 1989*) is sought**.

8.2 Bare Earth ZTV

8.2.1 The ZTV has been prepared based on a 'bare earth' computer generated digital terrain model (DTM) which does not take account of potential screening by buildings, woodland, vegetation or other surface features. The bare earth ZTV was calculated using ArcGIS Pro 3.3.1 software.

8.2.2 The bare earth DTM is comprised of OS Terrain® 5 (5 m resolution) data across the 5 km study area. It should be noted that the software uses raster height data, but while it is defined as continuous data (with each grid square referred to as a 'cell'), it assumes a single height value from the centre of that cell for the whole cell. Therefore, any height variations between centre points of cells would not be recognised.

8.2.3 The DTM data has not been altered (ie by the addition of local surface screening features) for the production of the bare earth ZTV. No significant discrepancies have been identified between the DTM used and the actual topography around the study area. The effect of earth curvature and light refraction has been included in the bare earth ZTV analysis and a viewer height of 2 m above ground level has been used. A maximum visibility distance was set to 10 km from each tower. The following points should also be noted:

- there are limitations in the use and reliance on this theoretical visibility, and these should be considered in the interpretation and use of the ZTV;
- the ZTV uses a bare earth DTM model, and does not consider the screening effects of vegetation, buildings, or other local features that may prevent or reduce visibility;
- the ZTV is considered to over emphasise the extent of visibility of the proposed overhead transmission infrastructure and therefore represents a 'maximum potential visibility' scenario; and
- there is often a wide range of variation within the visibility illustrated by a ZTV, for example, an area shown as having visibility of a larger number of proposed steel lattice towers may in reality only experience views of a small proportion of the structures, which can make a considerable difference in the potential effects of the Proposed Development on receptors within the area affected by visibility.

8.2.4 In light of these limitations, whilst ZTVs are used as a starting point to inform the assessment, providing an indication of where the Proposed Development would theoretically be visible, the information drawn from the ZTV was verified with reference to computer generated wireline images of the Proposed Development, to ensure that the assessment conclusions represent the visibility of the Proposed Development reasonably accurately.

9. PHOTOGRAPHY AND PHOTOMONTAGE

9.1 Viewpoint photography

9.1.1 Viewpoint photography was undertaken from 38 representative viewpoint locations to capture the existing baseline view in compliance with Landscape Institute Technical Guidance Note (TGN) 06/19 - Visual Representation of Development Proposals (The Landscape Institute, 2019). Photography was undertaken by LUC from December 2023 and February 2025.

9.1.2 A series of overlapping photographs to an extent of 360 degrees were taken with either a Nikon D750 or D600 Full Frame digital SLR camera, with a fixed 50 mm focal length lens using a fully levelled tripod with Manfrotto panoramic head.

9.1.3 A tripod with vertical and horizontal spirit levels was used to provide stability and to ensure a level set of adjoining images. A panoramic head was used to ensure the camera rotated about the no-parallax point of the lens to eliminate parallax errors between the successive images and enable accurate stitching of the images. The camera was moved through increments of 15 degrees and rotated through a full 360 degrees at each viewpoint. 24 photographs were taken for each 360-degree view.

9.1.4 The location of each viewpoint was recorded (GPS grid reference, location map and photograph of the tripod) in accordance with NatureScot and Landscape Institute guidance.

9.1.5 Weather conditions and visibility were considered an important aspect of the field visits for the photography. Where possible, visits were planned around clear days with good visibility. Viewpoint locations were visited at times of day to ensure, as far as possible, that the sun lit the scene from behind, or to one side of the photographer. Photography opportunities facing into the sun were avoided where possible.

9.2 Photography Stitching

9.2.1 Photography stitching software (PTGui© version 12.24) was used to stitch together the adjoining images to form panoramic images in cylindrical projection. A selection of identical control points was created within each of the adjoining frames to increase the level of accuracy when stitching the 360° panoramic photography.

9.3 Photomontage and Wireline Visualisations

9.3.1 The 3D model of the Proposed Development was provided in Revit and DXF formats (provided May 2025). The models contained the Proposed Development, including tower locations.

9.3.2 Software packages Autodesk 3DS Max© and Blender version 4.2.0.0 were used to view the Proposed Development from the selected viewpoints. 3DS Max was used as the primary modelling and render software. Blender (using the GIS add on) was used to manage, convert and render terrain models.

9.3.3 OS Terrain 5 Digital Terrain Model was used to obtain accurate z value heights for all viewpoint locations. This data has a vertical accuracy of +/-2.5m. This data provided a detailed and reliable representation of the topography for the model views.

9.3.4 The DTM was imported into Blender using the GIS Add on and exported as an FBX for use within the 3DS Max model to render only parts of the Proposed Development and OHL model that weren't obscured from view by terrain.

9.3.5 The viewpoint locations were then added to the 3DS Max environment model using the on-site photography GPS coordinate positions, cross-referenced and microsited with high-resolution aerial photography. The model views were created to replicate the camera lens parameters and perspective geometry of the baseline photography. Exposure settings (Aperture, ISO and Shutter speed) contained within the metadata of each photograph was also matched to the model cameras. The DTM renders provided an accurate guide for skewing the baseline photography to match the 3D terrain.

9.3.6 Viewer height was set to 1.5 m above ground level. On limited occasions this viewer height was increased by a small increment to achieve a closer match between the terrain data and photographic landform content.

9.3.7 Control points, including existing OHL towers, buildings and other notable landmarks, identified in high-resolution aerial photography were used to aid alignment of the model and photographic views, along with the rendered terrain model.

9.3.8 90° sections of the baseline photographs were linked as a background to each model view which allowed accurate horizontal and vertical alignment of the Proposed Development within the view.

9.3.9 The presentation of fully rendered photomontages involved additional stages as follows:

- 3DS Max software was used to render the towers and associated infrastructure. A daylight system was created in the 3D model view with lighting strength and direction applied to closely represent the conditions present at the date and time when each photograph was taken.
- The next stage required the 3D model views to be rendered, composited and aligned with the baseline photography using Adobe Photoshop© software and allowed, where relevant, for infrastructure or parts of infrastructure to be masked (removed) where they were located behind foreground elements that appeared in the original photograph.
- Adobe InDesign© software was used to present the figures. The dimensions for each image (printed height and field of view) are in accordance with NatureScot requirements. Photography information and viewing instructions are provided on each page.
- All viewpoints have been presented as separate images with a cylindrically projected 90° horizontal field of view (FOV).
- Where visibility of the Proposed Development was limited, or completely obscured, an additional page presenting a photowire/wireline overlay of the towers and OHL has been included. This overlay represents the development as it would be seen if obscured by landform only, discounting any vegetation or other development.
- Access tracks and felling are included in selected, key views, and were calculated using rendered footprints from the 3D model, montaged into the baseline photographs. Viewpoints including these elements have been titled to highlight their inclusion.

9.3.10 The elongated A1 width format pages (841 x 297 mm) presented for each viewpoint are set out as follows (noting that not all pages are required for each viewpoint, with an explanation of why included):

- Baseline Photograph - 90˚ baseline photography to illustrate the wider landscape and visual context. These are shown in cylindrical projection and presented on an A1 width page. Additional pages in the same format are provided where relevant to illustrate wider visibility up to 360˚. An inset basemap with Ordnance Survey 1:50,000 scale basemapping shows viewpoint location the 90˚ view direction, and position of towers.
- Photomontage at Year 0 - 90˚ montage at Type 4/AVR2 level of detail.[18] The photomontage matches the same formatting as the baseline photograph above, with fully rendered models representing the Proposed Development.
- Photomontage at Year 0 with cumulative wireline overlay - 90˚ montage at Type 4/AVR2 level of detail. The photomontage matches the same formatting as photomontage, and includes coloured overlay for cumulative routes. This page is presented on selected key views surrounding cumulative substation proposals.
- Photowire - 90˚ montage wireline overlay. Where visibility of the Proposed Development was limited, or completely obscured, an additional page presenting a photowire/wireline overlay of the towers and OHL has been included. This overlay represents the development as it would be seen if obscured by landform only, discounting any vegetation or other development.
- Vertical LOD – For viewpoints where towers are close enough for the LOD to make a discernible difference, an additional page has been presented indicating a pink solid line above each tower, demonstrating an increase of 9 m in height.

[18] Type 4 visualisation defined as a scale-verifiable photomontage in Landscape Institute TGN 06/19. Accurate Visual Representation (AVR) Level 2 shows the location, scale, massing and architectural form of development proposals.