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Appendix 6.1

Landscape and Visual Impact Assessment (LVIA) Methodology

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Glossary

Term	Definition
Baseline studies	*'Work done to determine and describe the environmental conditions against which future changes can be measure or predicted and assessed'*
Characteristics	*'Elements or combinations of elements, which make a contribution to distinctive landscape character.'**
Compensation	*'Measures devised to offset or compensate for residual adverse effects which cannot be prevented/avoided or further reduced.'**
Cumulative Landscape & Visual Impact Assessment (CLVIA)	To identify, predict and evaluate potential key effects arising from the addition of the Proposed Development to a theoretical baseline which includes the existing baseline situation of operational wind farms, those under construction and additionally wind farms currently being considered within the planning system that may or may not be present in the landscape in the future.
Direct effect	*'An effect that is directly attributable to the proposed development.'**
'Do nothing' situation	*'Continued change or evolution in the landscape in the absence of the proposed development.'**
Enhancement	*'Proposals that seek to improve the landscape resource and the visual amenity of the proposed development site and its wider setting, over and above it's baseline condition.'**
Environmental Impact Assessment (EIA)	*Environmental Impact Assessment (EIA) is a means of drawing together by the developer, in a systematic way, a description of the development and information relating to an assessment of the likely significant environmental effects arising from a Proposed Development*
Environmental Impact Assessment Report (EIAR)	A document reporting the findings of the EIA and produced in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 Regulation 5
Geographical Information System (GIS)	*'A system that captures, stores, analyses, manages and presents data linked to location. It links spatial information to a digital database.'**
Indirect effects	*'Indirect 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.'**
Iterative design process	*'The process by which project design is amended and improved by successive stages of refinement which respond to growing understanding of environmental issues'**
Key characteristics	*'Those combinations of elements which are particularly important to the current character of the landscape and help to give an area its particularly distinctive sense of place'**
Landcover	*' The surface cover of the land, usually expressed in terms of vegetation cover or lack of it. Related to but not the same as land use.'**
Land Use	*'What land is used for, based on broad categories of functional land cover, such as urban and industrial use and the different types of agriculture and forestry.'**
Landform	*'The shape and form of the land surface which has resulted from combinations of geology, geomorphology, slope, elevation and physical processes.'**
Landscape	*'An area, as perceived by people, the character of which is the result of the action and interaction of natural and/or human factors.'**
Landscape & Visual Impact Assessment (LVIA	*'A tool used to identify and assess the likely significance of the effects of change resulting from development both on the landscape as an environmental resource in its own right and on people's views and visual amenity.'**
Landscape character	*'A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.'**
Landscape Character Areas (LCAs)	*'A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.'**
Landscape Character Assessment (LCA)	*'The process of identifying and describing variation in the character of the landscape, and using this information to assist in managing change in the landscape. It seeks to identify and explain the unique combination of elements and features that make landscape distinctive. The process results in the production of a Landscape Character Assessment.'**
Landscape Character Types	*'These are distinct types of landscape that are relatively homogeneous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur they share broadly similar combinations of geology, topography, drainage patterns, vegetation and historical land use and settlement pattern, and perceptual and aesthetic attributes.'**
Landscape effects	*'Effects on the landscape as a resource in its own right.'**
Landscape quality (condition)	*'A measure of the physical state of the landscape. It may include the extent to which typical character is represented in individual areas, the intactness of the landscape and the condition of individual elements.'**
Landscape receptors	*'Defined aspects of the landscape resource that have the potential to be affected by a proposal'**
Landscape value	*'The relative value that is attached to different landscapes by society. A landscape may be valued by different stakeholders for a whole variety of reasons.'**
Magnitude (of effect)	*'A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is reversible or irreversible and whether it is short or long term in duration.'**
Panorama	*'An image covering a horizontal field of view wider than a single 50mm frame. Wirelines and photomontages may also be produced as panoramas.'***
Perception	*'Combines the sensory (that we receive through our senses) with the cognitive (our knowledge and understanding gained from many sources an experiences).'**
Photomontage	*'A visualisation which superimposes an image of a proposed development upon a photograph or series of photographs'**

Term	Definition
Protected and designated landscapes	*'Areas of landscape identified as being of importance at international, national or local levels, either defined by statute or identified in development plans or other documents.'**
Receptors	*'See Landscape receptors and Visual receptors.'**
Scoping	*'The process of identifying the issues to be addressed by an EIA. It is a method of ensuring that an EIA focuses on the important issues and avoids those that are considered to be less significant.'**
Sensitivity	*'A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor.'**
Significance	*'A measure of the importance or gravity of the environmental effect, defined by significance criteria specific to environmental topic'**
Susceptibility	*'The ability of a defined landscape or visual receptor to accommodate the specific proposed development without undue negative consequences.'**
The Applicant	Fred. Olsen Renewables Ltd
The Proposed Development	The proposed Scawd Law Wind Farm development
The Proposed Development Area	The development area within the red line site boundary (application area) as shown in Volume 3a Figure 1.2: Site Layout.
Developer	In the event of the Proposed Development being granted Section 36 Consent, this is the Company developing the Project
Tranquillity	'*A state of calm and quietude associated with peace, considered to be a significant asset of landscape.*'*
Visual amenity	'*The overall pleasantness of the views people enjoy of their surroundings, which provides an attractive visual setting or backdrop for the enjoyment of activities of the people living, working, recreating, visiting or travelling through an area.'**
Visual effects	'*Effects on specific views and on the general visual amenity experienced by people.'**
Visual receptors	*'Individuals and/or defined groups of people who have the potential to be affected by a proposal.'**
Visualisation	'*A computer simulation, photomontage or other technique illustrating the predicted appearance of a development.'**
Wirelines	*These are also known as wireframes and computer generated line drawings. These are line diagrams that are based on DTM data and illustrate the three-dimensional shape of the landscape in combination with additional elements such as the components of a proposed wind farm.'***
Zone of Theoretical Visibility (ZTV)	*'A map, usually digitally produced, showing areas of land within which a development is theoretically visible.'**

*Taken from Guidelines for Landscape and Visual Impact Assessment, Third Edition. 2013
** Taken from Visual Representation of Wind Farms, Guidance. 2017

List of Abbreviations

List and describe your abbreviations here.

Abbreviation	Description
AGL	Above Ground Level
CLVIA	Cumulative Landscape & Visual Impact Assessment
DSLR	Digital Single Lens Reflex
DTM	Digital Terrain Model
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
ELC	European Landscape Convention
EOS	Electro-Optical System
FoV	Field of View
GLVIA3	Guidelines for Landscape and Visual Impact Assessment, Third Edition
HES	Historic Environment Scotland
km	Kilometre
LCT	Landscape Character Type
LVIA	Landscape & Visual Impact Assessment
m	Metre
OS	Ordnance Survey
PLI	Public Local Inquiry
SNH	Scottish Natural Heritage (now NatureScot)
ZTV	Zone of Theoretical Visibility

A6.1 INTRODUCTION

A6.1.1 This Appendix sets out in detail the methodology that has been applied to undertake the Landscape and Visual Impact Assessment (LVIA). The aim of this LVIA is to identify, predict and evaluate potential effects arising from the addition of Scawd Law Wind Farm (the Proposed Development) on landscape and visual amenity. The *Guidelines for Landscape and Visual Impact Assessment, Third Edition* (GLVIA3)[1] describes LVIA as:

'Landscape and Visual Impact Assessment is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right and people's views and visual amenity.' (GLVIA3, paragraph 1.1).

Definition of Landscape & Visual Amenity

A6.1.2 Although closely related, landscape and visual amenity are considered separately in this LVIA in accordance with best practice and are distinguished as follows:

- **Landscape**: Is defined by the European Landscape Convention (ELC) as '*an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.*'[2] Factors contributing to landscape character include the interaction of both natural (geology, soils, climate, flora, and fauna) and cultural (historical and current impacts of land use, settlement, enclosure, and other human interventions), which are perceived by people; and
- **Visual Amenity**: Relates to the views people have, and their visual amenity *'meaning the overall pleasantness of the views they enjoy of their surroundings.'*(GLVIA3, Para 2.20)

Landscape & Visual Effects

A6.1.3 The methodologies that are used to assess the potential effects on landscape and visual amenity are broadly similar but set out separately in this Appendix to distinguish the differences between the two.

A6.1.4 Landscape and visual effects are defined in GLVIA3 as follows:

- Landscape effects: '***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.* (GLVIA3, Para 5.1); and
- Visual effects: '***An assessment of visual effects deals with the effects of change and development on the views available to people and their visual amenity***. *The concern here is with assessing how the surroundings of individuals or groups of people may specifically be affected by the changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements.*' (GLVIA3, Para 6.1).

A6.1.5 In addition, this LVIA also considers the cumulative effect of the Proposed Development on the landscape and visual resource. In this LVIA, cumulative effects are defined 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.' (Scottish Natural Heritage (SNH), 2012: 4).[3]

A6.1.6 The SNH guidance also defines the difference between landscape and visual cumulative effects as follows:

- **Cumulative landscape effects**: *'can impact on either the physical fabric or character of the landscape, or any special values attached to it'* (SNH, 2012: 11); and
- **Cumulative visual effects**: *'occurs where the observer is able to see two or more developments from one viewpoint*' resulting in combined visibility or *'occur when the observer has to move to another viewpoint to see different developments'* (SNH, 20212: 11).

A6.1.7 As a precautionary approach, potential effects on landscape character and visual amenity are considered in this LVIA to be adverse but it should be noted that not all people would experience effects on landscape character, views, and visual amenity as adverse, as people's perception of wind turbines vary between positive and negative attitudes. An additional point is that simply because wind turbines are visible from a particular location or receptor, this does not mean that the effect is significant. In some instances, there may be likely significant effects on the landscape resource, but the Proposed Development may be in a location that does not affect visual amenity in a significant way. It is also possible that there may be likely significant effects on visual amenity without effects on the landscape resource.

Key Stages of the LVIA

A6.1.8 GLVIA3 sets out the steps for undertaking the assessing of landscape effects (GLVIA3, Figure 5.1) and visual effects (GLVIA3, Figure 6.1) as follows:

[1] Landscape Institute, Institute of Environmental Management. (2013) *Guidelines for Landscape and Visual Impact Assessment, Third Edition*. Abingdon. Routledge

[2] Council of Europe. Council of Europe Landscape Convention (2000) European Landscape Convention. Strasbourg: Council of Europe.

[3] Scottish Natural Heritage (2012) Assessing the Cumulative Impact of Onshore Developments [Online] https://www.nature.scot/doc/assessing-impacts-wild-land-areas-technical-guidance (Accessed November 2022)

Diagram A6.1: Assessment of landscape effects

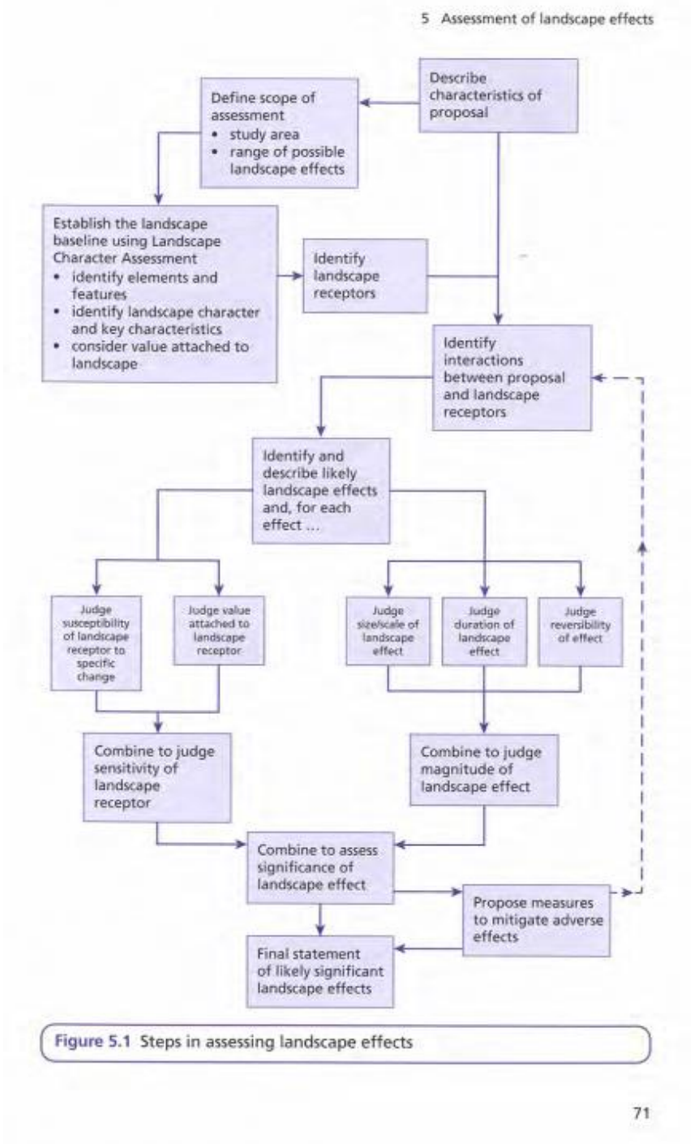
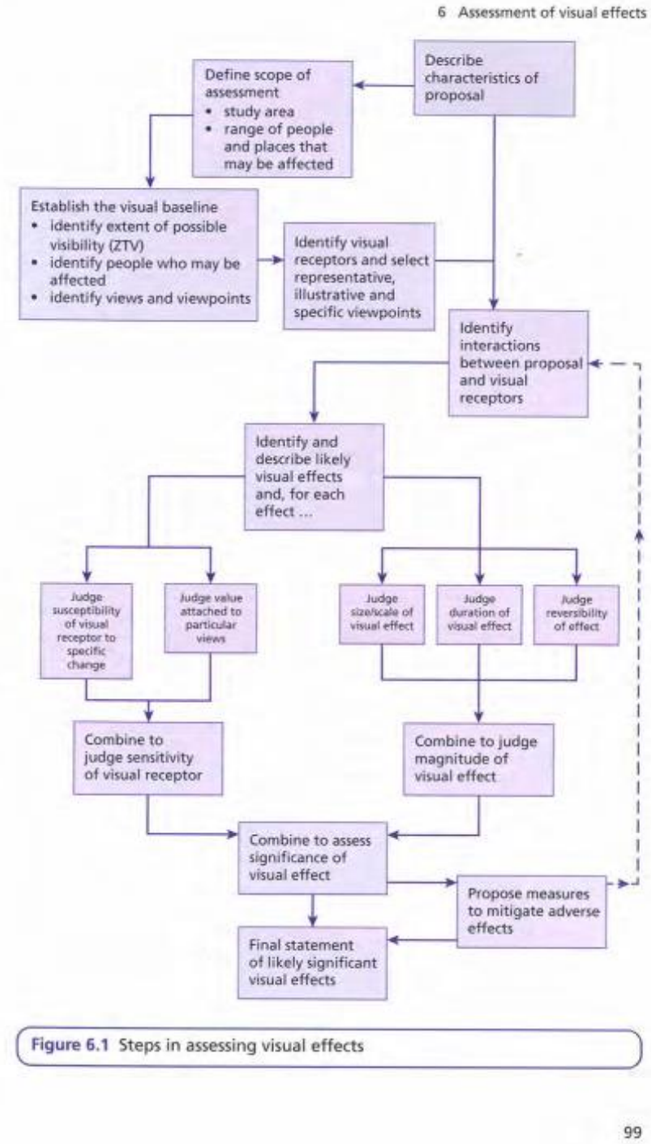


Diagram A6.2 Assessment of visual effects



A6.1.9 Each of the above steps is interchangeable throughout the assessment process as the design of the Proposed Development evolves and further information becomes available during the Environmental Impact Assessment (EIA).

A6.2 ASSESSMENT GUIDANCE

A6.2.1 This LVIA has been prepared in accordance with the principles set out in GLVIA3. In addition to this, the LVIA takes account of the following guidance documents:

- *GLVIA3 Statement of Clarification 1/13 10-06-13* (Landscape Institute, 2013);[4]
- *Siting and Designing Wind Farms in the Landscape, Guidance, Version 3a* (SNH, August 2017);[5]
- *Environmental Impact Assessment Handbook: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland. (SNH, Historic Environment Scotland, April 2018)*[6] *;*
- *General pre-application and scoping advice for onshore wind farms, Guidance* (NatureScot, October 2020);[7]
- *Landscape Character Assessment, Guidance for England and Scotland*, (The Countryside Agency and Scottish Natural Heritage (SNH) 2002 Edition);[8]
- *Landscape Sensitivity Assessment Guidance,* (NatureScot, April 2022);[9]
- *Technical Guidance Note 02/21, Assessing landscape value outside national designations* (Landscape Institute, February 2021);[10]
- *Technical Information Note 01/2017 (Revised), Tranquillity – An overview (Landscape Institute, 2017);*[11]
- *Assessing impacts on Wild Land Areas – Technical Guidance* (NatureScot, Sep 2020);[12]
- *Assessing the Cumulative Impact of Onshore Developments* (SNH, 2012)[13];
- *Guidance Note 01/20 Guidance note for the reduction of obtrusive light* (Institution of Lighting Professionals, 2020);[14]
- *Technical Guidance Note 2/19, Residential Visual Amenity Assessment (RVAA)* (Landscape Institute, 2019);[15]
- *Visual Representation of Wind Farms, Version 2.2,* (SNH, February 2017);[16] and
- *Technical Guidance Note 06/19, Visual Representation of Development Proposals (*Landscape Institute, 2019);[17]

A6.3 STUDY AREA & IDENTIFICATION OF RECEPTORS

LVIA Study Area

A6.3.1 The first step of the LVIA is to establish the extent of study area. NatureScot guidance (2017),[18] advises for turbines in excess of 150 m in tip height, a 45 km study area is recommended. This has been offset from the outermost turbines of the Proposed Development.

Cumulative Study Area

A6.3.2 For the cumulative assessment, an initial study area of 60 km is identified in accordance with the relevant guidance (SNH, 2012).[19] Following a review, this has been refined to 45 km from the outermost turbines and data collected for sites that are consented and submitted applications which would likely be experienced in conjunction with the Proposed Development.

A6.3.3 It should be noted that the study areas applied in this LVIA have been determined as areas where all potential significant landscape and visual effects are likely to occur and is not the limit of potential visibility of the Proposed Development.

Identification of Landscape and Visual Receptors

A6.3.4 Once the study area has been defined, the next step is to establish how the Proposed Development may give rise to landscape and visual effects. This is established through an understanding of the project components proposed, their layout and evolution through construction, operational and decommissioning phases. This forms the basis of the assessment and aids the identification of the landscape and visual baseline likely to be affected, referred to as landscape and visual receptors.

A6.3.5 These were identified through analysis of Zone of Theoretical Visibility (ZTV) mapping (described in Section A6.8), desk-study and field work.

[4] Landscape Institute (2013) GLVIA3 Statement of Clarification 1/13 10-06-13 [Online] Available from https://www.landscapeinstitute.org/technical/glvia3-panel/glvia3-clarifications/ (Accessed November 2022)

[5] Scottish Natural Heritage (2017) Siting and Designing Wind Farms in the Landscape, Guidance. [Online] https://www.nature.scot/sites/default/files/2017-11/Siting%20and%20designing%20windfarms%20in%20the%20landscape%20-%20version%203a.pdf (Accessed November 2022)

[6] Scottish Natural Heritage., Historic Environment Scotland (2018) Environmental Impact Assessment Handbook [Online] https://www.nature.scot/sites/default/files/2018-05/Publication%202018%20-%20Environmental%20Impact%20Assessment%20Handbook%20V5.pdf (Accessed November 2022)

[7] Scottish Natural Heritage (2020) General pre-application and scoping advice for onshore wind farms [Online] https://www.nature.scot/doc/general-pre-application-and-scoping-advice-onshore-wind-farms (Accessed November 2022)

[8] Land Use Consultants., Swanwick. C. (2002) Landscape Character Assessment Guidance for England and Scotland. The Countryside Agency, Scottish Natural Heritage. Cheltenham.

[9] NatureScot (2020) Landscape Sensitivity Assessment Guidance [Online] https://www.nature.scot/doc/landscape-sensitivity-assessment-guidance-methodology (Accessed November 2022)

[10] Landscape Institute (2021) Technical Guidance Note 02/21 Assessing landscape value outside national designations. [Online] https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2021/05/tgn-02-21-assessing-landscape-value-outside-national-designations.pdf (Accessed November 2022)

[11] Landscape Institute (2017) Technical Information Note 01/2017 (Revised) Tranquillity – An overview. [Online] https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2017/02/Tranquillity-An-Overview-1-DH.pdf (Accessed November 2021)

[12] NatureScot (2020) Assessing impacts on Wild Land Areas – technical guidance [Online] https://www.nature.scot/doc/assessing-impacts-wild-land-areas-technical-guidance (Accessed November 2022)

[13] Scottish Natural Heritage (2012) Assessing the Cumulative Impact of Onshore Developments [Online] https://www.nature.scot/doc/guidance-assessing-cumulative-landscape-and-visual-impact-onshore-wind-energy-developments (Accessed November 2022)

[15] Landscape Institute (2019) Residential Visual Amenity Assessment (RVAA) [Online] https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/03/tgn-02-2019-rvaa.pdf (Accessed November 2021)

[16] Scottish Natural Heritage (2017) Visual Representation of Wind Farms, Guidance. [Online] https://www.nature.scot/sites/default/files/2019-09/Guidance%20-%20Visual%20representation%20of%20wind%20farms%20-%20Feb%202017.pdf (Accessed November 2022)

[17] Landscape Institute (2019) Technical Guidance Note 06/19 Visual Representation of Development Proposals [Online] https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf (Accessed November 2022)

[18] Scottish Natural Heritage (2017) Visual Representation of Wind Farms, Guidance. [Online] https://www.nature.scot/sites/default/files/2019-09/Guidance%20-%20Visual%20representation%20of%20wind%20farms%20-%20Feb%202017.pdf (Accessed November 2022)

[19] Scottish Natural Heritage (2012) Assessing the Cumulative Impact of Onshore Developments [Online] https://www.nature.scot/doc/assessing-impacts-wild-land-areas-technical-guidance (Accessed November 2022)

A6.4 LANDSCAPE & VISUAL AMENITY BASELINE

A6.4.1 A review of the landscape and visual receptors located within the study area is undertaken through a combination of desk study and site work.

Landscape Baseline

A6.4.2 Landscape is defined by the relationship between people and place and how different components of the natural environment such as geology, soils, climate, flora, and fauna; interact and are perceived alongside cultural and social components of historical and cultural land use, settlement, enclosure, and other human interventions.

A6.4.3 Landscape is made up of individual features which, can be defined at a broad scale, as a distinct, recognisable, and consistent pattern of elements that makes one landscape different from another. In relation to this LVIA, these are recognised as Landscape Character Types (LCTs) which comprise geographical areas of particular combinations of landform, landcover and pattern conveying a sense of place defined at a scale of 1:50,000 and include a list of key characteristics.

A6.4.4 Designated landscapes at national and local level are also included as broad scale landscape receptors and include the special qualities which contributed to their reasons for designation.

A6.4.5 The landscape baseline has been identified through review of the following information:

- Landscape Character Types and Map Descriptions (SNH, 2019);[20]
- Landscape Character Assessment: Borders – Landscape Evolution and Influences (NatureScot, 2019);[21]
- The Borders landscape assessment (SNH, 1998);[22]
- Wind Energy Consultancy, Update of Wind Energy Landscape Capacity and Cumulative Impact Study (Scottish Borders Council, 2016);[23]
- The special qualities of the National Scenic Areas (SNH, 2010);[24]
- Inventory of Gardens and Designed Landscapes (Historic Environment Scotland);[25]
- Wild Land Area Descriptions and Maps (SNH, 2014);[26] and
- Local Landscape Designations (Scottish Borders Council, 2012).[27]

Visual Amenity

A6.4.6 Visual amenity relates to people's views from static locations or when moving through the landscape and are usually grouped by what they are doing such as residents, road users, recreational users, visitors, and workers etc. They include people living and working in the area, people travelling through the area on foot, road, rail or other forms of transport, people visiting promoted tourist attractions and landscapes, and people pursuing other recreational activities.

A6.4.7 The following have been considered in the visual baseline:

- Residential properties within 3 km of the Proposed Development (agreed through consultation with Scottish Borders Council (SBC);
- Settlements;
- Roads including A, B, and minor roads;
- Walking routes including the Southern Upland Way, Cross Borders Way, Scottish Hill Tracks, and Public Rights of Way/Core Paths within 5 km of the Proposed Development;
- Hill tops; and
- Promoted visitor attractions.

Viewpoints

A6.4.8 A selection of viewpoints has been chosen in consultation with the Energy Consents Unit (ECU), NatureScot and SBC to represent the views experienced towards the Proposed Development within the study area by various groups of people.

A6.4.9 Selected viewpoints include representative, specific, and illustrative views from publicly accessible locations, which are defined in GLVIA3 (paragraph 6.19) as:

- *'**Representative viewpoints**: selected to represent the experience of different types of visual receptors, where larger number 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 public footpaths and bridleways;*
- ***Specific viewpoints**: chosen because they are key views and sometimes promoted viewpoints within the landscape, including for example scenic viewpoints from roads, specific local visitor attractions, viewpoints in areas that are particular noteworthy for 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 issue, which might be the restricted visibility at certain locations.'*

A6.4.10 Viewpoints are selected to take account of the viewing experience (such as static views from settlements and sequential views from routes), cumulative views of other developments and as far as possible are representative of the range of key visual receptors and view types (including panoramas, vistas, glimpsed views), as well as being located at varying distances, elevations, and orientations from the Proposed Development.

[20] NatureScot (2019) Landscape Character Types [Online] https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions (Accessed November 2022)

[21] NatureScot (2019) Landscape Character Assessment: Borders – Landscape Evolution [Online] file:///C:/Users/graemegl/Downloads/nature.scot-Landscape%20Character%20Assessment%20Borders%20-%20Landscape%20Evolution%20and%20Influences%20(1).pdf (Accessed November 2022)

[22] ASH Consulting Group (1998) Scottish Natural Heritage Review No. 112 The Borders landscape assessment. Scottish Natural Heritage. Battleby.

[23] Scottish Borders Council (2016) Wind Energy Consultancy Update of Wind Energy Landscape Capacity and Cumulative Impact Study [Online] https://scottishborders.moderngov.co.uk/documents/s14256/Item%20No.%2018%20-%20Part%201%20of%20IF%20REPORT%20Pages%201-42.pdf (Accessed November 2022)

[24] Scottish Natural Heritage (2010) Scottish Natural Heritage Commissioned Report 374: The Special Qualities of the National Scenic Areas. Scottish Natural Heritage. Battleby.

[25] Historic Environment Scotland (2021) Inventory of Gardens and Designed Landscapes. [Online] https://www.historicenvironment.scot/advice-and-support/listing-scheduling-and-designations/gardens-and-designed-landscapes/what-is-the-inventory-of-gardens-and-designed-landscapes/ (Accessed November 2022)

[26] Scottish Natural Heritage (2014) Wild Land Areas map and descriptions. [Online] https://www.nature.scot/doc/wild-land-areas-map-and-descriptions-2014 (Accessed November 2022)

[27] Scottish Borders Council (2012) Planning Guidance – Local Landscape Designations. [Online] https://www.scotborders.gov.uk/directory_record/20043/local_landscape_designations/category/28/approved_planning_guidance (Accessed November 2022)

Night-time Baseline

A6.4.11 Night-time baseline lighting has been informed by *England's Light Pollution and Dark Skies Interactive Map*[28] produced by the Campaign to Protect Rural England (CPRE) which also covers Scotland, and fieldwork from a number of landscape and visual receptor locations.

A6.4.12 Guidance published by the Institute of Lighting Professionals (ILP) has also been considered in this assessment, in particular, two documents:

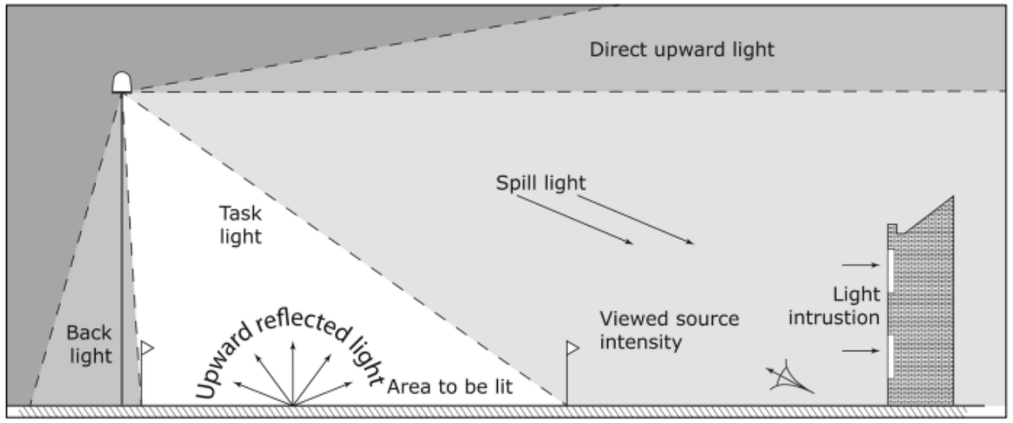
- *Guidance on Undertaking Environmental Lighting Impact Assessments* (Institution of Lighting Professionals, 2013);[29] and
- *Guidance Note 01/21 The Reduction of Obtrusive Light* (Institution of Lighting Professionals, 2021).[30]

A6.4.13 These documents provide useful guidance in the undertaking of night-time assessment as well as providing some context of the different types of light pollution encountered as follows:

*'**Obtrusive light**, whether it keeps you awake through a bedroom window, impedes your view of the night sky or adversely affects the performance of an adjacent lighting installation, is a form of pollution. It may also be a nuisance in law and can be substantially mitigated without detriment to the requirements of the task.*

***Skyglow**, the brightening of the sky, **Glare**, the uncomfortable brightness of a light source when viewed against a darker background, **Light spill** the spilling of light beyond the boundary of the area being lit and **Light intrusion** ('**Nuisance**') are all forms of obtrusive light which may cause nuisance to others, or adversely affect fauna & flora as well as waste money and energy.'* (ILI, 2021)3

Diagram A6.3: Types of obtrusive light (Figure 1 from ILI, 2021)



A6.5 FIELD SURVEY

A6.5.1 Site visits were undertaken periodically between January 2019 and November 2022 during periods of clear visibility and included visits to the Proposed Development Area, and the wider study area from publicly accessible locations in order to aid the assessment.

A6.5.2 Viewpoint photography was undertaken between November 2021 and January 2022 during periods of good visibility.

A6.6 LANDSCAPE AND VISUAL EFFECTS

A6.6.1 The terms 'impact' and 'effect' are distinguished in GLVIA3 as follows:

'impact', defined as the action being taken, and 'effect', defined as the change resulting from that action, and recommends that the terms should be used consistently in this way' (GLVIA3, para, 1.15)

A6.6.2 In this LVIA, potential effects are classified into one or more of the following:

- **Direct effects** to the physical landscape and restricted within the Proposed Development Area that arise from activities that from an integral part of the project. For example, the effects upon landform and vegetation that may be physically altered by the Proposed Development;
- **Indirect** or **Secondary effects** that arise from activities not explicitly forming part of the project or which arise subsequently as a result of an initial effect of the scheme. For example, effects on landscape character from the introduction of new elements that alter the recognisable pattern of elements that occurs consistently in a particular type of landscape;
- **Temporary effects** that persist for a limited period only, due for example to particular construction activities;
- **Medium** to **Long-term effects** which would persist for the foreseeable future, or which would give rise to an irreversible change to the baseline environment;
- **Residual effects** resulting from the scheme once the final design has been adopted and committed mitigation measures have been considered; and
- **Cumulative effects** associated with consented sites and those currently within the planning system.

Landscape Effects

A6.6.3 Assessing landscape effects of the Proposed Development on the landscape requires a number of steps broadly summarised as identifying sensitivity of the landscape receptor, establishing the magnitude or scale of the change likely as a result of the Proposed Development and ultimately forming a judgement with respect to the significance of the effect in the context of the EIA (Scotland) Regulations (2017). The identification of significant effects is important because those are the effects that are likely to carry more weight in the decision making (or often referred to as the planning balance). This does not however mean that non-significant effects are not considered.

Sensitivity of Landscape Receptors

A6.6.4 GLVIA3 states that sensitivity of the landscape should be defined by analysing the susceptibility of the landscape receptor to the proposed change (the Proposed Development) and the value of the landscape receptor.

Landscape Value

A6.6.5 Landscape value can be indicated by designation with reference to their importance (International, National, Local level), or with reference to a specific feature or element of the landscape. Landscape value may also be expressed

[28] Land Use Consultants (2016) *England's Light Pollution and Dark Skies Interactive Map* [Online] https://www.nightblight.cpre.org.uk/maps/ (Accessed November 2022)

[29] Institution of Lighting Professionals (2013) Professional Lighting Guide 04: Guidance on undertaking Environmental Lighting Impact Assessments. Institution of Lighting Professionals. Rugby.

[30] Institution of Lighting Professionals (2021) Guidance Note GN01/21 The Reduction of Obtrusive Light. Institution of Lighting Professionals. Rugby.

by other factors described in Box 5.1 (GLVIA3, page 84) which can aid the identification of valued landscapes as follows:

- *'**Landscape quality (condition)**: A measure of the physical state of the landscape. It may include the extent to which typical character is represented in individual areas, intactness of the landscape and the condition of individual elements;*
- ***Scenic quality**: The term used to describe landscapes that appeal primarily to the senses (primarily but not wholly the visual senses);*
- ***Rarity**: The presence of rare elements or features in the landscape or the presence of a rare Landscape Character Type;*
- ***Representativeness**: Whether the landscape contains a particular character, and/or features or elements which are considered particularly important examples;*
- ***Conservation interests**: The presence of features of wildlife, earth science or archaeological or historical and cultural interest can add to the value of the landscape as well as having value in their own right;*
- ***Recreation value**: Evidence that the landscape is valued for recreational activity where experience of the landscape is important;*
- ***Perceptual aspects**: A landscape may be valued for its perceptual qualities, notably wildness and/or tranquillity; and*
- ***Associations**: Some landscapes are associated with particular people, such as artists or writers, or events in history that contribute to perceptions of the natural beauty of the area. (Based on Swanwick and Land Use Consultants (2002)'*

A6.6.6 Non designated landscapes or elements and features still have value but this will be given less weight.

A6.6.7 With regard to the value of dark skies, landscapes can be recognised as places of exceptionally dark night skies where people have committed to keep skies dark through the control of light pollution. Similar to landscape designations, this can be recognised through designation at international level such as Dark Sky Parks, or at a local level through the special qualities of a national or local landscape designation. Similarly, some landscapes may not be formally designated for their dark skies but may be promoted as tourist destinations based on their dark sky attributes or through community led projects.

A6.6.8 Definitions of High, Medium, and Low are used in this LVIA to evaluate landscape value as follows:

Table A6.1: Definitions of landscape value

Value	Definition of Value
High	Areas that exhibit a very strong, positive character and which are in excellent or very good condition with valued features that combine to give an experience of unity, richness, and harmony. As a result, these landscapes may also demonstrate a high scenic quality also. These are landscapes that may be considered to be of particular importance to conserve and which may be particularly sensitive to change if inappropriately dealt with. Smaller areas of especially high quality/value or landscapes which, by virtue of the extent of their positive attributes, may also be described as exceptional. This is likely to apply to International and National designations such as World Heritage Sites, National Parks, National Scenic Areas, Wild Land Areas and Inventoried Historic Gardens and Designed Landscapes.
Medium	Areas that exhibit positive character and are considered to be in good condition with some valued features, but which may have evidence of alteration to/ degradation/erosion of features resulting in areas of more mixed character. Scenic quality and attractiveness may not be as high as for 'High' quality landscape. Change may not necessarily be detrimental nor require special attention to detail. These areas may be valued at the local authority level such as Special Landscape Areas, Non-Inventoried Designed Landscapes
Low	Areas generally negative in character, in average to poor condition with a weak landscape structure and few valued features. Some scope for positive enhancement.

Landscape Susceptibility to Change

A6.6.9 Susceptibility is defined in GLVIA3 as '*the ability of the landscape receptor (whether it be the overall character or quality/condition of a particular landscape 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, para 5.41).

A6.6.10 Indicators that influence the susceptibility of landscape receptors to different types of development being proposed are as follows and include examples that generally indicate a lower susceptibility to wind farm development:

- **Landscape scale and geographical extent**: Large-scale landscapes generally indicate a lower susceptibility to wind farm development;
- **Landform**: Flat plateau/gently undulating land without distinctive topographical features;
- **Skylines**: Screened or less prominent skylines punctuated by modern man-made features;
- **Landscape pattern and complexity**: Landscapes with a simple and regular pattern;
- **Settlement and man-made influences**: Presence of modern, man-made structures such as infrastructural/ industrial features;
- **Inter-visibility with adjacent landscapes and key vistas**: Inward looking areas with no strong vistas or interconnectivity with adjacent landscapes; and
- **Perceptual aspects**: Non remote areas, close to human activity or development (including light pollution).

A6.6.11 The following examples generally indicate a higher susceptibility to wind farm development:

- **Landscape scale**: Small scale landscapes generally indicate a higher susceptibility to wind farm development;
- **Landform**: Variations in topography with distinctive or iconic topographical features;
- **Skylines**: Highly visible, generally undeveloped skylines often punctuated by important landmarks;
- **Landscape pattern and complexity**: Landscapes with a complex, rugged and irregular pattern;
- **Settlement and man-made influences**: Presence of small-scale features, historic/vernacular settlement, and lack of modern development;
- **Inter-visibility with adjacent landscapes**: Landscapes which are integral to the character of adjacent landscapes and feature strongly in views from sensitive landscapes and/or have strong vistas and principal directions of view; and
- **Perceptual aspects**: Remote areas with no visual or audible signs of human activity, development, or light pollution.

A6.6.12 Definitions of High, Medium and Low are used in this LVIA to evaluate landscape susceptibility as follows:

Table A6.2: Definitions of susceptibility of landscape receptor

Susceptibility	Definition of Susceptibility
High	The landscape receptor is highly susceptible to the change proposed by the development. Landscape characteristics have very limited ability to accommodate the development without undue adverse effects.
Medium	The landscape receptor is moderately susceptible to the change proposed by the development. Landscape characteristics have some ability to accommodate certain elements of the development without undue adverse effects
Low	The landscape receptor has low susceptibility to the change proposed by the development. Landscape characteristics are able to accommodate certain elements of the development without undue adverse effects

A6.6.13 GLVIA3 advises that an individual assessment of the susceptibility of receptors to the specific development proposal is a key process and should not be replaced by existing landscape sensitivity and capacity studies. However, such studies have been reviewed to provide a useful guide to inform the evaluation of susceptibility of landscape receptors.

Determination of Landscape Sensitivity

A6.6.14 Both Landscape value and susceptibility are identified as High, Medium, and Low. Professional judgement is used to evaluate this complex relationship between value and susceptibility to determine the overall sensitivity of the landscape receptor to the proposed development. For example, where susceptibility to landscape change may be High but value is considered to be Low, overall landscape sensitivity to wind farm development would generally be expected to be Medium. However, in some cases, landscapes generally attributed the highest value such as international or national landscape designations do not necessarily have a High susceptibility to all types of change. Full justification for the assessment of the sensitivity of a particular receptor is included in the LVIA. The following table is used as a guide only.

Table A6.3: Levels of sensitivity of landscape receptors defined by value and susceptibility

Susceptibility to change ↑	Value of Receptor ←		
	High	Medium	Low
High	High		
Medium		Medium	
Low			Low

Landscape Magnitude of Change

A6.6.15 Judgements of magnitude of change are assessed in terms of the size and scale, geographical extent, duration, and reversibility of the change likely to result from the Proposed Development.

Size & Scale

A6.6.16 The size and scale of the proposed change can refer to individual elements and features (including aesthetic and perceptual elements) that will be lost or changed and the proportion this represents of the total extent within the landscape, and the contribution that that the feature or element makes to the character of the landscape. At a broader scale, the size and scale of the change to a LCT is dependent on the degree in which the character of the landscape is changed or alteration to the key characteristics.

A6.6.17 Existing wind farms (operational or under construction) also form part of the landscape baseline, and the size and scale of change also considers the relationship between the Proposed Development and the other wind farms. This considers issues such as the arrangement of wind farms in the landscape (clustering or dispersal), the relationship between the scale and situation (different landscapes) of the different wind farms, distances between wind farms and ultimately whether the Proposed Development fits comfortably with the overall existing pattern of wind farm development or whether it intensifies the presence of wind farms creating a 'wind farm landscape'.

A6.6.18 The size and scale of change is determined as Major, Moderate, Minor or Negligible and could be either adverse or beneficial.

Geographical Extent

A6.6.19 This refers to the geographical extent over which the landscape change will occur. It is described as being limited at site level, to the immediate site setting (or local area) and to the wider area, across some or all of the LCTs or landscape designation affected.

A6.6.20 The geographical extent of change is determined as Large, Medium, Small or Negligible.

Duration & Reversibility

A6.6.21 The duration of landscape changes is classified as permanent, temporary, or reversible. This can be described as long term (generally lasting over 10 years, including effects that will persist for the 35-year operational lifespan of the wind farm), medium term (generally lasting 5-10 years) and short term (generally lasting 0-5 years).

A6.6.22 Reversibility is related to whether the change can be reversed at the end of the development's lifecycle (including the end of construction or decommissioning which would be short term reversible) For example, operational effects related to the presence of turbines are considered to be reversible as they will be removed during decommissioning at the end of the operational lifespan.

A6.6.23 The duration and reversibility of landscape change is determined as Permanent/irreversible, Long term/reversible, Medium term/reversible or Short term/reversible.

Determination of Magnitude of Landscape Change

A6.6.24 The relationship between all three of the above factors is assessed to determine the overall nature of the change resulting from the introduction of the proposed development. This results in four levels of magnitude. Substantial, Moderate, Slight and Negligible which is outlined in Table A6.4. In general, a Major level of change in terms of size and scale, across a large geographical extent with Long term reversible/permanent, irreversible effects would result in an overall Substantial magnitude of change. However, this is a complex relationship between the different factors of magnitude, and various combinations are possible. Each effect is judged on its own merit and the following table is used as a guide only.

Table A6.4: Levels of magnitude of potential effect defined by size and scale, geographical extent and duration and reversibility

Level of Magnitude	Definition of Magnitude
Substantial	Total loss or major alteration to key elements, features, or perceptual characteristics of the baseline landscape over a large area including the possible introduction of major new and uncharacteristic elements. The post development character and composition of the baseline landscape resource will be fundamentally changed for some distance from the site. Changes would also be deemed permanent and irreversible.
Moderate	Partial loss or alteration to one or more key elements, features, or perceptual characteristics of the baseline landscape over a moderate area, including the possible introduction of moderate new and uncharacteristic elements. The

Level of Magnitude	Definition of Magnitude
	post development character and composition of the baseline landscape resource will be partially, but noticeably changed at a medium distance from the site, including the immediate setting and the landscape character area in which it lies. Changes would be long term, between 10 and 25 years but theoretically reversible.
Slight	Minor loss of or alteration to one or more key elements, features, or perceptual characteristics of the baseline landscape over a small area, including the possible introduction of minor new and uncharacteristic elements. The post development character and composition of the baseline landscape resource will be noticeably changed but the underlying character of the baseline landscape will be similar to the pre-development character. The change would occur only within the site itself or within the immediate vicinity of the development proposal. Changes would be wholly or partially reversible and would be medium term, lasting for up to ten years.
Negligible	Very limited or imperceptible loss or alteration to one or more key elements, features, or perceptual characteristics of the baseline landscape over a negligible area, including negligible effects from the introduction of minor new and uncharacteristic elements. Change to the landscape character will be barely discernible with very limited influence on the landscape character within the site or immediate vicinity of the development proposal. Changes would be reversible, deemed temporary and would last between 0 and 5 years.

A6.6.25 The determination of the magnitude of effect on the designated landscape resource additionally considers the distance from the site at its closest point, potential changes to principal views from within and towards the designated landscape and potential effects on the integrity of the designated landscape, including the extent to which it could affect the policy reasons for designation.

Visual Effects

A6.6.26 Assessing the significance of visual effects of the Proposed Development requires several steps including identifying the sensitivity of the visual receptor, identifying the magnitude or scale of the change to the receptors view, prior to forming a judgement with respect to the significance of the effect in the context of the EIA (Scotland) Regulations 2017.

Sensitivity of Visual Receptors

A6.6.27 The sensitivity or nature of visual receptors is defined by the professional judgement of the interaction between the value of the view experienced by the visual receptor and the susceptibility of the visual receptor (or viewer not the view) to the particular form of change likely to result from the Proposed Development.

Value of View

A6.6.28 Different groups of people attach different levels of value to particular views. Determining the value of a view therefore takes account of the following factors:

- Recognition of the view through the presence of planning designations;
- Importance in relation to heritage assets (such as designed views);
- Popularity of the viewpoint or location; and
- Indicators of the value attached to views by visitors through appearances in promotional tourist literature and the provision of tourist facilities.

A6.6.29 Value can also be attributed to the numbers of people using a route receptor or visiting an attraction. For example, a popular attraction is often considered more sensitive than a less visited attraction. However, there are exceptions to this such as motorways and railways which have a higher number of people but are generally considered to be of lower value; or more remote locations with fewer people visiting but are considered to be of higher sensitivity.

A6.6.30 Views from individual private residential properties and settlements are considered to be highly valued by residents.

A6.6.31 With regard to aviation lighting, the value of views at night-time differs from daytime, an example being viewpoints located within a Dark Sky Park where the value is considered to be High on account of the low levels of light pollution to enable observation of the sky at night. However, in other situations the value of views may decrease at night where the elements that add value to the view are not discernible. Furthermore, the popularity, reason for use and level of use of a viewpoint/location during the day may be completely different to its use at night, or vice versa. These differences are set out for each visual receptor assessed.

A6.6.32 Definitions of High, medium and low are used in this LVIA to evaluate the value of view as follows:

Table A6.5: Defining the value of the view

Value	Definition of Value
High	Views from nationally/internationally known viewpoints which may be covered by a landscape/planning/heritage designation, have important cultural associations, be a popular visitor attraction that is well promoted by tourist literature and where the view forms a key part of the visitor experience.
Medium	Views of regional and local importance which may be covered by a local landscape/planning designation, be a locally popular visitor attraction that is promoted in locally distributed visitor literature and where the view forms a key part of the visitor experience.
Low	Views with no designation or cultural association. Not a promoted area but may still be valued by the local community.

Susceptibility of Visual Receptors to Change

A6.6.33 This aspect of the nature of the receptor refers to the susceptibility of the viewer to the proposed change, not the view. The susceptibility of visual receptors to changes in views is a function of the occupation or activity of people experiencing the view and the extent to which their attention is focused on views

A6.6.34 Viewers of higher susceptibility to changes in views are generally those whose attention or interest is focused on their surroundings, including residents, walkers, and visitors to attractions.

A6.6.35 Viewers of lower susceptibility to changes in views include travellers on non-scenic routes and people at their place of work whose attention is not on their surroundings and where setting is not important to their quality of working life.

A6.6.36 Susceptibility of experiencing night-time lighting is similar criteria to daytime assessment. The susceptibility of people experiencing night-time outdoors will depend on the degree to which their perception is affected by the existing night-time baseline lighting. In brightly lit areas, or when travelling on roads from where sequential experience of lighting may be experienced, the susceptibility of receptors is likely to be lower than from within areas where the baseline contains no or limited existing artificial lighting.

A6.6.37 The following table provides a guide to the susceptibility of different groups of viewers.

Table A6.6: Susceptibility of different groups of visual receptors

Susceptibility	Definition of Susceptibility
High	• Residents; • People participating in landscape dependent outdoor recreation where their attention is focussed on the landscape and particular views; • Visitors to attractions and heritage assets where views are integral to the visitor experience; • Communities where views contribute to the landscape setting; • Travellers on scenic routes where their attention is focussed on the landscape and particular views;
Medium	• Travellers on road, rail and other transport routes where their attention is generally less focussed on the landscape and particular views;
Low	• People participating in outdoor sport and recreation which does not involve the landscape or views; • People at their place of work where the landscape setting is not integral to the quality of their working life; • Travellers where the view is not important to the journey.

Determination of Visual Sensitivity

A6.6.38 The sensitivity of visual receptors is defined by the relationship between the value of views and the susceptibility of different types of viewer to the proposed change. Both value and susceptibility are identified as High, Medium and Low. Professional judgement is used to evaluate this complex relationship between value and susceptibility to determine the overall sensitivity of the visual receptor to the Proposed Development. In general terms, where the value of the view is High and the susceptibility of the viewer to change is Low, the overall sensitivity of the visual receptor would be expected to be Medium. However, this is not formulaic and can be a complex relationship with different combinations possible. The following table is used as a guide only.

A6.6.39 Overall sensitivity of a landscape receptor is identified as High, Medium, and Low.

Table A6.7: Levels of sensitivity of Visual receptors defined by value and susceptibility

Susceptibility of viewer to change ↑	Value of View ←		
	High	Medium	Low
High	High		
Medium		Medium	
Low			Low

Magnitude of Visual Change

A6.6.40 The nature or magnitude of the effect on visual receptors considers the size and scale, geographical extent, duration and reversibility of the change likely to result from the Proposed Development.

A6.6.41 The worst-case scenario is considered during the assessment of the nature (magnitude) of all visual effects. All changes to views are considered as they would occur in winter conditions with minimal screening by vegetation and deciduous trees. ZTVs and wireframes are similarly displayed on the basis of bare ground and therefore demonstrate the maximum extent of visibility possible, in the absence of buildings or vegetation.

Size & Scale

A6.6.42 The size and scale of a visual change refers to the level of change that is likely to occur as a result of the Proposed Development and depends on the following factors:

- 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;
- Distance of the view;
- The degree of contrast or integration of any new features or changes in the view with the existing elements in the view and their characteristics in terms of form, scale and mass, line, height, colour, and texture;
- The nature of the view of the Proposed Development, in terms of how long the view of the Proposed Development would last along sequential routes and whether views will be full, partial or glimpses; and
- The angle of view of the Proposed Development, either direct view or oblique view including the horizontal field of view and movement.

A6.6.43 Existing wind farms also form part of the existing view, and the size and scale of change also considers the relationship between the Proposed Development and these other wind farms. This considers issues such as the arrangement of wind farms in the view e.g. 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 different wind farms in terms of turbine height and number; the position of the wind farms (e.g. on the skyline); distances between wind farms and from the viewer; and ultimately whether the proposed development fits comfortably with the overall existing pattern of wind farm development or whether it intensifies the presence of wind farms by 'infilling' a gap and leading to a greater combined effect.

A6.6.44 Visual receptors which experience no change to the view as a result of the Proposed Development are not assessed in this LVIA.

Geographical Extent

A6.6.45 This refers to the geographical extent over which the visual changes will be visible and whether these are unique views allowing only glimpsed views of the Proposed Development, or whether it is a typical example of a widespread view such as a representative viewpoint.

A6.6.46 For specific, promoted viewpoints, geographical extent may be assessed either as the proportion of a specific area from where a change in view is possible, for example, a small part of a historic designed landscape or as the extent of change within the overall view, for example change occurs in a narrow vista rather than across the full panorama.

A6.6.47 The geographical extent of change is determined as Large, Medium, Small or Negligible.

Duration and Reversibility

A6.6.48 The duration of changes to views are classified as permanent, temporary, or reversible. This can be described as long term (generally lasting over 10 years, including effects that will persist for the 35-year operational lifespan of the wind farm), medium term (generally lasting 5-10 years) and short term (generally lasting 0-5 years, e.g., limited to during construction).

A6.6.49 Reversibility is related to the duration of the change and whether the change can be reversed at the end of the development (including the end of construction which would be short term reversible or the end of decommissioning which would be long term reversible.) For example, operational visual effects related to the

presence of turbines are considered to be reversible as they will be removed during decommissioning, but permanent visual effects are identified after decommissioning owing to continued views of retained tracks.

Determination of Magnitude of Visual Change

A6.6.50 The relationship between all three of the above factors is assessed to determine the overall nature of the visual change resulting from the introduction of the Proposed Development. This results in four levels of magnitude: Substantial, Moderate, Slight and Negligible, which is outlined in Table A6.8. In general, a Major visual change in terms of size and scale, seen from many locations with long term reversible or permanent, irreversible effects would result in an overall Substantial magnitude of visual change. However, this is a complex relationship between the different factors of magnitude, and various combinations are possible. Each effect is judged on its own merit and the following table is used as a guide only.

Table A6.8: Levels of visual magnitude of potential effect defined by size and scale, geographical extent and duration and reversibility

Level of Magnitude	Definition of Magnitude
Substantial	Major visual change which causes a complete or Substantial change in the view as a result of loss of important features or the addition of significant new ones, to the extent that the composition of the view is substantially altered. The change is experienced from many locations across the study area, from the majority of a linear route or from most areas within a specific location and/or by a large number of viewers. Changes would last for 35 years or more and are deemed permanent or irreversible.
Moderate	Moderate visual change which causes a noticeable change in the view as a result of the loss of features or the addition of new ones, to the extent that the composition of the view is altered to a moderate degree. The change is experienced from a Moderate number of locations across the study area, from a Moderate part of a linear route or from a Moderate proportion of an area within a specific location and/or by a moderate number of viewers. Changes would be long term, between 10 and 25 years but theoretically reversible.
Slight	Minor visual change which causes a perceptible change in the view as a result of the loss of features or the addition of new ones, to the extent that this partially alters the composition of the view. The change is experienced from a small number of locations across the study area, from only limited sections of a linear route or from a small proportion of an area within a specific location and/or by a small number of viewers. Changes would be wholly or partially reversible and would be medium term, lasting for up to ten years.
Negligible	Negligible visual change which causes a barely perceptible change in the view as a result of the loss of features or the addition of new ones, to the extent that this barely alters the composition of the view. The change is either not visible or seen by viewers from only one or two locations across the study area, from very limited sections of a linear route or from hardly any locations within a specific area and/or by only a very small number of viewers. Changes would be reversible, deemed temporary and would last between 0 and 5 years.

Judging the Levels of Significance of Effects

A6.6.51 An overall judgement is made on the nature of the receptor and the likely change resulting from the Proposed Development. This judgement is based on evaluations of the individual aspects of value, susceptibility, size and scale, geographical extent, duration, and reversibility. The table below illustrates the four main levels of visual effect that are used in this LVIA; Major, Moderate, Minor and Negligible. Three intermediate combinations are also used for determining landscape effects; Major/moderate, Moderate/minor, and Minor/negligible. The table is not a prescriptive tool, and the evaluation of potential effects makes allowance for the use of professional judgement and experience.

A6.6.52 Landscape Institute advice, contained in GLVIA3 statement of clarification 1/13 (June 2013), states that following the determination of magnitude and sensitivity, '*the assessor should then establish (and it is for the assessor to decide and explain) the degree or level of change that is considered to be significant*'. In accordance with this advice, this LVIA establishes at what level in the assessor's opinion, 'significant' effects arise.

A6.6.53 Those effects considered to be Major and Major/moderate effects by virtue of the more sensitive receptors and the greater magnitude of effects, are considered to be Significant Visual Effects. Moderate, Moderate/minor, Minor, Minor/negligible and Negligible effects are considered to be Not Significant Visual Effects.

Table A6.9: Levels of landscape & visual effects and overall significance

Nature of Effect (Magnitude) ↑ / Nature of Receptor (Sensitivity) ←	High	Medium	Low
Substantial	Major		
Moderate		Moderate	
Slight		Minor	
Negligible			Negligible

A6.6.54 A significant visual effect is considered to be a change in the view that would markedly change the composition of that view.

A6.6.55 It should be noted that significant effects need not be unacceptable or necessarily negative and may be reversible.

A6.7 CUMULATIVE METHODOLOGY

A6.7.1 The aim of the Cumulative Landscape and Visual Impact Assessment (CLVIA) is to identify, predict and evaluate potential key effects arising from the addition of the Proposed Development to a theoretical landscape baseline which includes the existing baseline situation of operational wind farms and those under construction and additionally includes wind farms currently being considered within the planning system, and that may or may not be present in the landscape in the future.

A6.7.2 The methodology for CLVIA follows good practice guidance as set out in the GLVIA3 and *Assessing the Cumulative Effects of Onshore Wind Energy Developments* (SNH, 2012).

Differences between LVIA and CLVIA

Cumulative Approach

A6.7.3 SNH 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*.' This highlights the two possible ways of reporting cumulative effects. The first is to consider only the additional effect that would occur in the cumulative baseline, meaning those effects over and above the effects identified in the LVIA assessment. The second is to redo the LVIA assessment but using the theoretical cumulative baseline, so a combined effect is determined.

A6.7.4 This CLVIA takes the first approach resulting in a stand-alone assessment which identifies the effects of introducing the Proposed Development into the cumulative baseline. It is clearly set out whether the effect has increased or decreased relative to the LVIA assessment or whether the effects will be the same as in the LVIA assessment.

Types of Cumulative Effect

A6.7.5 As with the LVIA, the CLVIA deals with the effects on landscape and visual receptors separately.

Cumulative Landscape Effects

A6.7.6 Cumulative landscape effects are defined as effects on either the physical fabric, aesthetic aspects of the landscape or overall character of the landscape, or any special values attached to it as follows:

- Cumulative effects on the physical fabric of the landscape arise when two or more developments affect the landscape components or features such as woodland, dykes or hedgerows;
- Cumulative effects on the aesthetic aspects of the landscape arise when two or more developments affect the aesthetic or perceptual components of landscape character including scale, sense of enclosure, diversity, pattern and colour and perceptual or experiential attributes such as naturalness, remoteness or tranquillity; and
- Cumulative effects on the landscape character can arise when a new proposal results in a progression from a landscape which contains one development which forms an individual, isolated feature, to a landscape in which two or more developments are evident and may form a significant or dominant characteristic.

Cumulative Visual Effects

A6.7.7 Cumulative visual effects are defined as effects that can be caused by combined visibility, which occurs where the observer is able to see two or more developments from one viewpoint or sequential effects which occur when the observer has to move to another viewpoint to see different developments. (i.e., along linear routes or journeys)

- **Combined visibility** can occur as simultaneous visibility, where more than one development is visible in the same angle of view or successive visibility where two or more developments are present in views from the same viewpoint but cannot be seen at the same time as they are not in the same angle of view. (i.e. the viewer has to turn their head to see the other developments which become visible in succession.); and
- **Sequential visibility** occurs where two or more developments are not present in views from the same viewpoint and cannot, therefore, ever be seen at the same time. The observer has to move to another viewpoint to see the other developments so they will then appear in sequence. Sequential effects are most common along linear routes and journeys. Sequential effects range from frequently sequential when the developments keep appearing regularly and with short time lapses between, depending on speed of travel and distance between the viewpoints, to occasionally sequential, where there may be long time lapses between appearances, because the observer is moving very slowly and/or there are large distances between the areas of visibility.

[31] Assessing the Cumulative Effects of Onshore Wind Energy Developments, SNH, (2012)

Significance of Cumulative Effects

A6.7.8 SNH guidance considers that the concept of a '*threshold of acceptable change*' beyond which turbine developments in a particular area become unacceptable, is a crucial element in identifying significance adverse cumulative effects. In other words, the effect of the present proposal is limited, but when added to the effect of what has already been permitted, or to new proposals which have been submitted for planning permission, it can become over-dominant in planning terms.

Cumulative Sites

A6.1.1 For the purposes of this CLVIA, cumulative sites consist of other wind farm developments only. These are listed in Appendix A6.2.

A6.1.2 An initial cumulative search area of 60 km from the proposed scheme was delineated and a list was prepared including all operational, those schemes under construction, consented schemes, those schemes in the planning system as valid applications and those at the scoping stage within this search area. Recently withdrawn sites have not been included and those sites registered with a Pre-Application Notice (PAN), are not finalised applications and have therefore not been included as a valid application but have been included as a pre-application/scoping scheme.

A6.1.3 The windfarm developments identified in the initial Cumulative Search Area are mapped in the Cumulative Search Area map, Figure 6.11 and are up to date as of 17 November 2022.

A6.1.4 Using this initial Search Area list of developments, an initial cumulative desktop and site assessment was carried out by a CMLI to identify a suitable cumulative baseline (or Cumulative Study Area). In accordance with SNH guidance (2012), the initial Search Area list was therefore refined to establish which turbine developments were of most relevance to the cumulative assessment for the proposal. As the guidance states '*the key principle for all cumulative impact assessments is to focus on the likely significant effects and in particular those which are likely to influence the outcome of the consenting process*'.[31] (para 33 SNH 2012).

A6.1.5 The Cumulative Study Area or cumulative baseline for windfarms was therefore defined to include those developments it was considered required further cumulative assessment. These included all operational, consented, and valid planning applications within an approximate 20 km radius from the proposed site with additional developments to reflect potential sequential and cumulative viewpoints.

A6.1.6 It should be noted that the cumulative baseline represents the '*maximum development scenario*.' It considers the effects of the proposal in addition to other developments that do not yet exist in the current landscape, but which may exist in the future. This results in a high level of uncertainty in the cumulative baseline as not all of the other undetermined proposals will necessarily gain planning approval.

A6.1.7 Owing to this uncertainty with regard to the maximum development scenario, the cumulative baseline is split into different scenarios with a decreasing likelihood of becoming operational.

Cumulative baseline

A6.1.8 The cumulative baseline is divided into different scenarios which reflect which groups of wind farm developments are assumed to be present in the landscape. The existing scenario of operational wind farms and those under construction is assessed in the LVIA and is referred to as **Scenario 1**. The CLVIA considers the following scenarios;

- **Scenario 2**: considers the addition of the proposed development in the context of operational wind farms, those under construction and additionally those developments currently consented. This represents the likely future scenario; and

[4] Siting and Designing Wind Farms in the Landscape Version 2 (SNH, 2014)

- **Scenario 3**: the addition of the proposed development in the context of operational, under construction, consented, undetermined planning applications and wind farm developments currently at appeal i.e. a less certain future scenario.

A6.1.9 Known scoping sites have been included on the wirelines for context but have not been assessed as not all scoping developments would reach planning application stage.

Assessing Cumulative Effects

A6.1.10 The methodology for the CLVIA follows that of the LVIA set out in this Appendix. The key additional steps in the CLVIA were as follows:

- Preparation of ZTV maps for each of the other existing or proposed wind farms and combining them to inform the assessment of scenarios and relationships; and
- Particular attention to the relationships between wind farms in the baseline for each scenario, and how those relationships will change with the addition of the Proposed Development.

A6.1.11 The susceptibility of receptors may be affected by the presence of other wind energy developments. Some viewers may consider that susceptibility is reduced because other wind farms are 'already there', but for others it may be that sensitivity is increased because more development would be 'too much'. However, to retain a consistent and objective approach, the susceptibility of receptors used for the cumulative assessment is taken to be the same as that identified in the LVIA. The value of the receptor would also remain the same in the cumulative assessment and therefore the overall sensitivity of the receptor is considered to be the same as judged in the LVIA.

A6.1.12 In this CLVIA, cumulative effects are reported as the additional effects of the introduction of the Proposed Development, should other cumulative schemes be present in the different baseline scenarios, over and above the effects identified in the LVIA (Scenario 1). For each receptor, it is clarified as to whether the effect has increased or decreased relative to the LVIA assessment, and where necessary the CLVIA states where there will be no cumulative effects over and above those identified in the LVIA assessment.

Assessing cumulative landscape effects

A6.1.13 Assessing the significance of cumulative landscape effects requires the identification of the landscape receptors, the consideration of the nature of the landscape receptors (sensitivity) as identified in the LVIA and the determination of the nature of the effect (magnitude) which would be experienced by each landscape receptor as a result of the addition of the Proposed Development to each baseline scenario.

Landscape receptors of cumulative effects

A6.1.14 The cumulative landscape assessment considers all the LCTs, and designated landscapes assessed in the LVIA as having more than Negligible effects.

Overall significance of cumulative landscape effects

A6.1.15 An overall judgement is made on the nature of the receptor and the likely change resulting from the addition of the Proposed Development. This judgement is based on evaluations of the individual aspects of value and susceptibility of the receptor as identified in the LVIA and the size and scale, geographical extent, duration, and reversibility of the cumulative change. Four main levels of cumulative landscape effect are used in this CLVIA; Major, Moderate, Minor and Negligible. Three intermediate combinations are also used; Major/moderate, Moderate/minor and Minor/negligible. The evaluation of potential effects makes allowance for the use of professional judgement and experience.

A6.1.16 There are varying degrees of cumulative landscape effect. These are as follows;[32]

- Multiple wind farms are seen as separate isolated features within the landscape character type, too infrequent and of insufficient significance to be perceived as a characteristic of the area;
- Multiple wind farms are seen as a key characteristic of the landscape, but not of sufficient dominance to be a defining characteristic of the area;
- Multiple windfarms appear as a dominant characteristic of the area, seeming to define the character type as a 'wind farm landscape character area; and
- Wind farms cross different character types, reducing the distinction between the different types.

A6.1.17 The appropriateness of such effects will depend on the value of a landscape, the objectives for change as defined in local capacity studies and scale of that effect, i.e., whether affecting a local character type or occurring at a regional level.

A6.1.18 A significant cumulative landscape effect is considered to be a Major or Major/moderate landscape effect likely to be when the combination of the multiple wind farms (following the addition of the Proposed Development) become a dominant characteristic of the area and/or reduces the distinction between different character types and/or transforms/re-defines local or wider baseline landscape character.

A6.1.19 It should be noted that significant cumulative effects need not be unacceptable or necessarily negative and may be reversible. Each effect is evaluated on its own merit.

Assessing cumulative visual effects

A6.1.20 Assessing the significance of cumulative visual effects requires the identification of the visual receptors, the consideration of the nature of the visual receptors (sensitivity) as identified in the LVIA and the determination of the nature of the effect (magnitude) which would be experienced by each visual receptor as a result of the addition of the proposed development to each baseline scenario.

Visual receptors of cumulative effects

A6.1.21 The cumulative visual assessment considers all the sequential routes and static locations such as viewpoints or settlements that have theoretical visibility (as shown in the ZTVs) of cumulative wind farm developments and were considered in the LVIA to have more than Negligible effects.

A6.1.22 Cumulative wind farms are shown in the visualisations as required by SNH good practice guidance.[33] In addition, a ZTV to blade tip height of each wind farm proposal has been prepared and then combined with the ZTV of the proposed scheme to create 'paired ZTVs' which illustrate the areas of mutual visibility, i.e., where the proposed scheme and other proposals are both visible from. ZTVs showing the combined visibility of each cumulative baseline scenario have also been prepared to illustrate the total visibility for each scenario.

Magnitude of cumulative visual change

A6.1.23 The nature or magnitude of the cumulative effect on visual receptors as with the LVIA considers the size and scale, geographical extent, duration, and reversibility of the change likely to result from the addition of the Proposed Development to the different baseline scenarios. With particular regard to cumulative effects, the following factors are also considered in determining the magnitude of cumulative visual change from each visual receptor;

- The number of turbine developments visible;
- The prominence of the developments likely to be seen;
- The amount of available view affected;
- The arrangement of turbine developments e.g., developments seen in one direction or in only part of the view, or seen in all directions;

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33 SNH (2017) Visual Representation of Wind Farms, Version 2.2. Landscape Institute.

- The relationship of the scale of the turbine developments including size and number of turbines which may also be expressed as the horizontal and vertical angle occupied by turbines;
- The position of the turbine developments in the view e.g. on the skyline, against the backdrop of land
- The distances from the viewer and between developments;
- The landscape setting, context and separation (or coalescence) of turbine developments; and
- Potential screening by landcover such as vegetation and local variations in topography.

Overall significance of cumulative visual effects

A6.1.24 An overall judgement is made on the nature of the receptor and the likely change resulting from the addition of the Proposed Development. This judgement is based on evaluations of the individual aspects of value and susceptibility of the receptor as identified in the LVIA and the size and scale, geographical extent, duration, and reversibility of the cumulative change. Four main levels of cumulative visual effect are used in this CLVIA; Major, Moderate, Minor and Negligible. Three intermediate combinations are also used; Major/moderate, Moderate/minor and Minor/negligible. The evaluation of potential effects makes allowance for the use of professional judgement and experience.

A6.8 SUPPORTING FIGURES & VISUALISATIONS

A6.8.1 The LVIA has been supported by a number of figures and visualisations. The following sets out the methodology for the production of the figures and visualisations.

Zone of Theoretical Visibility

A6.8.2 ZTVs have been generated to aid the understanding of the extent of theoretical visibility of the Proposed Development. ZTVs have been used through the different stages of the Proposed Development from the initial feasibility study, through the evolution of the layout design, and have informed the extent of the study area and identification of landscape and visual receptors that are likely to be affected.

A6.8.3 ZTVs takes no account of the potential screening effects of intervening factors such as forestry/woodland, vegetation, buildings, recent modifications to landforms, or weather conditions. Therefore, ZTVs represent the 'worst case scenario' and over represent the extent of visibility of the Proposed Development. It is important to note, NatureScot guidance states*: 'ZTVs indicate areas from where a wind farm is theoretically visible within the study area, but they cannot show what it would look like, nor indicate the nature or magnitude of landscape or visual impacts'.*

A6.8.4 ZTV maps have been created using QGIS 3.4.4 Software and Ordnance Survey (OS) Square Grid Terrain 50 m Digital Terrain Model (DTM) by experienced GIS Analysts. In accordance with best practice, the viewer height of the ZTV has been set at 2 m Above Ground Level (AGL) and the tool outputs were coloured in transparent bands to represent the number of turbines visible at tip and hub heights, aviation lighting intensity and interaction with operational/under construction and cumulative developments.

A6.8.5 A series of ZTVs have been produced to provide an illustration of potential light intensities from the aviation lights, both as an overview, and individually for each lit turbine.

Assumptions

A6.8.6 ZTVs have the following assumptions and limitations:

- The DTM data from which the ZTV has been calculated from is Ordnance Survey Terrain 50 (12/02/2020) 50 m resolution and has not been down sampled;
- No non-bare-ground ZTVs have been used in this LVIA;
- The viewer height has been set at 2 m Above Ground Level (AGL);
- Earth curvature correction parameters have been applied with a light refractivity coefficient of 0.13;
- The ZTV has been created to an extent of 45 km from the outermost turbines with 10 km distance rings;
- Turbine heights were based on the candidate turbine described in Chapter 4: Project Description;
- The software used to create the ZTV does not use mathematically approximate methods;
- A ZTV is only accurate as the data on which it is based, and the algorithm used in its calculation;
- A ZTV alone cannot indicate the potential visual impacts of a development, nor show the likely significance of impacts, therefore it shows theoretical visibility only;
- It is not easy to test the accuracy of a ZTV in the field, although some verification will occur during the assessment from viewpoints; and
- The accuracy of most DTMs is limited and they do not include accurate representation of minor topographic features and may not represent areas of recent topographic change, such as opencast coal mines, spoil heaps and road cuttings.

A6.8.7 Analysis of the ZTV identified areas where the proposed turbines would be theoretically visible within the 45 km study area. This process also identified those areas where there would be limited or no visibility of the Proposed Development, which allowed some landscape and visual receptors to be scoped out of the assessment.

Supporting Figures

A6.8.1 Supporting figures have been produced to show LCTs, protected and designated landscapes, visual receptors and cumulative developments located within the study area. The data for these figures has been obtained from publicly accessible websites, fieldwork and a desk review of relevant literature and guidance concerning the identified landscape and visual receptors likely to be affected by the Proposed Development.

Photography

A6.8.2 Baseline photography has been undertaken by a professional photographer for viewpoint locations used in the LVIA and Cultural Heritage assessments, and for the Residential Visual Amenity Assessment.

A6.8.3 Photography was undertaken using a Canon EOS 1ds MkIII full frame sensor, Digital Single Lens Reflex (DSLR) camera with a 50mm f1.4 lens mounted on a Calumet CK8157 tripod with Manfrotto 303 Plus. Grid coordinates and elevation were recorded on a Garmin Etrex GPS. Camera settings were RAW -ISO 400 except for low-light conditions with minimal adjustment.

A6.8.4 A 360-degree panorama was undertaken at 1.5 m AGL ensuring a 50% overlap between photographs to minimise distortion when stitching the photographs together. Photographs are taken in landscape format unless locations are close where photographs are then taken in portrait format to enable the vertical extent of the turbines to be included in the photograph.

A6.8.5 At night-time, baseline photography is recorded at either dawn (approximately 30 minutes prior to sunrise) or dusk (approximately 30 minutes after sunset). The objective for night-time viewpoint photography is to represent, as far as is practical, the baseline lighting levels as they would be perceived by the human eye. To achieve this, camera settings are used to meet this requirement, and settings which artificially brighten the image are not used.

A6.8.6 During the visit to each viewpoint, the grid reference was recorded, ground level and camera viewing height along with a brief description of the nature of the view, weather conditions and visibility. Details of the time and date, camera make and model, lens focal length, shutter speed, f-number and ISO speed rating are recorded as metadata in each photograph file. Additionally, a photograph of the tripod position was also taken at each location.

Wirelines

A6.8.7 Wirelines have been created using ReSoft Windfarm Software and 50 m plus – or 1 m Terrain DTM data for all viewpoints in the LVIA and Cultural Heritage assessment (see Chapter 10: Cultural Heritage). Turbine data is based on the candidate turbine described in Chapter 4: Project Description and data gathered for the cumulative assessment for cumulative Scenarios 1, 2 and 3. Using this information, the software then generated a horizontal view wireline of the Proposed Development from viewpoints. These were exported as images at viewcone angles of 90° and 53.5° for the best representation of what a person will see. Turbines shown on the wirelines are shown to face the viewer with the highest turbine blade pointing directly vertical. It should be noted that similar to ZTVs, wirelines are based on bare ground and do not consider the effects from intervening screening such as vegetation, trees, woodland/forestry, buildings, or minor variations in topography.

Visualisation Production

A6.8.8 Photomontages have been generated for the same viewpoint locations and comply with the NatureScot guidance. Visualisations have been produced to illustrate a 53.5° horizontal Field of View (FoV) and a vertical field of view of 18.2 degrees to capture the Proposed Development and sufficient landscape and visual context.

A6.8.9 Viewpoint photography was stitched together using Microsoft ICE software and imported and lined up to match the viewcone defined for the wireline. Once the photos are aligned, the proposed turbines were rendered onto the photo using paint.net and exported as images. Similar to the wirelines, the proposed turbines are shown to face the viewer but with random rotations to provide a greater sense of realism.

A6.8.10 NatureScot guidance recognise that the production of night-time visualisations to accurately represent aviation lighting is difficult to achieve and is an emerging area of study. This is due to the limitations in in being able to model the light intensity over distance whilst considering variable lighting conditions and atmospheric conditions. The rendering or visual representation of the proposed aviation lights has been achieved using paint.net and a comparative study of photography of actual turbine lighting in similar lighting conditions and viewing distances.

Viewing Instructions

A6.8.11 NatureScots guidance (2017) states:

'Visualisations, whether they are hand drawn sketches, photographs or photomontages can <u>never</u> exactly match what is experienced in reality*. They should, however, provide a representation of the proposal that is accurate enough for the potential impacts to be fully understood.*

The assessor, consultees, decision-makers and any interested parties or members of the public should ideally visit the viewpoint(s) where visualisations can be compared to the 'real life' view. It is acknowledged this is not always possible – time, weather and accessibility will restrict the number of viewpoints which can be visited.

Interpretation of visualisations must take account of additional information specific to the proposal, viewpoint and landscape which cannot be shown on a single 2-dimensional image. Factors include variable lighting, movement of turbine blades, seasonal differences and movement of the viewer through the landscape. Visualisations in themselves can never provide the full picture in terms of potential impacts; they only inform the assessment process by which judgements are made.'

A6.8.12 The guidance goes on to provide specific guidance to be undertaken when viewing visualisations as follows:

'it is recommended that photomontages are simply viewed at a comfortable arm's length*. This will vary depending on the length of the viewer's arms and their eyesight. However, the difference in viewing distance which results will have little impact on the impression of scale / depth in the image due to the increased size of the images. An instruction to view images at a 'comfortable arm's length' should be included on all visualisations produced. They should also* ***be viewed flat*** *as they are in planar projection.*

Planar projection has been chosen for the photomontages as it is easier to use both in print and on screen (a computer screen cannot be curved to view a cylindrical image). Both planar and cylindrical projections have limitations. The main limitation of planar projection is that, if viewed incorrectly, it can slightly increase the scale of turbines at the edge of the image. ***Ideally the viewer should view the image with their eyes in the centre*** *– however, in practice the difference in scale in most images will be difficult to perceive.'*