

Appendix 13.A Method used in Assessing Landscape and Visual Impact Effects

Introduction

Landscape and Visual Impact Assessment (LVIA) is a tool used to identify the effects of development on *“landscape as an environmental resource in its own right and on people’s views and visual amenity”* (GLVIA3, paragraph 1.1). GLVIA3¹ (paragraph 2.22) states that these two elements, although inter-related, should be assessed separately. GLVIA3 is the main source of guidance on LVIA.

Landscape is a definable set of characteristics resulting from the interaction of natural, physical and human factors: it is a resource in its own right. Its assessment is distinct from visual assessment, which deals specifically with effects on the views and visual amenity of different groups of people at particular locations. Clear separation of these two topics is recommended in GLVIA3.

As GLVIA3 (paragraph 2.23) states, professional judgement is an important part of the LVIA process: whilst there may be some scope for objective measurement of landscape and visual changes, much of the assessment must rely on qualitative judgements. It is critical that these judgements are based upon a clear and transparent method so that the reasoning can be followed and examined by others.

Impacts can be defined as the action being taken, whereas effects are the changes result from that action. This method of assessment assesses landscape and visual effects.

Landscape and visual effects can be positive, negative or neutral in nature. Positive effects are those which enhance and/or reinforce the characteristics which are valued. Negative effects are those which remove and/or undermine the characteristics which are valued. Neutral effects are changes which are consistent with the characteristics of the landscape or view.

In LVIAs which form part of an EIA, it is necessary to identify significant and non-significant effects. In non-EIA LVIAs, also known as appraisals, the same principles and process as LVIA may be applied but, in so doing, it is not required to establish whether the effects arising are or are not significant given that the exercise is not being undertaken for EIA purposes (see GLVIA3 statement of clarification 1/13 10-06-13, Landscape Institute).

¹ Landscape Institute and Institute of Environmental Management and Assessment ‘Guidelines for Landscape and Visual Impact Assessment’ (Third Edition, April 2013)

Landscape Effects

Landscape, as defined in the European Landscape Convention, is “an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors”, (Council of Europe, 2000). Landscape does not apply only to special or designated places, nor is it limited to countryside.

GLVIA3 (paragraph 5.34) recommends that the effect of the development on landscape receptors is assessed. Landscape receptors are the components of the landscape that are likely to be affected by the proposed development, and can include individual elements (such as hedges or buildings), aesthetic and perceptual aspects (for example sense of naturalness, tranquillity or openness), or, at a larger scale, the character of a defined character area or landscape type. Designated landscapes, such as National Parks or Areas of Outstanding Natural Beauty (AONBs), may also be treated as landscape receptors, in which case attention is also given to effects on their special qualities.

This assessment is being undertaken because the proposed development has the potential to remove or add elements to the landscape, to alter aesthetic or perceptual aspects, and to add, remove or alter characteristics and thus potentially change overall character.

Judging landscape effects requires a methodical assessment of the sensitivity of the landscape receptors to the proposed development and the magnitude of effect which would be experienced by each receptor. The criteria and definitions used in making these judgements are set out below.

Landscape Sensitivity

The sensitivity of landscape receptors is assessed by combining assessments of the value attached to each receptor and the susceptibility of each receptor to the type of change which is proposed. (GLVIA3, paragraph 5.39).

Value Attached to Landscape Receptors

Landscape receptors may be valued at community, local, national or international level. Existing landscape designations provide the starting point for this assessment, as set out in **Table 13A-1** below.

The table sets out the interpretation of landscape designations in terms of the value attached to different landscape receptors. As GLVIA3 (paragraph 5.24) notes, at the local scale of an LVIA study area it may be found that the landscape value of a specific area may sometimes be different to that suggested by the presence or absence of a formal designation.

Table 13A-1: Interpretation of Landscape Designations

| Designation | Description | Value |
|--|---|-----------------|
| World Heritage Sites, candidate World Heritage Site | Unique sites, features or areas identified as being of international importance according to UNESCO criteria. Consideration should be given to their settings especially where these contribute to the attributes of outstanding universal value for which such an area of landscape is valued. | International |
| National Parks | Areas of landscape identified as being of national importance. Consideration should be given to their settings especially where these contribute to the special qualities for which the landscape is valued. | National |
| Local Landscape Designations (such as Areas of High Amenity) included in local planning documents; or other landscapes of identified value | Areas of landscape identified as having value, which are either recognised at the local authority level by a local designation or other equivalent recognition of value OR are landscapes considered to have elevated value, having regard to the criteria in Table 2 below and/or by virtue of demonstrable physical attributes. | Local Authority |
| Undesignated landscapes | Landscapes which do not have any formal designation, and which are not considered to have demonstrable physical attributes that elevate their value, but which may be valued by local communities. | Community |
| Undesignated landscapes with negative attributes | Landscapes with no designations or demonstrable physical attributes that elevate their value, which are in poor condition or are degraded or fundamentally altered by presence of man-made structures judged to be intrusive. | Low |

Where landscapes are not designated and where no other local authority guidance on value is available, an assessment is made by reference to criteria in the **Table 13A-2** below. This is based on Table 1 of Landscape Institute Technical Guidance Note 2/21. These factors are not fixed and should be reviewed on a case-by-case basis. When assessing landscape value of a site it is important to consider not only the site itself but also its context.

Landscapes may be judged to be of local authority or community value on the basis of one or more of these factors. There may also be occasional circumstances where an undesignated landscape may be judged to be of national value, for example where it has a clear connection with a nationally designated landscape or is otherwise considered to be of equivalent value to a national designation. Similarly, on occasions there may be areas within designated landscapes that do not meet the designation criteria or demonstrate the key characteristics/special qualities in a way that is consistent with the rest of the designated area.

An overall assessment is made for each landscape receptor, based on an overview of the above criteria, to determine its value - whether for example it is comparable to a local authority landscape designation or similar, or whether it is of value to local people and communities. For example, an intact landscape in good condition, where scenic quality, tranquillity, and/or conservation interests make a particular contribution to the landscape, or where there are important cultural or historical associations, might be of equivalent value

to a local landscape designation. Conversely, a degraded landscape in poor condition, with no particular scenic qualities or natural or cultural heritage interest is likely to be considered of limited landscape value.

Table 13A-2: Factors Considered in Assessing the Value of Non-Designated Landscapes

| Factor | Criteria |
|---|--|
| Natural Heritage | Landscape with clear evidence of ecological, geological, geomorphological or physiographic interest. Presence of wildlife and habitats that contribute to the sense of place. Landscape which contains valued natural capital assets that contribute to ecosystem services. |
| Cultural Heritage | Landscape with clear evidence of archaeological, historical or cultural interest. Landscape which contributes to the significance of heritage assets. Landscape which offers a dimension of time depth. |
| Landscape Condition | Landscape which is in a good physical state both with regard to individual elements and overall landscape structure. Absence of detracting/incongruous features. |
| Associations | Landscape which is connected with notable people, events and the arts. |
| Distinctiveness | Landscape that has a strong sense of identity or place. Presence of distinctive features that are characteristic of a place, or presence of rare/unusual features that confer a strong sense of place. Includes landscape that makes an important contribution to the character or identity of a settlement. |
| Recreational | Landscape offering recreational opportunities where experience of landscape is important. Includes open access areas, common land and rights of way where appreciation of the landscape is an important element of the experience. Landscape that forms part of a view that that is important to the enjoyment of a recreational activity. |
| Perceptual (Scenic) | Landscape that appeals to the senses, primarily the visual sense. Distinctive features, or distinctive combinations of features. Strong aesthetic qualities. Visual diversity or contrasts. Memorable/distinctive views or landmarks, or landscape that contributes to these. |
| Perceptual (Wildness and Tranquillity) | Landscape with a strong perceptual value notably remoteness, wildness, tranquillity and/or dark skies. |
| Functional | Landscape which performs a clearly identifiable and valuable function, particularly in the healthy functioning of the landscape. Natural hydrological systems, important parts of the green infrastructure network, pollinator rich habitats. Landscapes that have strong physical or functional links with an adjacent national landscape designation or are important to the appreciation of the designated landscape and its special qualities. |

Susceptibility of Landscape Receptors to Change

As set out in GLVIA3, susceptibility refers to the ability of the landscape receptor to “*accommodate the proposed development without undue adverse consequences for the baseline situation and/or the achievement of landscape planning policies and strategies*”. Judgement of susceptibility is particular to the specific characteristics of the proposed development and the ability of a particular landscape or feature to

accommodate the type of change proposed, and makes reference to the criteria set out in **Table 13A-3** below. Aspects of the character of the landscape that may be affected by a particular type of development include landform, skylines, land cover, enclosure, human influences including settlement pattern and aesthetic and perceptual aspects such as the scale of the landscape, its form, line, texture, pattern and grain, complexity, and its sense of movement, remoteness, wildness or tranquillity.

For example, an urban landscape which contains a number of industrial buildings may have a low susceptibility to buildings of a similar scale and character. Conversely a rural landscape containing only remote farmsteads is likely to have a high susceptibility to large scale built development.

Table 13A-3: Landscape Receptor Susceptibility to Change

| Susceptibility | Criteria |
|----------------|--|
| High | The landscape receptor is highly susceptible to the proposed development because the key characteristics of the landscape have no or very limited ability to accommodate it without transformational adverse effects, taking account of the existing character and quality of the landscape. |
| Medium | The landscape receptor is moderately susceptible to the proposed development because the relevant characteristics of the landscape have some ability to accommodate it without transformational adverse effects, taking account of the existing character and quality of the landscape. |
| Low | The landscape receptor has low susceptibility to the proposed development because the relevant characteristics of the landscape are generally able to accommodate it without transformational adverse effects, taking account of the existing character and quality of the landscape. |

Defining Sensitivity

As has been noted above, the sensitivity of landscape receptors is defined in terms of the relationship between value and susceptibility to change as indicated in **Figure 13A-1** below. This summarises the general nature of the relationship, but it is not formulaic and only indicates general categories of sensitivity. Professional judgement is applied on a case-by-case basis in determining sensitivity of individual receptors with the diagram only serving as a guide.

Table 13A-4 below summarises the nature of the relationship, but it is not formulaic and only indicates general categories of sensitivity. Judgements are made about each landscape receptor, with the table serving as a guide.

Where, taking into account the component judgements about the value and susceptibility of the landscape receptor, sensitivity is judged to lie between levels, an intermediate assessment of high/medium or medium/low is adopted. In a few limited cases a category of less than low (very low) may be used where the landscape is of low value and susceptibility is particularly low.

Figure 13A-1: Levels of Sensitivity defined by Value and Susceptibility of Landscape Receptors

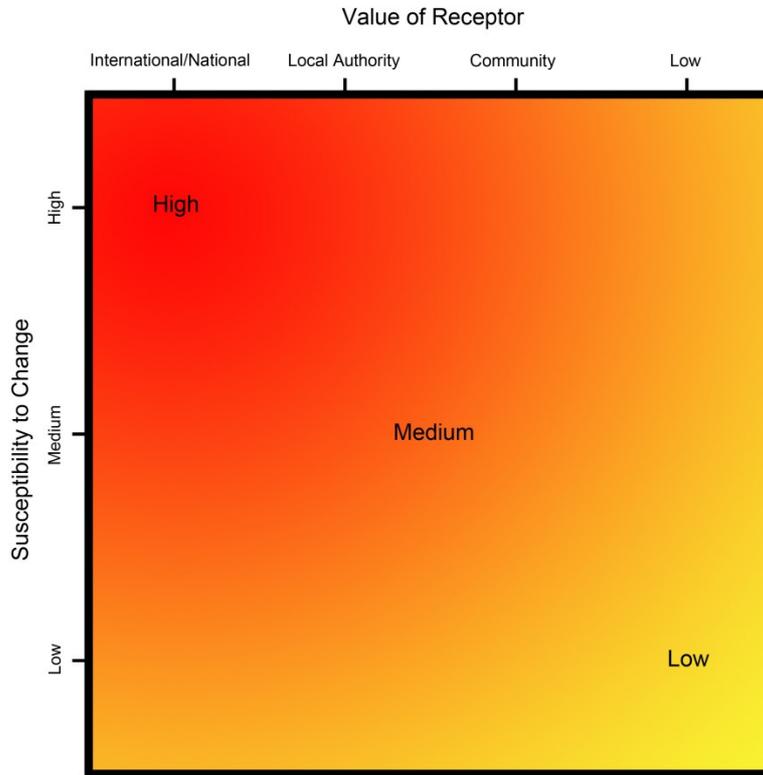


Table 13A-4: Example Levels of Sensitivity defined by Value and Susceptibility of Landscape Receptors

| Sensitivity | Criteria |
|-------------|---|
| High | The landscape receptor is of international or national value and is considered to have high susceptibility to the effects of the proposed development OR The landscape receptor is of national value and is considered to have medium susceptibility to the effects of the proposed development |
| Medium | The landscape receptor is of international or national value and is considered to have low susceptibility to the effects of the proposed development OR The landscape receptor is of local authority value and is considered to have high susceptibility to the effects of the proposed development OR The landscape receptor is of local authority value and is considered to have medium susceptibility to the effects of the proposed development OR The landscape receptor is of community value and is considered to have high susceptibility to the effects of the proposed development |

| Sensitivity | Criteria |
|-------------|--|
| Low | <p>The landscape receptor is of local authority value and is considered to have low susceptibility to the effects of the proposed development</p> <p>OR</p> <p>The landscape receptor is of community value and is considered to have medium susceptibility to the effects of the proposed development</p> <p>OR</p> <p>The landscape receptor is of community value and is considered to have low susceptibility to the effects of the proposed development</p> |

Magnitude of Landscape Change

The magnitude of landscape change is established by assessing the size or scale of change, the geographical extent of the area influenced and the duration and potential reversibility of the change.

Size and Scale of Change

The size and/or scale of change in the landscape takes into consideration the following factors:

- the extent/proportion of landscape elements lost or added; and/or
- the degree to which aesthetic/perceptual aspects are altered; and
- whether this is likely to change the key characteristics of the landscape.

The criteria used to assess the size and scale of landscape change are based upon the amount of change that will occur as a result of the proposed development, as described in **Table 13A-5** below.

Table 13A-5: Magnitude of Landscape Change - Size/Scale of Change

| Category | Description |
|---------------------------------|--|
| Large level of landscape change | <p>There would be a large level of change in landscape character, and especially to the key characteristics if, for example, the proposed development:</p> <ul style="list-style-type: none"> • becomes a dominant feature in the landscape, changing the balance of landscape characteristics; and/or • would dominate important visual connections with other landscape types, where this is a key characteristic of the area. |

| Category | Description |
|---|--|
| Medium level of landscape change | <p>There would be a medium level of change in landscape character, and especially to the key characteristics if, for example:</p> <ul style="list-style-type: none"> the proposed development would be more prominent but would not change the overall balance or composition of the landscape; and/or key views to other landscape types may be interrupted intermittently by the proposed development, but these views would not be dominated by them. |
| Small level of landscape change | <p>There would be a small level of change in landscape character, and especially to the key characteristics if, for example:</p> <ul style="list-style-type: none"> there would be no introduction of new elements into the landscape and the proposed development would not significantly change the composition/balance of the landscape. |
| Negligible/no level of landscape change | <p>There would be a negligible or no level of change in landscape character, and especially to the key characteristics if, for example, the proposed development would be a small element and/or would be a considerable distance from the receptor.</p> |

Geographical Extent of Change

The geographical extent of landscape change is assessed by determining the area over which the changes will influence the landscape, as set out in **Table 13A-6**. For example, this could be at the site level, in the immediate setting of the site, or over some or all of the landscape character types, or areas affected.

Table 13A-6: Magnitude of Landscape Change - Geographical Extent

| Category | Description |
|---------------------------------------|---|
| Large extent of landscape change | Affects a wider area further from the site itself. |
| Medium extent of landscape change | Landscape change extends beyond the site boundaries. |
| Small extent of landscape change | The change will affect a small geographical area. A localised change, often focused on the site itself. |
| Negligible extent of landscape change | Change affects only a very small geographical area. |

Duration and Reversibility of Change

The duration of the landscape change is categorised in **Table 13A-7** below, which considers whether the change will be permanent and irreversible or temporary and reversible. The levels of duration are based on the EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (May 2022).

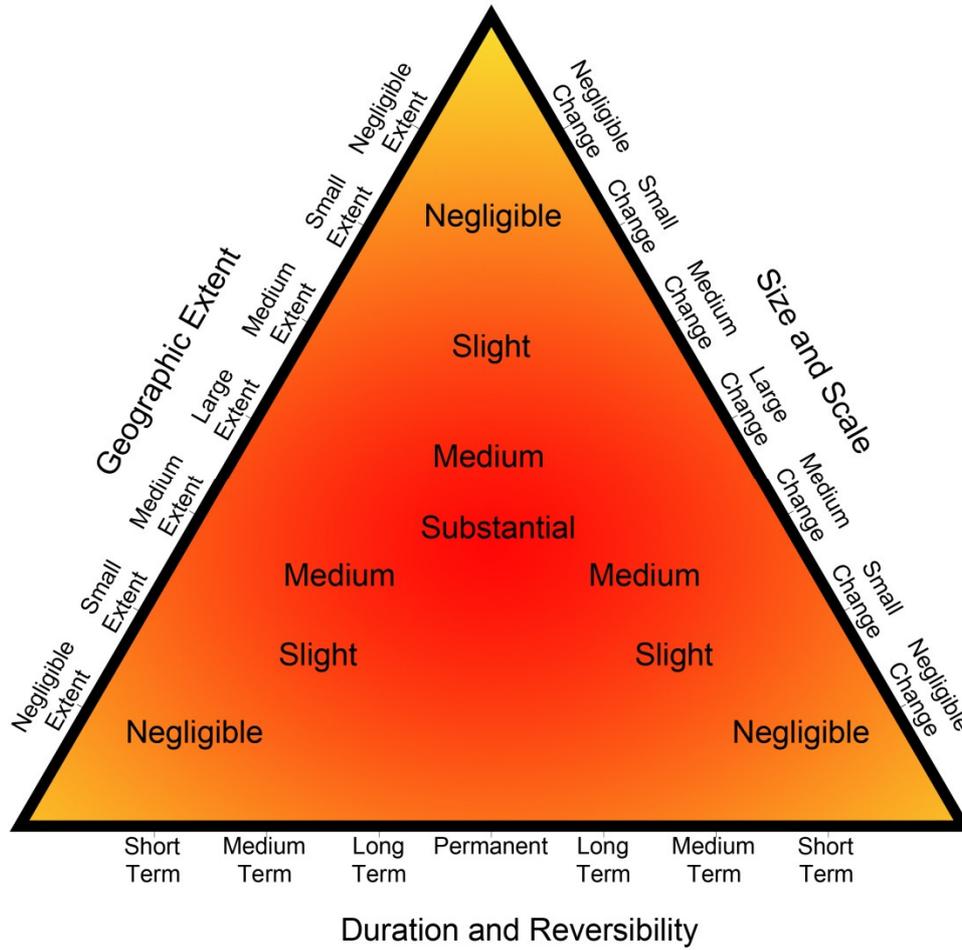
Table 13A-7: Duration and Reversibility

| Category | Description |
|--------------------------------------|--|
| Permanent/ Irreversible | Change that will last for over 60 years and is deemed permanent or irreversible. |
| Long-term reversible | Change that will last between 15 and 60 years and is potentially, or theoretically reversible. |
| Medium-term reversible | Change that will last between 7 and 15 years and is wholly or partially reversible. |
| Temporary/ Short- term reversible | Change that will last from 0 to 7 years and is reversible - includes construction effects. |

Deciding on Overall Magnitude of Landscape Change

The relationships between the three factors that contribute to assessment of the magnitude of landscape effects are illustrated graphically, as a guide, in **Figure 13A-2** below. Various combinations are possible, and the overall magnitude of each effect is determined using professional judgement rather than by formulaic application of the relationships in the diagram.

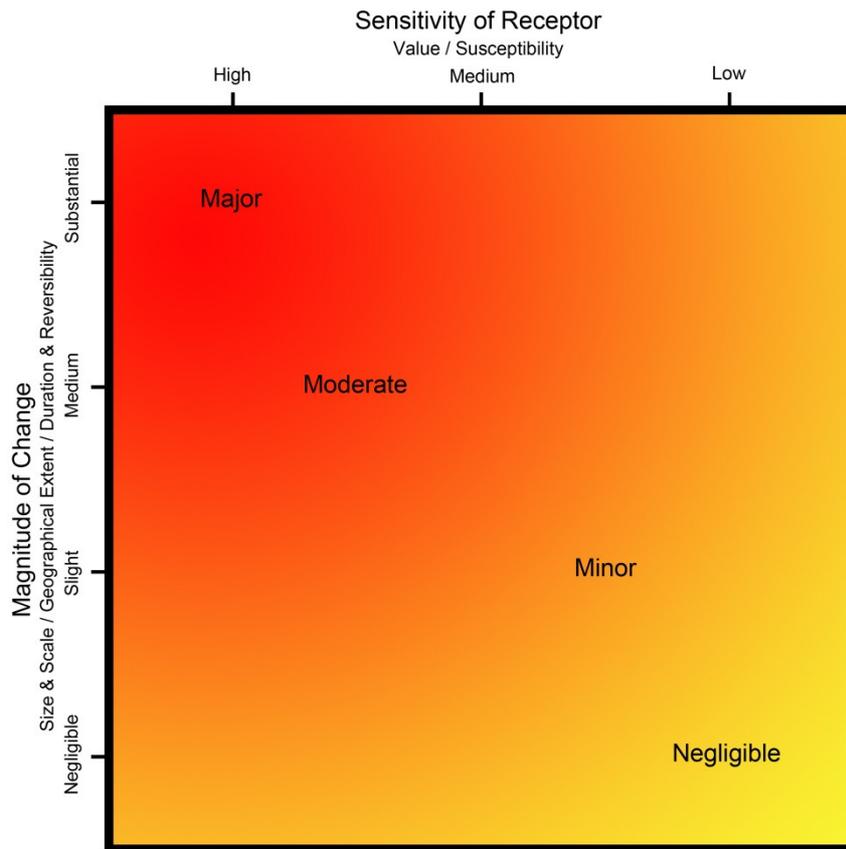
Figure 13A-2: Determining the Magnitude of Landscape Change



Assessment of Landscape Effects

The assessment of landscape effects is defined in terms of the relationship between the sensitivity of the landscape receptors and the magnitude of the change. The diagram below (Figure 13A-3) summarises the nature of the relationship, but it is not formulaic. Judgements are made about each landscape effect using this diagram as a guide.

Figure 13A-3: Assessment of Landscape Effects



Visual Effects

Visual effects are the effects of change and development on the views available to people and their visual amenity. Visual receptors are the people whose views may be affected by the proposed development. They generally include users of public rights of way or other recreational facilities or attractions; travellers who may pass through the study area because they are visiting, living or working there; residents living in the study area, either as individuals or, more often, as a community; and people at their place of work. They may include:

- Communities within settlements (i.e. towns and villages);
- Residents of individual properties and clusters of properties outside settlements;
- People using nationally designated or regionally promoted footpaths and cycle routes;
- Visitors at publicly accessible sites including, for example, gardens and designed landscapes, historic sites, and other visitor attractions or outdoor recreational facilities where the landscape or seascape is an important part of the experience;
- Users of outdoor sport and recreation facilities;
- Visitors staying at caravan parks or camp sites;
- Road users on recognised scenic or promoted tourist routes;
- Users of other roads;
- Rail passengers;
- People at their place of work.

Judging visual effects requires a methodical assessment of the sensitivity of the visual receptors to the proposed development and the magnitude of effect which would be experienced by each receptor.

Viewpoints are chosen, ideally in discussion with the competent authority and other stakeholders and interested parties, for a variety of reasons but most commonly because they represent views experienced by relevant groups of people.

Visual Sensitivity

Sensitivity of visual receptors is assessed by combining an assessment of the susceptibility of visual receptors to the type of change which is proposed with the value attached to the views (GLVIA3, paragraph 6.30).

Value Attached to Views

Different levels of value are attached to the views experienced by particular groups of people at particular viewpoints. Assessment of value takes account of a number of factors, including:

- Recognition of the view through some form of planning designation or by its association with particular heritage assets; and
- The popularity of the viewpoint, in part denoted by its appearance in guidebooks, literature or art, or on tourist maps, by information from stakeholders and by the evidence of use including facilities provided for its enjoyment (seating, signage, parking places, etc.); and
- Other evidence of the value attached to views by people including consultation with local planning authorities, some of whom have carried out assessments of valued views, and professional assessment of the quality of views.

The assessment of the value of views is summarised in **Table 13A-8** below. These criteria are provided for guidance only.

Table 13A-8: Examples of Factors Considered in assessing the Value Attached to Views

| Value | Criteria |
|--------|--|
| High | <p>Views from nationally (and in some cases internationally) known viewpoints, which:</p> <ul style="list-style-type: none"> • have some form of planning designation; or • are associated with internationally or nationally designated landscapes or important heritage assets; or • are promoted in sources such as maps and tourist literature; or • are linked with important and popular visitor attractions where the view forms a recognised part of the visitor experience; or • have important cultural associations. <p>Also, may include views judged by assessors to be of high value.</p> |
| Medium | <p>Views from viewpoints of some importance at regional or local levels, which:</p> <ul style="list-style-type: none"> • have some form of local planning designation associated with locally designated landscapes or areas of equivalent landscape quality; or • are promoted in local sources; or • are linked with locally important and popular visitor attractions where the view forms a recognised part of the visitor experience; or • have important local cultural associations. <p>Also, may include views judged by the assessors to be of medium value.</p> |
| Low | <p>Views from viewpoints which, although they may have value to local people:</p> <ul style="list-style-type: none"> • have no formal planning status; or |

| Value | Criteria |
|-------|---|
| | <ul style="list-style-type: none"> • are not associated with designated or otherwise high-quality landscapes; or • are not linked with popular visitor attractions; or • have no known cultural associations. <p>Also, may include views judged by the assessors to be of low value.</p> |

Susceptibility of Visual Receptors to Change

The susceptibility of different types of people to changes in views is mainly a function of:

- The occupation or activity of the viewer at a given viewpoint; and
- The extent to which the viewer's attention or interest be focussed on a particular view and the visual amenity experienced at a given view.

The susceptibility of different groups of viewers is assessed with reference to the guidance in **Table 13A-9** below. However, as noted in GLVIA3 *“this division is not black and white and, in reality, there will be a gradation in susceptibility to change”*. Therefore, the susceptibility of each group of people affected is considered for each project and assessments are included in the relevant text in the report.

Table 13A-9: Visual Receptor Susceptibility to Change

| Susceptibility | Criteria |
|----------------|--|
| High | Residents; People engaged in outdoor recreation where their attention is likely to be focused on the landscape and on particular views; Visitors to heritage assets or other attractions where views of the surroundings are an important part of the experience; Communities where views contribute to the landscape setting enjoyed by the residents. |
| Medium | Travellers on scenic routes where the attention of drivers and passengers is likely to be focused on the landscape and on particular views. People engaged in outdoor sport or recreation, which may involve appreciation of views e.g. users of golf courses. |
| Low | People engaged in outdoor sport or recreation, which does not involve appreciation of views; People at their place of work whose attention is focused on their work; Travellers, where the view is incidental to the journey. |

Defining Sensitivity

The sensitivity of visual receptors is defined in terms of the relationship between the value of views and the susceptibility of the different receptors to the proposed change. **Figure 13A-4** below summarises the nature of the relationship; it is not formulaic and only indicates general categories of sensitivity. Judgements are

made on merit about each visual receptor, with the table below only serving as a guide. **Table 13A-10** sets down the main categories that may occur but again it is not comprehensive and other combinations may occur.

Figure 13A-4: Levels of Sensitivity Defined by Value and Susceptibility of Visual Receptor Groups

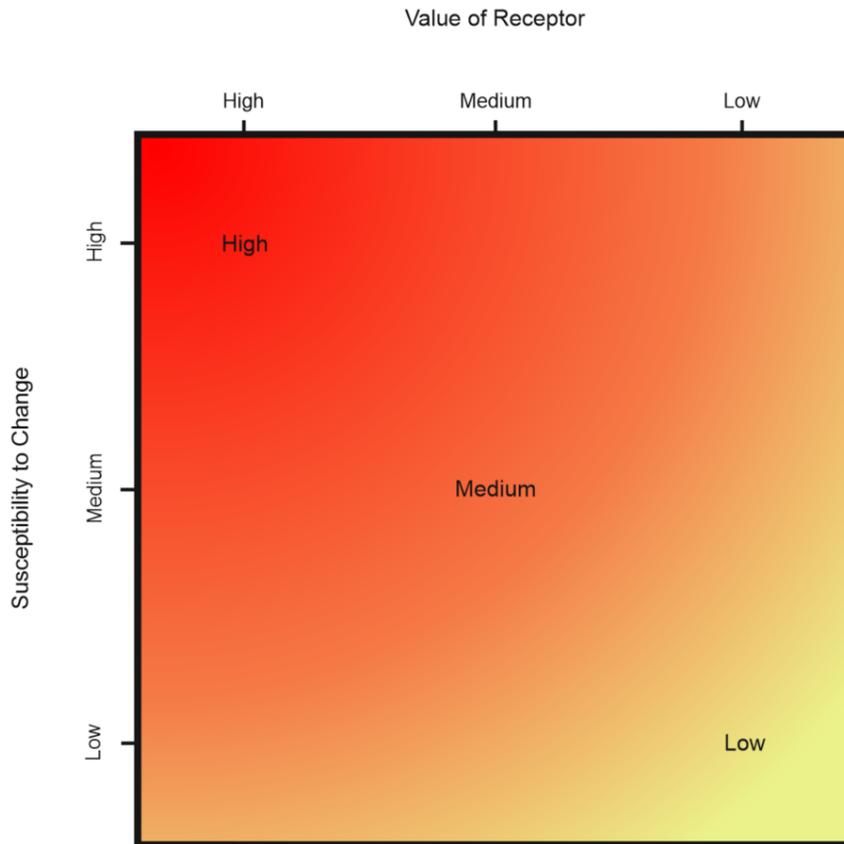


Table 13A-10: Example Levels of Sensitivity defined by Value and Susceptibility of Visual Receptors

| Sensitivity | Criteria |
|-------------|---|
| High | The visual receptor group is highly susceptible to changes in views and visual amenity and relevant views are of high value OR The visual receptor group has a medium level of susceptibility to changes in views and visual amenity and relevant views are of high value |

| Sensitivity | Criteria |
|-------------|---|
| Medium | <p>The visual receptor group is highly susceptible to changes in views and visual amenity and relevant views are of value at the medium level.</p> <p>OR</p> <p>The visual receptor group is highly susceptible to changes in views and visual amenity and relevant views are of value at the low level</p> <p>OR</p> <p>The visual receptor group has a medium level of susceptibility to changes in views and visual amenity and relevant views are of value at the medium level</p> <p>OR</p> <p>The visual receptor group has a low level of susceptibility to changes in views and visual amenity and relevant views are of value at the high level.</p> |
| Low | <p>The visual receptor group has a medium level of susceptibility to changes in views and visual amenity and relevant views are of value at the low level</p> <p>OR</p> <p>The visual receptor group has a low level of susceptibility to changes in views and visual amenity and relevant views are of value at the medium level</p> <p>OR</p> <p>The visual receptor group has a low level of susceptibility to changes in views and visual amenity and relevant views are of value at the low level.</p> |

Magnitude of Visual Change

The magnitude of visual change is established by assessing the size or scale of change, the geographical extent of the area influenced and the duration and potential reversibility of the change.

Size and Scale of Change

The criteria used to assess the size/scale of visual change are as follows and as summarised in the **Table 13A-11** below:

- the scale of the change in the view with respect to the loss or addition of features in the view, changes in its composition, including the proportion of the view occupied by the proposed development and distance of view;
- the degree of contrast or integration of any new features or changes in the landscape with the existing or remaining landscape elements and characteristics in terms of factors such as form, scale and mass, line, height, colour and texture; and
- the nature of the view of the proposed development, for example whether views will be full, partial or glimpses or sequential views while passing through the landscape.

Table 13A-11: Size/Scale of Change

| Category | Criteria |
|--------------------------|--|
| Large visual change | The proposed development will cause a complete or large change in the view, resulting from the loss of important features in or the addition of important new ones, to the extent that this will substantially alter the composition of the view and the visual amenity it offers. |
| Medium visual change | The proposed development will cause a clearly noticeable change in the view, resulting from the loss of features or the addition of new ones, to the extent that this will alter to a moderate degree the composition of the view and the visual amenity it offers. Views may be partial/intermittent. |
| Small visual change | The proposed development will cause a perceptible change in the view, resulting from the loss of features or the addition of new ones, to the extent that this will partially alter the composition of the view and the visual amenity it offers. Views may be partial only. |
| Negligible visual change | The proposed development will cause a barely perceptible change in the view, resulting from the loss of features or the addition of new ones, to the extent that this will barely alter the composition of the view and the visual amenity it offers. Views may be glimpsed only. |
| No change | The proposed development will cause no change to the view. |

Geographical Extent of Change

The geographical extent of the visual change identified at representative viewpoints is assessed by reference to a combination of the Zone of Theoretical Visibility (ZTV), where this has been prepared, and field work, and consideration of the criteria in **Table 13A-12** below. Representative viewpoints are used as 'sample' points to assess the typical change experienced by different groups of visual receptors at different distances and directions from the proposed development. The geographical extent of the visual change is judged for each group of receptors: for example, people using a particular route or public amenity, drawing on the viewpoint assessments, plus information about the distribution of that particular group of people in the Study Area.

The following factors are considered for each representative viewpoint:

- the angle of view in relation to the main activity of the receptor;
- the distance of the viewpoint from the proposed development; and
- the extent of the area over which changes would be visible.

Thus, low levels of change identified at representative viewpoints may be extensive or limited in terms of the geographical area they are apparent from: for example, a view of the proposed development from elevated land may be widely visible from much or all of an accessible area, or may be confined to a small proportion of the area. Similarly, a view from a public footpath may be visible from a single isolated viewpoint, or over a prolonged stretch of the route. Community views may be experienced from a small number of dwellings or affect numerous residential properties.

Table 13A-12: Geographical Extent of Change

| Category | Description |
|------------------------------------|--|
| Large extent of visual change | The proposed development is seen by the group of receptors in many locations across the Study Area or from the majority of a linear route and/or by large numbers of viewers; or the effect on the specific view(s) is extensive. |
| Medium extent of visual change | The proposed development is seen by the group of receptors from a medium number of locations across the Study Area or from a medium part of a linear route and/or by a medium number of viewers; or the effect on the specific view is moderately extensive. |
| Small extent of visual change | The proposed development is seen by the group of receptors at a small number of locations across the Study Area or from only limited sections of a linear route and/or by a small number of viewers; or the effect on a specific view is small. |
| Negligible extent of visual change | The proposed development is either not visible in the Study Area or is seen by the receptor group at only one or two locations or from a very limited section of a linear route and/or by only a very small number of receptors; or the effect on the specific view is barely discernible. |

Duration and Reversibility of Change

The duration of the visual change at viewpoints is categorised in **Table 13A-13** below, which considers whether views will be permanent and irreversible or temporary and reversible. The levels of duration are based on the EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (May 2022).

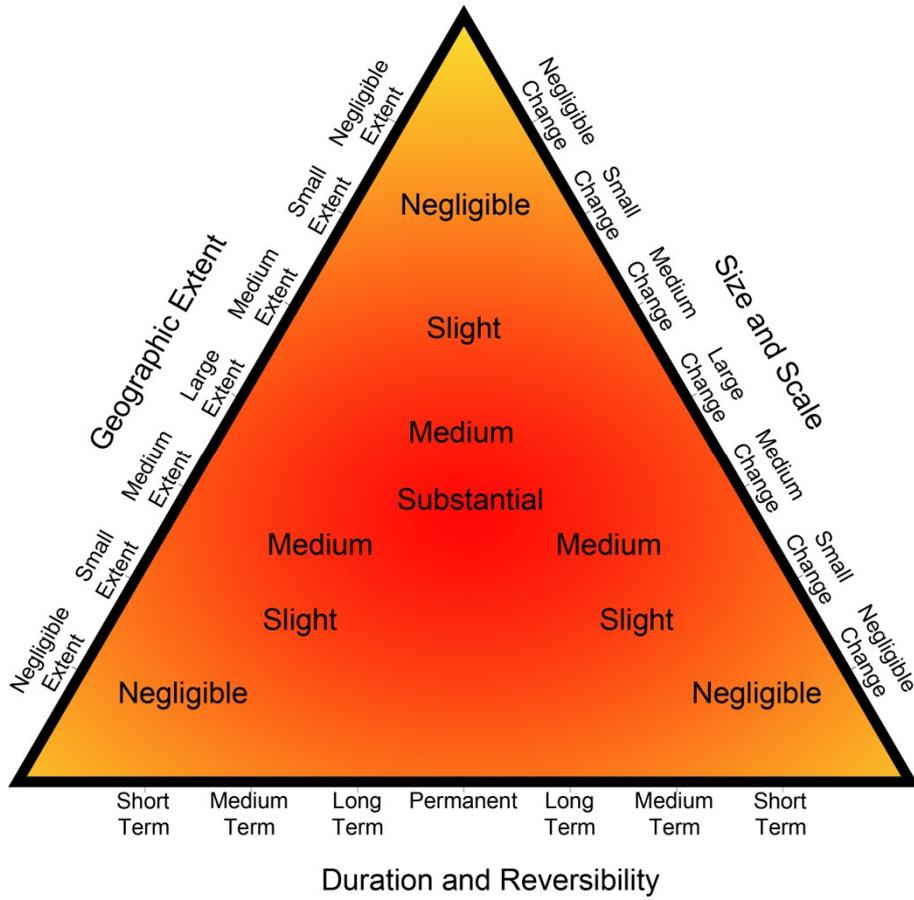
Table 13A-13: Duration and Reversibility

| Category | Description |
|----------------------------------|--|
| Permanent/ Irreversible | Change that will last for over 60 years and is deemed permanent or irreversible. |
| Long-term reversible | Change that will last between 15 and 60 years and is potentially, or theoretically reversible. |
| Medium-term reversible | Change that will last between 7 and 15 years and is wholly or partially reversible. |
| Temporary/ Short-term reversible | Change that will last from 0 to 7 years and is reversible - includes construction effects. |

Deciding on Overall Magnitude of Visual Change

The relationships between the three factors that contribute to assessment of the magnitude of visual effects are illustrated graphically, as a guide, in **Figure 13A-5** below. Various combinations are possible, and the overall magnitude of each effect is judged on merit rather than by formulaic application of the relationships in the diagram.

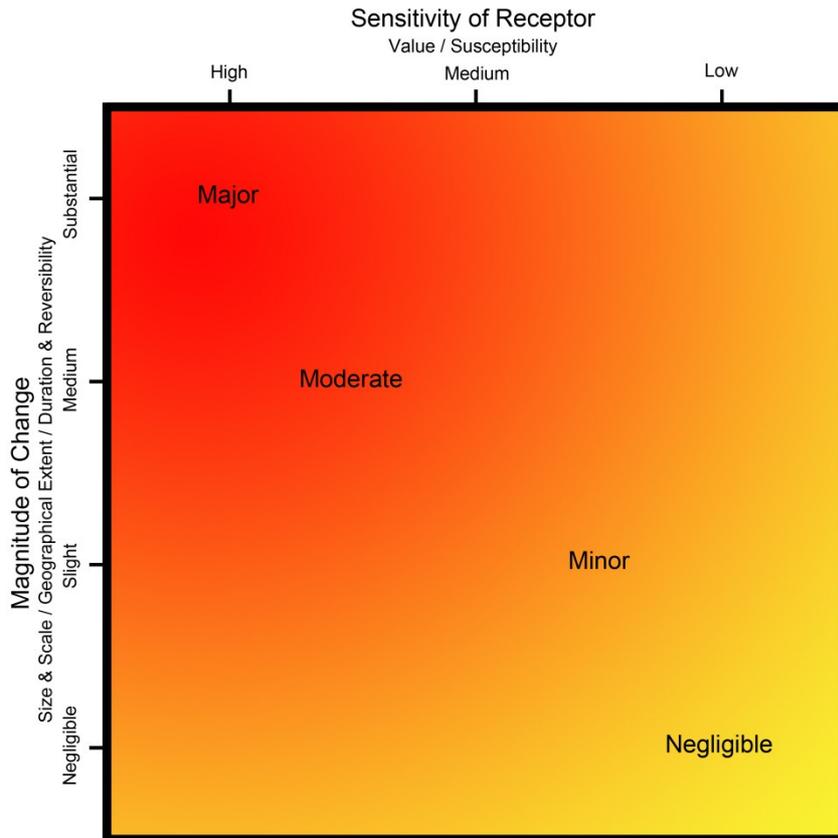
Figure 13A-5: Determining the Magnitude of Visual Change



Assessment of Visual Effects

The assessment of visual effects is defined in terms of the relationship between the sensitivity of the visual receptors and the magnitude of the change. The diagram below (Figure 13A-6) summarises the nature of the relationship, but it is not formulaic and only indicates broad levels of effect. Judgements are made about each visual effect using this diagram as a guide.

Figure 13A-6: Assessment of Visual Effects

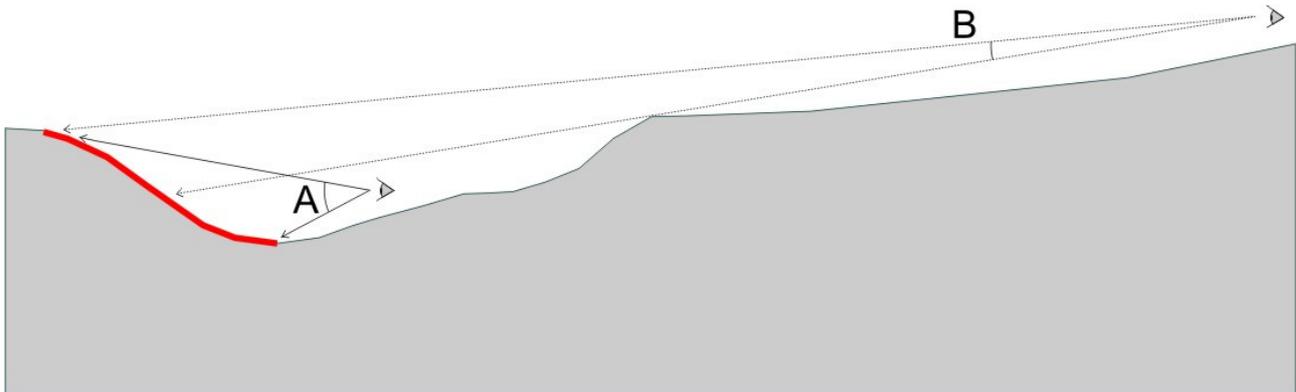


Appendix 13-B – Zone of Theoretical Visibility (ZTV) Methodology

A Zone of Theoretical Visibility (ZTV) Study was conducted for the two proposed tallest stacks (i.e. the Line 1 start-up stack and the Line 2 start-up stack) to help identify areas sensitive to visual impacts. This study used the measurement of the vertical subtended angle for its methodology. This method is explained below and illustrated by **Figure A**, below.

When a Target Area (red) is observed from a Viewpoint (A or B) its apparent height can be measured in the form of degrees, to give a Subtended Vertical Angle. Please note that in the case of the proposed development, the target area is made up from two vertical lines, i.e. the sides of the two proposed start-up stacks.

Figure A:



The use of the Subtended Vertical Angle in formulating a ZTV has the benefit of automatically reducing values to reflect the distance from the Target Area, and partial screening by intervening landforms. Generally, the further the viewpoint is from the Target Area the smaller the Subtended Vertical Angle, reflecting the effect of distance on visual impacts.

Thus, in the example section above Viewpoint A experiences a higher subtended angle due to proximity to the red target area. Viewpoint B has a lower subtended angle due to greater distance from the target area and partial screening by intervening landform.

If the Subtended Vertical Angle is measured from a series of grid points for a particular Target Area, the resultant data can then be used to generate contours. Each contour level representing a certain vertical angle, and thus potential level of visibility.

The subtended vertical angle method of calculating ZTVs using LSS digital terrain modelling software has been proven by field investigation on numerous sites to be an accurate method of predicting areas of potential visibility for on-site investigation.

This computer generated ZTV study was undertaken using a mostly bare earth landform to give a near worst case scenario. In the case of the ZTV calculated for the proposed development, the tall vegetation immediately surrounding the project area and tallest existing buildings within the site were included in the model, to illustrate the existing screening they provide in views from nearby locations. However, built structures (settlements, walls etc) and areas of vegetation (woodlands, scrub and hedgerows) in the wider landscape were not included. These typically reduce the actual visibility of the target area further, compared with what is indicated by the ZTV map (refer to **Figure 13-2**). Therefore, it is necessary to carry out fieldwork to validate the results of the ZTV.

Appendix 13-C – Viewpoint Photography and Photomontage Methodology

Introduction

An integral part of the assessment/appraisal process is often the recording of viewpoint photography and the preparation of visualisations, including photomontages. Such output is valuable in illustrating visual change for assessment purposes and in helping readers to understand the nature of that change.

It is essential that such output is prepared to be technically correct and an accurate representation of that which is illustrated.

The photography and visualisations are prepared with knowledge and understanding of the principles and guidance provided in a number of relevant documents, including:

- Landscape Institute (2019): Advice Note 06/19, Visual Representation of Development Proposals;
- Scottish Natural Heritage (December 2014) Visual Representation of Wind Farms, Version 2.2; and
- The Highland Council (2017) Visualisation Standards for Wind Energy Developments.

Note that not all elements of the above documents are relevant to all developments and a pragmatic and proportionate approach has been taken to illustrate the Proposed Development effectively.

Viewpoints

The viewpoints are chosen to reflect a range of views towards the Proposed Development and the selection process is explained in the assessment/appraisal.

At each viewpoint baseline photography is recorded to allow the analysis of the effects that are predicted to occur as a result of the proposed development. Where appropriate, the assessment/appraisal involves the production of computer generated visualisations/photomontages for a number of viewpoints to illustrate views of the Proposed Development. The viewpoints form an important element of the visual assessment/appraisal and can also be used to inform judgements in relation to the potential effects on landscape/townscape receptors.

Viewpoint Photography

Photography is undertaken through the use of digital single lens reflex (dSLR) camera and a prime lens², with the camera and lens combination being comparable with a 35mm format camera and 50mm focal length lens combination. The camera is mounted on a tripod with a panoramic head in order to obtain a stable platform for single frame and panoramic views. A camera height of approximately 1.5m is used at each location, unless otherwise stated. The position of the tripod is recorded with a handheld GPS device. In addition to recording the location of the viewpoint, observations in regard to time of day, weather, cloud cover, and visibility are made.

² fixed focal length, as opposed to a zoom lens

Following completion of the fieldwork, the photography is reviewed and the clearest images selected for the production of panoramic images. In some cases, limited adjustments are made to the images through the use of Adobe Photoshop software in order to improve appearance of the photography e.g. adjustments to exposure and sharpness. The photography for each viewpoint comprises a panorama created by joining the images in Adobe Photoshop, using cylindrical projection.

Three Dimensional Modelling

A three dimensional model has been prepared for the proposed development and the surrounding area using survey software. This links a model of the proposed development with digital terrain model data for the surrounding landform using Ordnance Survey Ireland grid co-ordinates.

Reference points are selected and positioned in the survey software. These reference points reflect clearly identifiable elements that are visible in the baseline photography. These use of reference points allows verification of the visualisations/photomontages and accurate scaling/positioning of the Proposed Development in relation to baseline components of the view.

Where fully rendered views of the proposed development are produced in 3D modelling software, virtual cameras are positioned in the correct position relative to the development to match the baseline viewpoint photography. The lighting of the view in the 3D model is selected based upon the date, time and weather conditions applicable to the photography. While every effort is undertaken to render the development to account for the prevailing lighting conditions, some adjustment of the rendering and/or photograph is sometimes required to create a suitably realistic impression of the development.

Visualisations

The visualisations/photomontages that form part of the assessment/appraisal are presented in a way that provides a predicted view of the Proposed Development relative to, and within, the surrounding context. The main objective of the visualisation/photomontage process is to assist the assessor in determining the change and resultant effect on the receptors at the viewpoint location.

In the case of photomontages, Adobe Photoshop is used to combine the image of the three-dimensional survey model with the baseline photography using the reference points present in both (as described in the three dimensional modelling step above). The modelled view of the proposed development is then integrated with the photography as a third layer, and matched to the reference points in the survey model and rendered view to accurately position and scale the Proposed Development within the view. The Proposed Development is also placed carefully in relation to foreground and background vegetation to ensure it is depicted in a realistic way.

The visualisations/photomontages are presented in at A3 size for ease of viewing. The visualisations should be used in the field at the viewpoint location to help appreciate the level of effect that is likely to result from the Proposed Development.