

REPORT

Boston Alternative Energy Facility – Preliminary Environmental Information Report

Appendix 9.1 Landscape and Visual Impact Assessment
Methodology

Client: Alternative Use Boston Projects Ltd

Reference: PB6934-RHD-01-ZZ-RP-N-2009_A9.1

Revision: 0.1/Final

Date: 17 June 2019



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Document title: Boston Alternative Energy Facility – Preliminary Environmental Information Report
Document short title: landscape and visual impact assessment methodology
Reference: PB6934-RHD-01-ZZ-RP-N-2009_A9.1
Revision: 0.1/Final
Date: 17 June 2019
Project name: Boston Alternative Energy Facility
Project number: PB6934-RHD-01-ZZ-RP-N-2009_A9.1
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Date / initials: GB 14/06/2019

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Date / initials: GB 17/06/2019

Classification

Project Related



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A9.1 Introduction

- A9.1.1 The purpose of the landscape and visual assessment (LVIA) process is to identify the potential effects of a proposed development on the landscape and visual amenity resource of the area in which the development is located.
- A9.1.2 LVIA is carried out formally as part of the Environmental Impact Assessment (EIA) process.
- A9.1.3 The key purpose of EIA Directives and legislation is to ensure that *likely significant effects* on the environment are taken into account during the development control process. This methodology has been prepared to identify *likely significant landscape and visual effects* to inform the EIA and decision-making process, but also to identify lesser effects, to help provide a rounded picture of the effect a development proposal may have on its landscape and visual context.

A9.2 Guidance and Approach

- A9.2.1 This assessment methodology has been developed from the general guidance given in the Guidelines for Landscape and Visual Impact Assessment (GLVIA), Third Edition Landscape Institute & Institute of Environmental Management and Assessment 2013.
- A9.2.2 It should be noted that GLVIA3 does not provide a prescriptive LVIA methodology and relies on practitioners to develop their own specific methodologies based on the characteristics of the development proposal at hand and the landscape in which it is located, combined with professional judgement and experience. This methodology sets out the general approach to the LVIA process adopted by Estell Warren Ltd. Project specific methodology (as described in **Section A9.6** below) is to be defined based on the nature of the development, the characteristics of the landscape setting and the outcome of discussions with the planning authority and interested parties.
- A9.2.3 EIA Regulations¹ specify that an assessment of likely significant effects should cover certain aspects of a proposed development, these are set out in **Table A9.1.1** below and cross referenced to the LVIA process for clarity:

¹ Schedule 4, Part 1 of The Town and Country Planning (Environmental Impact Assessment) Regulations 2011

Table A9.1.1 Relationship Between EIA Regulations and LVIA Process

EIA Aspects	Interpretation of EIA Aspects Within LVIA Process / Reporting
Direct effects	Direct physical effects of a proposal should be described in the LVIA, including quantities where appropriate (for example, loss of Xha broadleaved woodland).
Indirect and secondary effects	<p>Indirect effects include perceptual and visual effects on landscape character and visual effects on specific receptors.</p> <p>Secondary effects may include further LVIA effects arising from related development, which may be remote from the development site itself (for example, borrow pits, requirement for additional permanent power supplies, off site drainage improvements).</p>
Cumulative effects	The LVIA process should identify, in consultation with the planning authority, whether cumulative effects are likely to arise or not, based on the nature of the development proposal and its context. If potential for cumulative LVIA effects exists the assessment should address this issue.
Whether effects are likely to be short, medium or long term	The LVIA process should identify effects during various stages of a project including the construction stage and/or phased implementation.
Whether effects are temporary or permanent	<p>In relation to the above, the LVIA process should identify whether effects are temporary or permanent (eg are they reversible or irreversible).</p> <p>For certain developments LVIA effects at decommissioning stage should also be assessed.</p>
Whether effects are positive or negative	This is interpreted as either a <i>beneficial</i> (positive) or <i>adverse</i> (negative) effect in LVIA terms.

A9.3 Overview of Assessment Process

A9.3.1 The assessment process comprises:

- Establishment of the *landscape* baseline condition through identification of physical and perceptual landscape characteristics within the site and the surrounding study area (in the form of landscape character assessment) and identification of landscape designations or special interests (including related planning policies);
- Establishment of the *visual* baseline condition through identification and analysis of the existing visual resource that may be affected including the extent and nature of principle views to the proposed development from visual receptors in the study area;
- Identification of landscape and visual receptors to be assessed and assignation of their sensitivity to change;

- Assessment of the occurrence, magnitude and significance of the effects of the proposed development on landscape and visual receptors, taking into account embedded mitigation measures;
- Iterative development of design changes and/or additional mitigation measures to avoid, reduce or offset identified adverse effects;
- Re-assessment of effects, on the assumption of established mitigation measures being in place, to identify any residual environmental effects.

A9.3.2 Two categories of effects are considered:

- Landscape effects relate to changes in the physical fabric, and/or character of the landscape. Landscape effects may include direct impact upon specific physical landscape elements (for example loss of distinctive topography, woodland or hedgerows) or effects on wider landscape character (for example available views of the development, lighting or sound effects, which may affect how the wider landscape is perceived). Effects on areas of designated landscape (for example National Parks) are also included in this category;
- Visual effects relate to changes that would occur in the composition of view character as a result of implementing a development. View receptors include residents, users of public rights of way, of roads and of recreational facilities. Effects in views from cultural heritage features (for example World Heritage Sites, Registered Parks and Gardens, Scheduled Monuments, other sites of archaeological interest, Listed Buildings and Conservation Areas) may also be considered within this category where they are known to be of tourist or community importance.

A9.3.3 The key part of the assessment process is the identification of the *significance* of landscape and visual effects. In identifying *significance* a number of factors are considered, including the *sensitivity* of the affected landscape or visual receptor to change, the *magnitude* of the effect and whether effects are beneficial or adverse.

A9.3.4 The relative *sensitivity* to change of the landscape and visual resource may vary, for example; a small-scale rural landscape with historic features may be more sensitive to change than an area of undulating topography with enlarged field patterns or an urban fringe landscape which has been modified by man-made detractors. Residents and users of public rights of way would normally be

considered more sensitive to change than drivers, given the relative speed at which the observer moves and the transitory nature of views from roads.

A9.3.5 *The magnitude* of an effect depends on the degree to which physical landscape change, landscape character change or change in view character would occur as a result of the development being implemented.

A9.3.6 The *duration* and *reversibility* of effects is also taken into account.

A9.3.7 For physical landscape features the assessment of magnitude takes into account whether the change is considered to be irreversible or reversible over the short (0-5 years), medium (5-15 years) or long term (15 years plus). For example, removal of ancient semi-natural woodland may be considered irreversible whereas removal of recently planted woodland may be reversible over the short to medium term.

A9.3.8 For landscape character and visual receptors the duration and reversibility of a development is identified and noted separately, with the assessment setting out different magnitude (and significance) results for different distinct periods or stages of a development. For example, the effects of a mineral extraction development would be assessed separately for the operational and post operational stages, to allow a clear understanding of the different changes on the landscape or within views over time, including the effects that may be associated with landscape mitigation measures. Timescales for identified LVIA effects should correspond with those set out in the ES for the development as a whole.

A9.4 Extent of the Study Area

A9.4.1 The extent of study area used for the LVIA process should be based on the type of development being proposed and the likelihood of potential significant effects at distance. This may be defined by standoffs from the development site boundary (for example 1 - 3km distances for minerals or built development projects, or a 5km+ distance for overhead transmission line or wind farm development, depending on location), through establishing the extent of landscape character areas directly or indirectly affected by a proposal, or through the use of Zone of Theoretical Visibility (ZTV) mapping (see further

below). Whichever approach is adopted, the extent of study area should be agreed with the planning authority at the outset of the assessment process.

A9.5 Representative Viewpoints

A9.5.1 GLVIA3 (at paragraphs 6.16 to 6.24) discusses the use of representative viewpoints as part of the LVIA process and identifies that these should be selected through discussion with the competent authority and other interested parties. Selection should also be informed by desk research, ZTV analysis and fieldwork with the aim of picking up viewpoint locations *'reasonable and necessary to cover the likely significant effects'* (paragraph 6.21). Also, when selecting viewpoints, *'emphasis must always be on proportionality in relation to the scale and nature of the development proposal and its likely significant effects,'* (paragraph 6.21).

A9.6 Zone of Theoretical Visibility

A9.6.1 ZTV mapping is a digital process which is used to generate a theoretical visual envelope arising from a development, or part of a development, based on a digital terrain model (DTM). This approach generates a 'worst case' potential extent of visual influence that could arise from a proposal on the basis that the DTM does not take into account intervening built form, woody vegetation or minor topographical features, which would otherwise combine in the real world to control the availability of views towards a site. In addition to showing where a development may be visible from, the process is also useful in showing where it is not visible from, enabling assessment focus to be directed to areas with the highest potential for visual or landscape character effects. The technique is of most relevance in open upland landscapes, where intervening features are generally absent. Where woodland blocks are present within a study area these may be modelled into the DTM although it should be recognised that ascribed woodland heights will be estimated.

A9.6.2 ZTV mapping may be used to identify the different and / or overlapping visual influences that could arise from different components of a development, from different stages of a development or from cumulative effects associated with other development in the same area.

A9.6.3 Estell Warren use LSS Terrain Modelling software for the preparation of ZTV maps and set the observer eye height to 1.7m above ground level. Large scale

DTMs are prepared from a combination of Ordnance Survey Terrain 5 and Terrain 50 data as follows:

- 0-3km from site boundary – Terrain 5 data;
- 3km+ from site boundary – Terrain 50 data.

A9.6.4 The above approach is used to provide a greater level of terrain accuracy close to a site whilst working within the computational limits of the software. The model is set to take account of earth curvature. Development model points (from which the ZTV is generated) should be set to the worst case height and extent positions with single or multi-point modelling being used depending on the scale of the development.

A9.6.5 ZTV mapping may be used to identify the simple zone of theoretical visibility or may be used to identify how much of an observer's horizontal or vertical field of view would potentially be occupied by a development proposal. Similarly, a count of objects or assessment of the extent of visibility of different parts of a development component may be analysed. In all of these cases specific ZTV analysis methodology should be agreed with the planning authority.

A9.7 Project-Specific Methodology

A9.7.1 Certain aspects of LVIA methodology should be defined for each project, based on the characteristics of the proposed development and its landscape setting. They should be agreed with the planning authority and / or key stakeholders as part of the assessment process:

- Extent of the study area;
- Representative viewpoint locations;
- Determination of landscape sensitivity;
- Determination of visual receptor sensitivity (where different to the general sensitivity ranking identified in this methodology);
- Use of ZTV mapping (to determine whether basic ZTV mapping or specialised mapping should be used and whether different ZTV should be prepared for different development components or stages of the project);
- Identification of the potential for cumulative effects and agree the extent of other development to be considered in the assessment;
- Agreement of photomontage view positions and development stages to be modelled and illustrated; and

- Agreement of average vegetation growth rates to be used in photomontage views and for the purposes of assessing the effectiveness of mitigation measures over time.

A9.8 Assessment Limitations

A9.8.1 Site assessment is undertaken by a qualified landscape architect using publicly accessible viewpoints. Assessment of residential property and other non-accessible receptors is estimated based on effects identified from the closest publicly accessible areas.

A9.8.2 The assessment of visual effects is based on views from ground floor areas, including gardens for residential property.

A9.8.3 Visual containment and screening provided by vegetation cover does not remain constant throughout the year. The assessment of effects is based on an estimate of worst case winter views, where deciduous woody species have lost their leaves and a filtering branch structure remains. Where possible, depending on assessment timescale, a combination of in-leaf and out of leaf photographs will be taken and included within the LVIA report.

Assessment of Landscape Effects

A9.8.4 The GLVIA states (at paragraph 5.1):

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. (LI & IEMA, 2013)

A9.8.5 The landscape baseline should be established using existing Landscape Character Assessment (LCA) studies (where available, of relevant scale and up to date) or additional/ new LCA should be undertaken in accordance with current guidelines to establish Landscape Character Areas within the study area. Where existing LCA information is to be used a judgement should be made as to accuracy and suitability for the purposes of LVIA; for example, are key characteristics representative of what is seen on the ground? Are character area boundaries accurate and consistent?

A9.8.6 Landscape receptors may include Landscape Character Areas, specific Landscape Types within the Character Areas, and international, national or locally designated areas and features (for example National Parks, Areas of

Outstanding Natural Beauty, Special Landscape Areas and Areas of High/ Great Landscape Value). The GLVIA identifies that within the overall framework of LCA and landscape designations more specific landscape receptors, or components, may be identified such as *overall character and key characteristics, individual elements or features, and specific aesthetic or perceptual aspects*. A key part of the LVIA process is to establish which range of landscape receptors are likely to be affected by a proposed development before taking them forward for assessment.

A9.8.7 The *sensitivity* of identified landscape receptors can be derived from a judgement of the *value* attached to a landscape and its *susceptibility* to the specific change associated with the type of development being assessed (see GLVIA Figure 5.1 and paragraphs 5.39 to 5.47). It should be noted that the sensitivity of a landscape receptor to the type of development being assessed may be different to the inherent sensitivity that may be identified in general LCA or other sensitivity studies.

Determination of Landscape Receptor Value

A9.8.8 As noted at paragraph 5.45 of the GLVIA the value of landscape receptors will, to a degree, reflect landscape designations, but may be moderated by consideration of the range of factors set out in Box 5.1 of the GLVIA. In the same vein a non-designated landscape may be given a higher value based on consideration of the Box 5.1 factors.

A9.8.9 The following approach is used to identify landscape value:

- Identify any designations assigned to the landscape and give an initial value according to the level of designation;
- Moderate the initial value based on an assessment of criteria given in Box 5.1 to give a final value.

A9.8.10 **Table A9.1.2** sets out typical criteria for assessing landscape value:

Table A9.1.2 Assessment of Landscape Receptor Value

Low	Medium	High
Non-designated landscapes.	Locally designated landscapes.	Internationally and nationally designated landscapes and landscape features.
Consideration of other value criteria (assessed on a project by project basis with examples given below)		
<i>Condition/ quality</i>		
A landscape with no or few areas intact and/or in poor condition.	A landscape with some areas that are intact and/or in reasonable condition.	A landscape with most areas intact and/or in good condition.
<i>Scenic quality</i>		
A landscape of little or no aesthetic appeal.	A landscape of some aesthetic appeal.	A landscape of high aesthetic appeal.
<i>Rarity and representativeness</i>		
A landscape which does not contain rare landscape types or features.	A landscape which contains distinct but not rare landscape types or features.	A landscape which contains one or more rare landscape types or features.
<i>Conservation interests</i>		
A landscape with no or limited cultural and/or nature conservation content.	A landscape with some cultural and/or nature conservation content.	A landscape with rich cultural and/or nature conservation content.
<i>Recreation value</i>		
A landscape with no or limited contribution to recreational experience.	A landscape which provides some contribution to recreational experience.	A distinct landscape which forms a strong contribution to recreational experience.
<i>Perceptual aspects</i>		
A landscape with prominent detractors, probably part of the key characteristics.	A landscape with detractors that also retains some perceptual values.	A wild, tranquil or unspoilt landscape without noticeable detractors.
<i>Cultural associations</i>		
A landscape without recorded associations.	A landscape with some and/or moderately valued associations.	A landscape of rich and/or highly valued associations.
Overall judgement of landscape value		
Low value – receptor poorly reflects high and medium value criteria above.	Medium value – receptor moderately reflects high and medium value criteria above.	High value – receptor strongly reflects high and medium value criteria above.

A9.8.11 Value judgements will be recorded for each landscape receptor using the above format.

Determination of susceptibility

A9.8.12 The susceptibility of a landscape receptor to change is assessed based on the broad criteria below in combination with consideration of the nature of the development proposal. **Table A9.1.3** is shown as an example, criteria may change depending on project type. Susceptibility assessment will distinguish between receptors which are expected to be directly (eg. physically) or indirectly (eg. visually, aurally) affected, to ensure that the final judgement on sensitivity reflects the likely effects of a scheme rather than overall landscape sensitivity to change.

Table A9.1.3 Assessment of Landscape Receptor Susceptibility

Less susceptible to change	Moderately susceptible to change	Highly susceptible to change
Pattern, complexity and physical susceptibility to change		
A simple, monotonous and/or degraded landscape with common/ indistinct features and minimal variation in landscape pattern.	A landscape with mostly intact pattern and/or with a degree of complexity and with features mostly in reasonable condition.	A strongly patterned/ textured or a simple but distinctive landscape and/or with high value features and essentially intact.
Visual susceptibility to change		
A very enclosed landscape which contains or strongly filters views, with an absence of visual landmarks and a lack of intervisibility with designated landscapes.	A partially enclosed landscape with some visual containment and filtering, possible limited intervisibility with visual landmarks and designated landscapes.	An open or exposed landscape with extensive intervisibility and no or very limited visual filtering or enclosure. Prominent visual landmarks may be present, and intervisibility with designated landscapes may occur.
Experiential susceptibility		
A landscape with prominent visual and/or aural intrusion and close relationship with large scale built development/ infrastructure. A landscape which contains many light sources and essentially suffers from light pollution.	A partially tranquil landscape with limited visual and/or aural intrusion, some relationship with built development/ infrastructure may be present. A landscape which contains some light sources.	A very tranquil, wild or remote landscape with little or no sense of visual or aural intrusion. A landscape which contains very few light sources and provides dark skies.

Sensitivity

A9.8.13 The general relationship between value, susceptibility and sensitivity is shown in **Plate A9.1.1**.

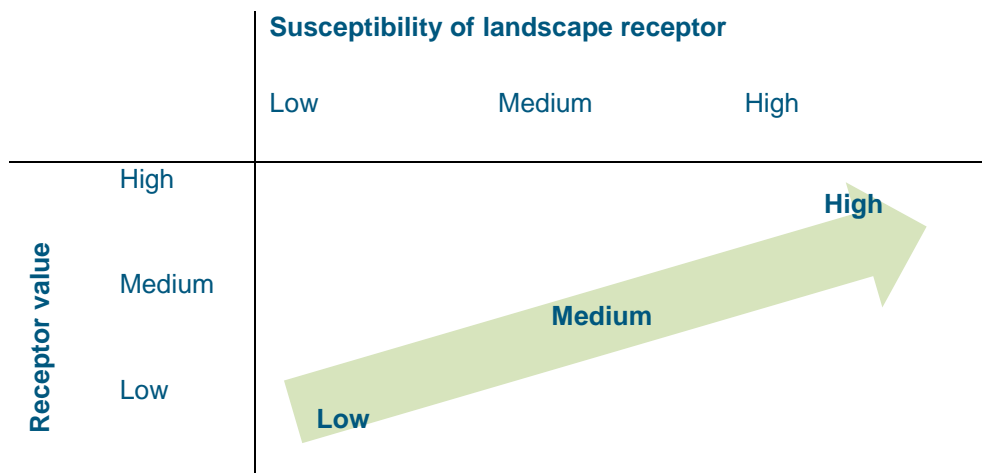


Plate A9.1.1 Assessment of Landscape Sensitivity

A9.8.14 Determination of sensitivity is based on professional judgement, however, high value/ high susceptibility receptors are likely to be highly sensitive to change, with lower value and/or low susceptibility receptors being likely to be of low sensitivity to change. A three point scale is used to define landscape receptor sensitivity:

- High
- Medium
- Low

Magnitude

A9.8.15 The magnitude of change arising from a development on landscape receptors is identified using professional judgement based on the broad criteria in **Table A9.1.4**.

Table A9.1.4 Assessment of Magnitude of Change for Landscape Receptors

Magnitude	Typical Criteria for Landscape Receptors
High	Major removal or addition of landscape features or removal of localised but unusual or distinctive landscape features and/or addition of new conspicuous features and elements which may alter the character of the landscape (with uncharacteristic features being negative and characteristic features being positive). Physical loss of landscape features that are not replaceable or are replaceable only in the long term.
Medium	Moderate removal or addition of landscape features and/or addition of new noticeable features and elements which would be clearly visible but would not alter the overall character of the landscape (with uncharacteristic features being negative and characteristic features being positive). Physical loss of landscape features that are replaceable in the medium term.
Low	Minor removal or addition of landscape features and/or addition of new discrete features and elements which would be perceptible within but would not alter the overall character of the landscape (with uncharacteristic features being negative and characteristic features being positive). Physical loss of landscape features that are readily replaceable in the short term.
Negligible	Barely perceptible removal or addition of landscape features would occur and the development would be barely perceptible in visual/ character terms.

A9.8.16 Where magnitude of change is considered to fall between high, medium and low categories, intermediate categories of *low medium* and *medium high* will be introduced.

Beneficial or Adverse Change

A9.8.17 Magnitude is also assessed as being either a beneficial or adverse change where:

- For beneficial change the proposed development, or part of it, would appear in keeping with existing landscape character and would make a positive visual and/or physical contribution to key characteristics. Removal of uncharacteristic features would also be a beneficial change; or
- For adverse change the proposed development, or part of it, would be perceived as an alien or intrusive component in the context of existing landscape character and would have a negative visual and/ or physical effect on key characteristics.

Perceptual Effects

- A9.8.18 Certain landscape characteristics may relate to perceptual qualities, for example tranquillity, wildness, sounds, human activities or the presence and movement of wildlife.
- A9.8.19 Where appropriate, an assessment of effects on perceptual landscape qualities should be undertaken. Available quantitative evidence from other EIA disciplines for example noise, lighting, transport or ecology assessments, may be used to help inform an understanding of the degree of potential change to perceptual qualities. It should be recognised, however, that LVIA commentary on effects on perceptual characteristics is likely to remain subjective.

A9.9 Assessment of Visual Effects

- A9.9.1 For *visual receptors* the criteria adopted for classification of sensitivity and magnitude are as follows:

Sensitivity

- A9.9.2 A visual receptor is a human user of the landscape. The practice has adopted the principle that the sensitivity of each type of visual receptor is inherent to the nature of the activity they are undertaking rather than the view itself. For example, all users of public rights of way are considered highly sensitive to a change in view, whether using a well-loved urban edge footpath or a remote mountain pass in a National Park. Judgements relating to the 'value' of a view may be taken into account in the assessment of magnitude of change rather than assessment of sensitivity.
- A9.9.3 Exceptions to the above principle include road users. Drivers on faster roads (eg 'A' and 'B' class roads and motorways) are considered to be of lower sensitivity than those using minor country lanes, where the purpose of the journey may include an element of appreciating the surroundings, rather than simply moving from A to B.
- A9.9.4 Effects in views from cultural heritage sites are included where appropriate, for example when they are known to be used by tourists, form part of the overall tourist experience (for example where they are a noticeable contributor to the key characteristics of a place) or where they form a local community feature. Effects on the setting of cultural heritage features are not included in this

assessment and would be covered separately under the Cultural Heritage section of the ES where appropriate.

Table A9.1.5 Visual Receptor Sensitivity

Sensitivity	Typical Criteria for Visual Receptors
High	Users of residential properties, public rights of way, named viewpoints and scenic roads or railways. Users of passive recreational areas. Users of cultural heritage features including World Heritage Sites, Registered Parks and Gardens, Scheduled Monuments, Listed Buildings and Conservation Areas where they are known to be tourist destinations or places used by local communities.
Medium	Users of offices, play areas, sporting and outdoor active recreational facilities and rural roads.
Low	Users of industrial and employment areas, users of main roads, motorways and rail network.

Magnitude

A9.9.5 The magnitude of a visual effect will be dependent upon a number of factors; the character and extent of the existing view, the distance from receptor to development, changes in the view composition and proportion of the view affected by the proposed development. Identification of magnitude is based on professional judgement using the broad criteria in **Table A9.1.6**.

Table A9.1.6 Assessment of Magnitude for Change for Visual Receptors

Magnitude	Typical Criteria for Visual Receptors
High	The proposed development, or part of it, would become the dominant feature or focal point of the view.
Medium	The proposed development, or part of it, would form a noticeable feature or element of the view.
Low	The proposed development, or part of it, would be perceptible but would not alter the overall balance of features and elements that comprise the existing view.
Negligible	Only a very small part of the proposed development would be discernible, or the development is at such a distance that it would form a barely noticeable feature or element of the view.

A9.9.6 Where magnitude of change is considered to fall between high, medium and low categories, intermediate categories of *low medium* and *medium high* will be introduced.

Beneficial or Adverse Change

A9.9.7 Magnitude is assessed as being either a beneficial or adverse change where:

- For beneficial change the proposed development, or part of it, would be perceived as a positive addition in the context of existing view character; or

- For adverse change the proposed development, or part of it, would be perceived as an alien or intrusive component in the context of existing view character.

View Value

A9.9.8 Where a view is recognised as being of special value, for example in relation to a scenic drive, a named panoramic viewpoint or distinct views which feature in literature or art, this would be recorded and taken into account during the assessment of magnitude.

A9.10 Significance of Landscape and Visual Effects

A9.10.1 The *significance* of an effect is dependent on the *sensitivity* of a landscape resource or visual receptor and the *magnitude* of the change. The significance of an effect can be determined using the indicative matrix as shown in **Table A9.1.7**.

Table A9.1.7 Indicative Assessment Matrix

Magnitude of change	Sensitivity of receptor		
	Low	Medium	High
High	Moderate effect	Moderate major effect	Major effect
Medium high	Minor moderate effect	Moderate effect	Moderate major effect
Medium	Minor effect	Minor moderate effect	Moderate effect
Low medium	Minor negligible effect	Minor effect	Minor moderate effect
Low	Negligible effect	Minor negligible effect	Minor effect
Negligible	Negligible effect	Negligible effect	Minor negligible effect

A9.10.2 Professional judgement and experience is used to identify levels of significance of effect for each receptor with the outcome being reported on a seven point scale:

- Major
- Moderate major
- Moderate
- Minor moderate
- Minor

- Minor negligible
- Negligible

A9.10.3 The significance of effects can generally be defined as shown in **Table A9.1.8**. The intermediary categories of *minor negligible*, *minor moderate* and *moderate major* will be used where the significance of effect is considered to fall between the broad definitions outlined below.

Table A9.1.8 Definition of Significance Scale

Criteria	Description
Major	Large scale changes in landscape or visual conditions, affecting high sensitivity receptors.
Moderate	Noticeable changes in landscape or visual conditions, likely to be affecting high or medium sensitivity receptors.
Minor	Small changes in landscape or visual conditions, affecting any receptors.
Negligible	Insignificant changes in landscape or visual conditions, affecting any receptors.

A9.10.4 For the purposes of this assessment **major**, **moderate major** and **moderate** effects may be considered to be likely significant effects in terms of EIA Regulations.

A9.10.5 The identified *significance* of an effect carries forward the **beneficial** or **adverse** nature of the effect identified in the assessment of *magnitude* of impact.

A9.10.6 Where an effect is not expected to change the baseline condition, or results in a change that is neither beneficial or adverse, it is considered to be **neutral**.

A9.11 Duration and Permanency of Effects, Assessment of Mitigation Measures and Residual Effects

A9.11.1 A development may have different effects on landscape and visual receptors at different points in time. For example, construction effects may be different to operational effects, or a project may be built in discrete phases.

A9.11.2 The assessment process should identify and record the effects on landscape and visual receptors at appropriate stages in the life of a development and state

whether these effects are temporary or permanent and over which timescales they would occur.

A9.11.3 For physical loss of landscape features the potential reversibility (or irreversibility) of the effect is taken into account in the assessment of magnitude of change. Where reversible effects occur commentary should also be provided on the timescales likely to be involved in re-establishing the feature (short term 0-5 years, medium term 5-15 years or long term 15 years plus). For landscape character and visual effects duration and permanency are taken into account through the assessment of the scheme at distinct stages, with key relationships being drawn out in supporting text.

A9.11.4 Embedded mitigation measures are taken into account as part of the initial assessment of effects. The longer term effect of mitigation measures, for example planting works, is identified separately by assessing subsequent phases and/or the long term residual effects of a scheme. Where a project involves the planned long-term removal of development features, as may occur in renewable energy schemes for example, this would also be taken into account during the assessment of residual effects.

A9.12 Cumulative Effects

A9.12.1 The 2002 edition of the GLVIA provides a definition of cumulative landscape and visual effects as those that:

‘result from additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments (associated with or separate to it), or actions that occurred in the past, present or are likely to occur in the foreseeable future.’

A9.12.2 Discussions with the planning authority and key stakeholders should be undertaken to establish whether cumulative likely significant effects could arise from landscape and visual changes associated with the development proposal. ‘Actions likely to occur in the foreseeable future’ should be interpreted as live or approved planning applications.

A9.12.3 If potential for likely significant cumulative effects is identified, the range and nature of other projects to be considered should be established and the range of potential physical, character and visual effects should be identified and assessed against the baseline resource. In practice, cumulative LVIA effects are most likely to arise from intervisibility of development features. ZTV mapping will be used as an initial means of establishing intervisibility between the proposed

scheme and cumulative development features, supported by fieldwork to confirm likely effects on the ground. The extent of study area considered for cumulative effects should be based on the ZTV for the development proposal itself.

A9.13 Iterative EIA Process and Mitigation Design

A9.13.1 EIA and project development activities are normally parallel processes. The outcome of EIA studies should feed back into the design process to ensure environmental factors are taken account of, with the overall aim of avoiding adverse environmental effects in the first instance or reducing unavoidable impacts to acceptable levels.

A9.13.2 Based on the initial findings of the LVIA process design changes and/or landscape measures may be proposed to help integrate a development into its landscape setting and to mitigate any adverse landscape or visual effects that have been identified. The LVIA should record this process and identify which measures have been incorporated into a scheme.

A9.14 Photomontage Technique

A9.14.1 Photomontages may be prepared to illustrate the effect of a proposed scheme within an existing scene. Photomontages may be used to illustrate the effects of a development proposal at key stages in its life, for example:

- Existing view (baseline);
- Construction stage (possibly split into separate phases of construction where distinct changes occur);
- Completed scheme at Year 1 (including mitigation);
- Completed scheme at Year 15 (to demonstrate the possible growth effects of landscape mitigation measures);
- Completed scheme at decommissioning stage.

A9.14.2 For each project, however, the stages of a development to be illustrated in photomontages would be agreed with the planning authority and would be dependent on the nature of the development and/or landscape setting.

A9.14.3 Methodology for photomontage production is based on the Scottish Natural Heritage publication '*Visual Representation of Wind Farms*' (Version 2.1, December 2014). The process can be summarised as follows:

- Agree representative photomontage locations with the planning authority and/or key stakeholders;

- Undertake site photography using full format DSLR with 50mm prime lens, taking a single frame shot at a fixed height above ground level, centred on the development site and/or a panorama (to be digitally stitched together) and recording viewpoint location in longitude, latitude and elevation (X, Y and Z) co-ordinates using a hand held GPS device;
- Prepare digital 3D model of the proposed development with the model set to real world co-ordinates;
- Render the proposed development using a virtual camera location based on the X, Y and Z co-ordinates taken in the field;
- Insert the development render into the baseline digital photograph using industry standard software;
- Undertake photo editing of the development render and baseline digital photograph (for example to remove existing features or add mitigation measures) to create a realistic impression within the digital photograph;
- Render the final photograph and present in graphic format at 260mm high by 820mm wide.

A9.14.4 As an additional step in the process it can be useful to provide the planning authority and key stakeholders with 'schematic' photomontages to illustrate the nature of a development in a simple modelled form within the baseline photograph rather than in full rendered/ photo real format.