

APPENDIX 5.1 LANDSCAPE AND VISUAL ASSESSMENT METHODOLOGY

5.1.1 This section sets out the methodology used to carry out the Landscape and Visual Impact Assessment (LVIA). Further information on methodology is provided below at Annex 5.1: Method for Assessing Landscape Character Effects.

Guidance

5.1.2 As a matter of best practice the assessment has been undertaken in accordance with the relevant guidance on landscape and visual assessment contained in the following publications:

- Landscape Institute and Institute of Environmental Management and Assessment (2002) 'Guidelines for Landscape and Visual Impact Assessment 2nd Edition'.
- Countryside Agency and Scottish Natural Heritage (2002) 'Landscape Character Assessment – Guidance for England and Scotland.'
- Natural England (2009) 'Assessing the Environmental Capacity for On-Shore Wind Energy Development' – Consultation Draft
- Natural England (2010) 'Making space for renewable energy: assessing on-shore wind energy development'
- Scottish Natural Heritage (2001) 'Best Practice Guidance on Assessment of Windfarms and Small Scale Hydro-electric Schemes'
- University of Newcastle for Scottish Natural Heritage (2002) 'Visual Assessment of Windfarms: Best Practice'
- Scottish Natural Heritage (2009) 'Siting and Designing Windfarms in the Landscape: Version 1
- Department of Trade and Industry and ETSU (2000) 'Cumulative Effect of Wind Turbines'
- Scottish Natural Heritage (2005) 'Cumulative Effect of Windfarms' Version 2
- Entec (for Dept of BERR) (2008) 'Review of Guidance on the Assessment of Cumulative Impacts on Onshore Windfarms'
- Scottish Natural Heritage (2009) 'Assessing the Cumulative Effect of Onshore Wind Energy Developments' Version 3 – Draft for Consultation

Scoping and Consultations

5.1.3 Pre-application consultation was carried out with both North Kesteven District Council and Boston District Council to clarify sensitive receptors and representative viewpoints for photomontages and other visualisations. It is understood that this LVIA addresses the relevant landscape and visual impacts as discussed with the local authority at the pre-application consultations stage.

Baseline / Assessment Year and Cumulative Effects

5.1.4 The baseline for EIA purposes is taken as being the existing situation in Spring 2011. The baseline includes existing and consented windfarms, in addition to those for which detailed planning applications have already been submitted. Consequently, the cumulative assessment is based on the existing situation plus development 'in planning' at the time of submission.

Nature and Scope of Effects

5.1.5 The landscape and visual resource of an area can be affected both directly and indirectly. Visual impacts are always direct because when an object is not in view by implication there can be no impact; impacts on visual amenity also depend on visibility and are therefore also direct. Landscape impacts on the other hand can be either direct or indirect. Change which affects onsite physical features (ie. vegetation, buildings and landform), or the character area / unit in which the site is located, is a direct landscape impact, whereas an impact arising on the character of surrounding landscape character areas / units is indirect. It is assumed that indirect impacts will be intrinsically less significant than direct ones.

5.1.6 In summary landscape and visual impact can be:

- Direct (primary) effects on the landscape fabric and character of the site, and on views and visual amenity;
- Indirect (secondary) effects on the surrounding landscape character and setting of landscape features;
- Temporary or permanent, reversible or irreversible; and
- Static or dynamic, continuous or fleeting.

5.1.7 Other factors to consider as part of the impact assessment process include:

- Magnitude and duration of impact
- Sensitivity of landscape and / or visual resource
- Significance of residual effect
- Valency of effect (adverse, beneficial or neutral)

Assessment Criteria and Significance of Effects

5.1.8 Landscape and visual effects are assessed by measuring the magnitude of impact against the sensitivity of the receptor. Simply put significance is a function of magnitude and sensitivity. Each of these three factors is determined by a combination of quantitative (objective) and qualitative (subjective) assessment using professional judgement.

Guidance on Wind Farm Visibility

5.1.9 It is recognised that, due to perspective and 'aerial perspective', potential visual effects tend to decrease with distance. The sensitivity of a receptor and the magnitude of change will also vary the level of effect. Guidelines exist regarding the distance at which turbines may become prominent in views from the surrounding area. The Scottish PAN 45 (revised 2002)¹ gives the following guidance on visibility of turbines with a tower height of over 70m and rotor diameters of over 80m.

Table 5.1 Perception of Wind Turbines

Distance	Prominence
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¹ Scottish Natural Heritage and University of Newcastle (2002) 'Visual Assessment of Windfarms: Best Practice' (Table 3, page 10)

<2 km	Likely to be a prominent feature
2-5 km	Relatively prominent
5-15 km	Only prominent in clear visibility – seen as part of the wider Landscape
15-30 km	Only seen in very clear visibility – a minor element in the landscape

Magnitude

5.1.10 The magnitude of effects on landscape, views and visual amenity is evaluated according to a seven-point scale: Very High, High, Medium, Low, Very Low, Negligible and None. The impact magnitude of a particular proposal will depend on a number of factors including:

- Nature of proposed development / perceived change compared with existing situation
- Scale of proposed change compared with existing context
- Duration of change
- Reversibility of change
- Number and type of observers affected

5.1.11 Broad criteria for assessing impact magnitude on landscape, views and visual amenity are given in the table below.

Table 5.2 Impact Magnitude

Landscape Impact Magnitude	
Negligible	Indiscernible or barely discernable change to physical elements and / or landscape character in view – project components tend to go unnoticed in the wider landscape
Very Low	Very low levels of change to physical elements and / or landscape character in view – project components are generally perceived as a background element in the wider landscape
Low	Low levels of change to physical elements and / or landscape character in view – project components are present in the landscape but generally perceived as a background component of the wider landscape
Medium	Medium levels of change to physical elements and landscape character in view – project components are relatively prominent in the landscape but generally appear as subservient to, or in equilibrium with, the underlying landscape characteristics
High	High levels of change to physical elements and / or landscape character in view – project components are prominent in the landscape and are generally perceived as a determining factor of local character
Very High	Very high levels of change to physical elements and / or landscape character in view – project components are very prominent in the landscape and are unavoidably perceived as a determining factor of local character

Visual Impact Magnitude	
Negligible	Observers generally experience no change to views and visual amenity

	– project components tend to be indiscernible or go unnoticed in the wider landscape and views
Very Low	Observers generally experience a very low level of change to views and visual amenity – project components tend to be perceived as a background element in the wider landscape and views – very easily go unnoticed
Low	Observers generally experience a low level of change to views and visual amenity – project components are present in the landscape but tend to be perceived as a background component of views – easily go unnoticed
Medium	Observers generally experience a medium level of change to views and visual amenity – project components are relatively prominent in the landscape, but tend to appear as subservient to, or in equilibrium with, the landscape characteristics in view – easily noticed
High	Observers generally experience a high level of change to views and visual amenity – project components are prominent in the landscape and tend to be perceived as a determining factor of the view – difficult not to notice
Very High	Observers generally experience a very high level of change to views and visual amenity – project components are very prominent in the landscape and are unavoidably perceived as a determining factor of the view – impossible not to notice

Note – This seven-point scale forms the basis of the nine-point scale used in the impact significance matrix presented in Table 5.5 below and Appendix 5.2

Sensitivity

5.1.12 The sensitivity of a specific landscape or visual receptor (ie. place, person or route excluding landscape character units) is dependent on a range of factors including:

- Permanent residence (dwelling or settlement)
- Type of resource (public / private, urban / rural, residential / recreational)
- Nature of use (public / private, indoor / outdoor, active / passive)
- Quality and / or value of resource and its attributes (conservation / popularity status)
- Public access / outdoor recreation status (PRoW, POS, access land etc.)
- Dynamic or static
- Vehicular or non-vehicular

5.1.13 Unless specified otherwise elsewhere in this report the sensitivity of landscape and visual receptors is classified on a three-point scale (low, medium, high) as set out in the table below

Table 5.3 Receptor Sensitivity

Landscape

Receptor	Rationale	Sensitivity
Absence of distinctive landscape characteristics and scenic qualities; presence of landscape detractors; undesignated countryside and landscape features	High tolerance to change	Low
Some distinctive landscape characteristics and scenic qualities; few landscape detractors; locally designated / valued countryside and landscape features	Medium tolerance to change	Medium
Strong / distinctive landscape characteristics and scenic qualities; absence of landscape detractors; nationally designated / valued countryside and landscape features	Low tolerance to change	High
Visual		
Receptor	Rationale	Sensitivity
Major roads / transport routes, Places of work (B2, B8 use class); Indoor sports and leisure facilities; Undesignated landscape features without public access.	Observers in vehicles or people involved in daily activities are generally less sensitive to visual change	Low
Minor roads designated as national trails / cycle routes and crossing common land, access land and National Trust land, plus main roads within nationally important landscapes (eg. AONBs or National Parks); Outdoor sports facilities; B1 work places / commercial properties.	Observers enjoying the countryside / landscape from vehicles on quiet routes or those involved in sporting activities / active outdoor recreation are in general moderately sensitive to visual change	Medium
Residential property; Rights of way / recreational trails; Countryside with public access such as common land, access land and National Trust land; Protected landscape features with public access.	Observers enjoying the countryside / landscape either from their homes or pursuing quiet outdoor recreation are usually more sensitive to visual change	High

5.1.14 The sensitivity of landscape resources, for example specific character areas, is dealt with in more detail in the Evaluation of Landscape and Visual Environment section below.

Significance

5.1.15 The purpose of an EIA is to determine, in a transparent way, a project's likely significant environmental effects. It is accepted that, due to the nature and scale of development, as reiterated in PPS22, the proposed wind park would potentially give rise to some significant visual and landscape effects. However, it should be stressed that, not all effects arising would be significant in EIA terms. Furthermore, a significant effect would not necessarily mean that the impact is unacceptable in EIA or planning terms. What is important is that the likely effects are transparently

assessed and understood in order that the determining authority can bring a balanced, well-informed judgement to bear when making the planning decision. This judgement should be based on weighing up the broad environmental benefits of renewable energy against the disbenefits arising from anticipated impacts of a particular scheme, as advised in PPS 22.

5.1.16 The significance of effects on landscape, views and visual amenity are evaluated according to a five-point scale: Major, Moderate, Minor, Negligible or None / Neutral. A description of the significance criteria is provided in the table below. It is important to note that effects can be beneficial as well as adverse. Notwithstanding the question of valency, subjectivity and positive attitudes towards wind energy as recorded in various public opinion surveys (see sub-section below), it is assumed in this LVIA that effects would be adverse unless stated otherwise.

Table 5.4 Significance of Effect

Significance of Effect	Landscape Resource	Visual Resource / Amenity
Major	Where the proposed changes would be sufficiently large or uncharacteristic to substantially alter a nationally important landscape feature / valued aspect of landscape	Where the proposed changes would be sufficiently uncharacteristic or intrusive to substantially alter a nationally important view, or view of high scenic quality
Moderate to Major	Where the proposed changes would be noticeably out of scale with the underlying character of an area or substantially alter a locally important landscape feature / valued aspect of landscape	Where the proposed changes to views would be noticeably out of scale with the existing view and/or substantially alter a locally important view, or view of scenic quality
Moderate	Where the proposed changes would be out of scale with the underlying character of an area or noticeably alter a landscape feature or aspect of landscape	Where the proposed changes to views would be out of scale with the existing view or noticeably alter a view
Minor to Moderate	Where proposed changes would be readily apparent and at slight variance with the underlying character of an area and / or landscape features	Where proposed changes to views would be noticeable and at slight variance with the existing view
Minor	Where proposed changes would be intermittent and at slight variance with the underlying character of an area and landscape features	Where proposed changes to views would be intermittent and slight variance with the existing view
Negligible to Minor	Where proposed changes would have a barely discernible effect on the character of an area and landscape features	Where proposed changes would have a barely noticeable effect on views / visual amenity
Negligible	Where proposed changes would have an indiscernible effect on	Where proposed changes would have an indiscernible effect on

	the character of an area and landscape features	views / visual amenity
None	No effect	No effect
Neutral	Where there is a balance of positive and negative landscape impacts or perceived benefits and disbenefits	Where there is a balance of positive and negative visual impacts or perceived benefits and disbenefits

5.1.17 For the purposes of this assessment those effects indicated as being of ‘Moderate / Major’, ‘Major / Moderate’ and ‘Major’ significance, as shaded in the Significance Matrix below, are regarded as significant in EIA terms. Effects of ‘Moderate’ and lesser significance have been identified in the assessment, but are not considered *significant* in terms of the EIA Regulations 1999².

Table 5.5 Significance Matrix

Magnitude	Sensitivity		
	High	Medium	Low
Very High	Major	Major/Moderate	Moderate/Major
High	Major/Moderate	Moderate/Major	Moderate
Medium to High	Moderate/Major	Moderate	Moderate/Minor
Medium	Moderate	Moderate/Minor	Minor/Moderate
Low to Medium	Moderate/Minor	Minor/Moderate	Minor
Low	Minor/Moderate	Minor	Negligible/Minor
Very Low	Minor	Negligible/Minor	Negligible
Negligible	Negligible/Minor	Negligible	Negligible/None
None	Negligible/None	Negligible/None	None

Note – The nine-point scale of magnitude used above is based on the seven-point scale presented in Table 5.5 above, the two extra criteria being the two intervals between high, medium and low

5.1.18 It should be noted that the above matrix is intended as a guide to assessment only and that significance can vary depending on individual circumstances and the baseline situation, for example the presence of landscape designations and / or visual detractors. This is particularly true with landscape character effects, for instance in assessing whether (or not) a proposed development would (1) give rise to a new landscape character type in its own right where the wind turbines would become the defining landscape characteristic and / or (2) give rise to a new landscape sub-type in which the proposed development would be a major contributory element in defining character. In the first case the resulting effect would normally be significant. In the second case the assessor must use professional judgement to determine the extent of the effect and whether it is significant or not.

Public Attitudes to Wind Energy Development and Valency

- 5.1.19 Environmental effects can be beneficial (positive) or neutral as well as adverse (negative). This is known as the ‘valency’ of effect which depends on a) the type and nature of impact and b) the perception / opinion of the observer, with the latter being particularly pertinent to the assessment of wind farms. The term ‘valency’ applied to EIA originates in Durham County Council guidance³ and is commonly referred to in LVIA’s and Inspectors’ decision reports.
- 5.1.20 Wind farm development generates a variety of responses ranging from strongly adverse to strongly positive. Experience of individual responses to proposed wind energy development is that opinions can differ not only between close (i.e. adjacent) neighbours, but also between members of the same family living in the same house. Surveys of public opinion relating to renewable energy development including wind farms, like the one referred to below, are helpful in understanding the valency issue.
- 5.1.21 The DTI document titled “Renewable Energy Awareness and Attitudes Research: Management Summary” was published in May 2006 and reports on quantitative research undertaken “to explore awareness and attitudes to renewable energy amongst the general public in Great Britain”. Section 4.2 provides the results of respondents attitudes towards renewable energy, which includes the following:
- 78% of respondents agreed with the statement “I support the Government’s policy of generating 10% of our electricity needs from renewable energy by 2010”, with 53% agreeing strongly. 84% of those who stated that living near a traditional power station, and 87% of those who stated that living near to a renewable energy development had influenced their views on renewable energy, agreed with this statement.
 - 81% of respondents agreed with the statement “I am in favour of the use of wind power”, with 54% agreeing strongly. 9 out of 10 respondents who stated that living near a renewable energy development had influenced their views on renewable energy, agreed with this statement.
 - 61% of respondents agree with the statement “I would be happy to live within 5km (3 miles) of a wind power development”, with 32% agreeing strongly. Those who cited living near a traditional power station as an influence on their views on renewable energy were more likely to agree to this compared to those who did not cite this (71% versus 61%).
- 5.1.22 The report concluded that “Overall, people are in favour of renewable energy, including the use of wind power, and they support Government policy on this subject... [however] although over half the respondents strongly agree....only a third (32% strongly agree) would actually be happy to live within 5km of a wind power development”.
- 5.1.23 It is evident from research into public opinion that current attitudes towards wind turbines differ – some people find them attractive, fitting and necessary, to others they appear ugly, incongruous and unwelcome. Looking ahead, as awareness increases of both environmental issues and the pressing need to address climate change and energy security, more and more people visiting the countryside are likely to take the former, positive standpoint. Therefore many visitors now and in the future are likely to find views of them interesting and even exhilarating, thus adding to the variety of recreational experience provided by the landscape at large. Paradoxically therefore,

² HMSO, The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999

³ Durham County Council, ‘Impact Assessment Matrices’ Unpublished, (1996)

judging from experience at other operational windfarms in the UK⁴, the countryside may well see an increase in visitor numbers due to wind energy development, an outcome which would accord with development plan policy and Government objectives relating to health, recreation and access to the countryside, for example as promoted by Natural England⁵.

Valency and the Nature of Landscape and Visual Effects

- 5.1.24 The European Landscape Convention defines 'landscape' as: "*an area, as perceived by people, whose character is the result of the action and interaction of natural and / or human factors.*" In this LVIA 'landscape' is understood to be at one and the same time a physical entity and a mental construct. People's perception of landscape inevitably varies and one person's arcadia may well be another's wasteland. In the context of LVIA a particular landscape and visual change may be perceived as adverse, neutral or beneficial by different people depending on the perspective of the observer.
- 5.1.25 Judging by recent public opinion surveys and considering likely future trends referred to above in the previous subsection it would be fair to say that more people nationally look favourably (and will continue to do so) on wind energy development than do not. This means that, in general, a greater number of observers are likely to perceive landscape and visual changes arising from well designed and sited wind parks as beneficial or neutral compared with those who experience them as adverse. It is reasonable, therefore, to assess the significance of landscape and visual change without prejudice as to the valency of effect.
- 5.1.26 To address the question of 'valency' in the LVIA only the level of significance of landscape and visual change is recorded in the text, thus bringing to the attention of the decision maker those effects which are predicted to be significant in EIA terms. However, in the interests of clarity and for the purposes of EIA, it should be assumed that the default position is adverse and that residual landscape and visual effects identified in the LVIA would be adverse unless stated otherwise. This reflects the possibility that, although change to landscape character and visual amenity may be perceived by some people as positive, or neutral, a particular change such as the one proposed (wind turbines in the countryside) can also be inconsistent with planning policy, as set out in PPS7, which seeks to maintain the status quo in landscape

Subjectivity versus Objectivity

- 5.1.27 It is important to note that judgments in this LVIA, including those on the valency of effect, are impartial and based on professional experience and opinion informed by best practice guidance⁶. Whatever the judgment made (whether adverse or beneficial) by either of the polarised camps in the windfarm debate, there will be a contrary judgment which, provided it is founded on reliable information and genuinely held, will be legitimate and should therefore be afforded respect.

Zone of Theoretical Visibility (ZTV)

- 5.1.28 The Zone of Theoretical Visibility (ZTV) is the theoretical area from which part or all of the development site or proposal is potentially visible. The extent of the ZTV broadly defines the study area for the landscape and visual impact assessment (LVIA). It was produced in accordance with

current best practice guidance⁷ using WindFarm software and an Ordnance Survey (OS) 'digital terrain model' (DTM) with 50m grid resolution and an assumed observer eye height of 1.7m. Curvature of the earth was taken into account.

- 5.1.29 Preliminary 'bareground' ZTV plans were prepared for scoping and initial assessment purposes using terrain only. For the ES chapter two versions of the ZTV 'with / including screening' were produced: one showing visibility to 'hub-height'; the other to 'blade tip', both of which take into account woodland blocks and buildings as shown on OS 1:50,000 scale 'Landranger' maps. The woodland and buildings were modelled in WindFarm software using assumed heights of 15m for trees and 8m for residential properties.
- 5.1.30 It should be noted that the ZTV 'with / including screening' plans do not take account of certain visually significant features such as engineered structures and hedgerow / roadside vegetation. As these landscape features are likely to screen or partially obscure the development in many views, the 'with / including screening' ZTV plans represent the 'worse-case scenario' visibility. Consequently, in practice, there will be many locations within the ZTV where views of the proposals will not be possible. This is particularly true in relation to many properties, rights of way and roads which are enclosed by earth banks, walls, tall hedges, garden vegetation, mature trees and incidental woodland.

Views, Visual Receptors and Viewpoints

- 5.1.31 Areas where views of the proposals would be theoretically possible were determined by means of the ZTV analysis described above and verified in the field. Visual receptors located within the ZTV and likely to experience visual change were identified and their sensitivity established in accordance with best practice guidance as set out above. A representative set of viewpoints were selected for production of the photomontages included in this chapter.

View Ranges

- 5.1.32 Government guidance and experience from recent windfarm projects and planning appeals in the UK indicates that 100-120m tall turbines (approximately) are perceived as 'prominent' features in the landscape up to 2 km away, 'relatively prominent' from 2-5km and 'present' between 5-15km, with the degree of 'presence' diminishing with distance. Beyond 15km the visual influence of the turbines would become increasingly less as they read more and more as part of the landscape at large. For the purposes of this assessment, views have been classified according to four distance 'ranges' as follows:

Table 5.6 View Ranges

Range	Distance threshold	Reasoning
Close	Less than 2km	At close range the proposals (when visible) would tend to appear as 'prominent' features in the landscape and visual receptors are likely to experience between medium and very high magnitude of change when compared with existing views
Medium	Between 2km – 5km	In medium range views the proposals (when visible) would tend to appear as 'relatively

⁴ All-Party Parliamentary Group on Tourism May 2006: 'The Impact of Windfarms on the Tourist Industry in the UK' (see page 2)

⁵ <http://www.naturalengland.org.uk/ourwork/enjoying/outdoorsforall/default.aspx>

⁶ *Guidelines for Landscape and Visual Impact Assessment (2nd Ed 2002) The Landscape Institute and IEMA*

⁷ *Scottish Natural Heritage, 2007, 'Visual Representation of Windfarms: Good Practice Guidance'*

		prominent' features in the landscape and visual receptors are likely to experience medium to low magnitude of change compared to the existing situation
Medium to Long	Between 5km – 15km	In medium to long range views the proposals (when visible) would tend to appear as 'present' features in the landscape and visual receptors are likely to experience low to negligible magnitude of change compared to the existing situation
Long	More than 15 km	In long range views the proposals (when visible) would read as part of the wider landscape and visual receptors would tend to experience very low to negligible magnitude of change compared to the existing situation

5.1.33 These view range thresholds are marked on all figures together with intermediate 5km distance bands.

Assessment Area Thresholds

Study Area

5.1.34 The extent of the ZTV and study area – 35km – is based on current best practice guidance for 100+m tall turbines set out in '*Visual Assessment of Windfarms: Best Practice*' 2002 Scottish Natural Heritage (Table 17 on page 58). Although the proposals would theoretically be visible over greater distances in periods of very good visibility, it was considered unnecessary to extend the study further due to the contained nature of the ZTV and because at 30km the limit (acuity) of the human eye is being approached. It is assumed that no impacts would arise beyond the study area.

Detailed Assessment Area

5.1.35 Impacts on landscape character and views / visual amenity depend partly on the distance of the receptor / observer from the development proposed. The limit of *significant* landscape and visual effects of the proposals (in EIA terms) is assumed to be 10km from the site. This is due to a combination of the scale of development proposed and the characteristics of the receiving environment. Above 5km landscape character effects are assumed to be negligible and visual impact significance is unlikely to be greater than negligible beyond 10km. Consequently, in order to focus on likely significant effects, the 'detailed assessment area' threshold is set at 10km radius from the site centre.

Photomontage Methodology

5.1.36 This section deals with the methods used to photograph and prepare photomontages for Heckington Fen Wind Park.

Procedure for taking photographs from photomontage viewpoints

5.1.37 Photography and visualisation procedures in this LVIA accord with the current guidance in particular that set out in:

- Landscape Institute Advice Note 01/09: Use of Photography and Photomontage in Landscape and Visual Assessment
- Scottish Natural Heritage, 2007, 'Visual Representation of Windfarms: Good Practice Guidance'

5.1.38 Photograph locations (Photomontages and Character Views) were selected in order to:

- Meet with the local planning authorities requirements;
- Provide a fair representation of the development proposals; and
- Contain at least four visible reference points of existing features that can be used to verify the proposal location later in the photomontage process.

5.1.39 The majority of photographs were taken in favourable weather conditions and clear visibility. A few photos were taken in cloudy and hazy weather to illustrate typical variations in atmospheric conditions and visibility.

5.1.40 A 35mm format SLR type digital camera was used with a 50mm equivalent lens as recommended in current guidance including Landscape Institute (LI) GLVIA 2002 and LI Advice Note 01/09. The same exposure setting was used for all the frames for each panorama.

5.1.41 Where possible the wind park site was placed in the middle of the view with frames taken either side to give the landscape context. A compass was used to ensure the wind park was located at the centre of the panorama. The panoramas were photographed with the horizon in the centre (as near as possible) using a level tripod which was rotated on the same grid co-ordinate to ensure individual frames were aligned.

5.1.42 Known reference points, where possible visible to the naked eye, were used to assist in constructing the photomontage, for instance landform, landmarks, buildings and structures.

5.1.43 The actual panorama splay for photomontage purposes is 70 degrees. However, wide panoramas were photographed to provide broad coverage of the landscape to be assessed including cumulative assessment schemes. The panoramas were produced by splicing the photos together with specialist software. A 50% overlap was taken between frames to allow the sides of each photo to be removed when splicing to minimise distortion.

Method for production of photomontages

5.1.44 The photomontages were generated using Adobe PhotoShop imaging software. The digital photographs were inputted directly into the computer program and each frame was combined to form a panoramic view. As far as possible the horizon was kept level. Photographs were corrected for colour, brightness and/or contrast to ensure that the image quality was optimised.

5.1.45 A computer model of the wind park proposals was generated with 'WindFarm' software using data provided in the GB National Grid coordinate system. The arrangement and size of the turbines (blade diameter and hub height) were modelled in accordance with the application drawings. Curvature of the earth was calculated using standard settings within 'WindFarm'.

5.1.46 Photomontage viewpoints were determined using GB National Grid coordinates established when taking the photographs. The direction and viewing angle of the perspective was matched with each panoramic view using reference features or 'locators' setup within 'WindFarm'. The wireline

computer images were placed onto the photographs and scaled/positioned so that the locators in the image matched those in the photographs.

- 5.1.47 The computer model was rendered as a 'solid model' perspective and saved as an image file thus creating the photomontage. Each image was presented on an A3 wide format sheet (330 x 120mm) showing the existing view and the proposed view, plus viewpoint location, distances to the turbines, and specific camera information. To correctly simulate views in the field the A3 image should be viewed at a distance of 33cm from the eye which is roughly equivalent to 1ft.

Terminology and Definitions

- 5.1.48 *Impact* is specific and applies to a particular element of the environment, for example a tree, character area or view. In order to assess the potential impact of a particular development on an element of the environment, it is necessary to measure the degree of change caused to that element by the proposal. A description of that change can be made factually. The degree of change is expressed in terms of high, medium, low, negligible, or none based on professional judgement.
- 5.1.49 An *effect* is the result of an impact considered in the context of the sensitivity of the element(s) in question. It tends to be a broader based view concerning the culmination of one or more impacts involving professional judgement and some extrapolation and generalisation. Effects are expressed in terms of major, moderate, minor, negligible, neutral or none.
- 5.1.50 A *significant* landscape or visual effect is one which is deemed 'significant' in terms of the EIA Regulations 1999 as set out above. It is important to note that a significant landscape or visual effect does not necessarily equate with harm or unacceptability in planning terms.
- 5.1.51 'Visual amenity' is understood to be the visual benefit or pleasantness provided by the environment as enjoyed in views. The emphasis of the assessment is on public amenity but the private amenity of residential properties and places of work is also considered. The visual environment of a particular property or area is made up of both specific views and general visual amenity. These two elements are assessed together from specific viewpoints.
- 5.1.52 'Residential amenity' is understood to involve a combination of sensory factors which inform the living conditions of a property including the visual, sound / noise and olfactory (smell) environments.

Assumptions and Limitations

- 5.1.53 In line with current best practice guidance⁸ the focus of this LVIA is the potential affect on publicly available views of the landscape and the visual amenity it provides as opposed to the private sphere. The planning system functions to regulate the use and development of land in the public interest. It is not there to regulate or protect private interests such as views from, or visual amenity of, individual properties. Public and private interests may coincide when the quantity of private properties affected become a collective issue, such as views of a valued landscape enjoyed by substantial numbers of people.
- 5.1.54 The recorded magnitude of impact and significance of effect are those which are predicted to occur during the winter months when deciduous vegetation is devoid of screening foliage.

- 5.1.55 Notwithstanding the question of valency, subjectivity and public attitudes towards wind energy development, for the benefit of doubt, it is assumed in this LVIA that effects would be perceived as adverse unless stated otherwise. This precautionary approach reflects the current planning policy position which seeks to maintain the status quo in landscape terms as set out in PPS7.
- 5.1.56 It should be noted that it was beyond the scope of this LVIA to gain access to individual dwellings or gardens and the nearest public access point was used for visual assessment purposes.
- 5.1.57 The Zone of Theoretical Visibility (ZTV) of the proposed wind park is based on terrain / landform, built form and large blocks of woodland. It does not take into account the screening effect of incidental vegetation such as hedges, hedgerow trees, garden and roadside planting, shelterbelts, tree-lined watercourses and engineered structures such as road and railway embankments, and therefore represents the worst-case scenario visibility. For the purposes of this assessment the extent of the ZTV is assumed to be broadly the same for the construction phase as with the operational phase.
- 5.1.58 Windfarms are normally sited in elevated and exposed locations to best exploit the wind resource. This combined with their height invariably means that the turbines break the skyline in views from the surrounding area. Notwithstanding the lowland location surrounded by high ground the proposed wind park would be viewed breaking the skyline from some vantage points. This factor has been taken into account when assessing impact magnitude and significance of effects.
- 5.1.59 The same applies to the dynamic nature of windfarm development with its rotor movement and variable horizontal alignment or 'yaw' which changes according to wind speed and direction. For the purposes of assessing potential effects it is generally assumed that the yaw angle would be such that the rotor is always facing the observer / viewpoint, as depicted in the photomontages included in this chapter. However, in practice yaw angle is dictated by wind direction and the prevailing wind at any particular location will also be a consideration when assessing potential effects.
- 5.1.60 The proposed access tracks would be generally 4m wide and up to 5.5m width on bends. Consequently an average of 5.5m width land-take across the whole length is assumed to accommodate the access tracks and cabling trenches alongside.

Acknowledgements

- 5.1.61 The approach to assessing potential effects on landscape character used in this LVIA, as described at **Annex 5.1** below, has been adapted from one developed by Jeffrey Stevenson Associates (JSA). JSA have considerable experience in the LVIA of wind energy development, both at the planning application and public inquiry stages, and are acknowledged experts in this discipline. The JSA methodology is based on current best practice guidance on LVIA for the UK.

⁸ *Guidelines for Landscape and Visual Impact Assessment (2nd Ed 2002) The Landscape Institute and IEMA (para 7.30, p.90)*

ANNEX 5.1: METHOD FOR ASSESSING LANDSCAPE CHARACTER EFFECTS

INTRODUCTION

5.1.62 This annex is provided in support of the Methodology section above. The text and diagram with 5 examples is intended to explain the way in which changes to landscape character are assessed and how significant effects are identified. The concept of landscape character is summarised in the following table.

Landscape Character

Landscape Character	The distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and how this is perceived by people. It reflects particular combinations of geology, landform, soils, vegetation, and use and human settlement. It creates the particular sense of place of different areas of the landscape. ⁹
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. ¹⁰
Landscape Character Areas	These are single unique areas and are the discrete geographical areas of a particular landscape type. ¹¹
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. For example, chalk river valleys or rocky moorlands are recognisable and distinct landscape character types. ¹²

Example 1

5.1.63 It is necessary to assume a landscape setting for a proposal – in this case downland. A wind farm is placed within it. The wind farm exerts a locally characterising effect. A wind farm landscape would be created in the area where the wind farm is the strongest and dominant characteristic. In this area, the wind farm would be the principal element / feature which determines landscape character with the surrounding landscape elements being sub-dominant by comparison. Moving outwards and away from the site, the wind farm would exert a lessening effect upon landscape character with the surrounding downland increasing in characterising influence, becoming co-dominant in the adjacent mixed landscape sub-type, and then reasserting its overall dominance farther afield.

⁹ The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2002; p120

¹⁰ Swanwick, C., and LUC; *Landscape Character assessment – Guidance for England and Scotland*; Countryside Agency/Scottish National Heritage; 2002; p8

¹¹ Swanwick, C., and LUC; *Landscape Character assessment – Guidance for England and Scotland*; Countryside Agency/Scottish National Heritage; 2002; p9

¹² Swanwick, C., and LUC; *Landscape Character assessment – Guidance for England and Scotland*; Countryside Agency/Scottish National Heritage; 2002; p9

Example 2

5.1.64 Example 2 considers a downland landscape type with two sub-types – wooded downland and arable downland. In this case the wind farm's characterising effects are limited to the 'wind farm in downland' landscape and (diminishing with distance) the 'wooded downland with wind farm' sub-types. The characterising effect does not extend into the adjacent arable downland sub-type. Thus, within the downland two new landscapes would be created: a 'wind farm in downland' landscape type and a 'wooded downland with wind farm' landscape sub-type, which would coexist with the original arable downland and wooded downland landscape sub-types.

Example 3

5.1.65 Example 3 indicates the change when a wind farm is placed on or close to the boundary of two landscape units.

Example 4

5.1.66 Example 4 starts with an assemblage of 6 landscape units. A wind farm is located on, or close to the boundary of two of the units. The characterising effects are as in Example 3. Because of the position of the wind farm, the effect extends some way into landscape units 3 and 4, but not as far as units 1, 2, 5 & 6. In other words, the distinct and recognisable pattern of landscape elements that occurs consistently in units 1, 2, 5 & 6, and how they (units 1, 2, 5 & 6) are perceived by people is being unaffected.

Example 5

- 5.1.67 Example 5 explores possible landscape and visual effects that may or may not arise across units:
- 5.1.68 Location A – the observer is positioned within a part of the landscape that is subject to significant landscape effects deriving from the wind farm. At the same time, the wind farm gives rise to a significant visual effect.
- 5.1.69 Location B – a significant visual effect may still occur when looking in the direction of that part of the landscape which accommodates the wind farm but the observer is beyond the zone of characterising effects where significant landscape change may occur.
- 5.1.70 Location C – the observer may be sufficiently distant from the wind farm such that she/he is not only outside the zone of characterising effects / significant landscape change but also beyond the range of significant visual effects.
- 5.1.71 Observers positioned at B & C are aware of looking at a 'wind farm landscape' sub-type and a 'landscape with wind farm' sub-type but are not located in either.
- 5.1.72 It may be asked: 'why is it possible to experience a significant visual effect looking at a wind farm but not be located in an area subject to a significant landscape effect? When an assessor is carrying out landscape character identification and assessment, she/he executes the work from a series of locations within the environment. In identifying the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, she/he does this by having regard to the environment 'in the round', that is to say in a 360° context, and not solely viewing in a single direction. Thus it is possible to be in a position whereby, in the 360° scheme of things, a wind farm may be a visible, but not be a determinative, or even substantive element within the pattern of elements that gives rise to the character of the area in which the viewpoint is located.

Notwithstanding, the observer might, by limiting her/his gaze to the direction of the wind farm, consider it to be a visually significant change in that limited sector of the view – see Observer B above. In other words, it is not significant with respect to the landscape character at the

observation point albeit it may be visually significant looking in one particular direction. See diagram below illustrating the examples described above.

