

ASSESSMENT OF THE EXTENT TO WHICH EXISTING ONSHORE WIND DEVELOPMENTS IN NORTHUMBERLAND HAVE BEEN SUCCESSFULLY ACCOMMODATED INTO THE LANDSCAPE

MAIN REPORT & FINDINGS

to

NORTHUMBERLAND

Northumberland County Council

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Cover photograph: Boundary Lane Wind Farm, near Consett, (Viewpoint 1 from Boundary Lane)
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Wingates Wind Farm on the Wingates Ridge Landscape Character Area at Coldrife (Viewpoint 13)

1. INTRODUCTION

- 1.1 The Planning and Environment Studio Ltd (PES) and Bayou Bluenvironment Limited (BBE) have been commissioned by Northumberland County Council to deliver a report to assess *'The Extent To Which Existing Onshore Wind Developments In Northumberland Have Been Successfully Accommodated Into The Landscape'*.
- 1.2 The scope of the commission was:
- a. *'To review the landscape, visual and historic impact assessments (and any other relevant impact assessments) submitted with all individual applications for the agreed scale of wind turbines / wind farms, which have so far been implemented; and advise on the degree to which the actual impacts are as predicted, including cumulative effects;*
 - b. *Using information from the review provide advice on possible approaches to assessing future proposals, including cumulative effects, that could be identified either in emerging Core Strategy policy, supplementary planning guidance, and as part of the validation requirements for wind energy applications;*
 - c. *Identify any additional work required to underpin the evidence base for the Core Strategy e.g. update to the relevant sections of the Key Land Use Impact Study.'*
- 1.3 This report represents the culmination of an extended study period within which emerging findings have been presented to the project team in order to help inform emerging Local Plan spatial policy for wind energy development, and to provide early indications of opportunities for improved development management practice in relation to on-shore wind energy proposals. The findings may also help inform the Council as to the requirements it places on applicants with respect to its planning application validation list.
- 1.4 This report is one element of two main outputs from the study:
- Main Report and Findings (this report); and
 - Separate Technical Appendix
- 1.5 This report brings together and expands upon outputs presented to the project team as emerging findings over the course of the research period. Across the research period methodology was refined and tested in comparing predicted effects to observed landscape, visual and heritage effects from three installed wind farms. In doing so, the timing and significance of emerging findings were such that they were available as a consideration in the revision and refinement of Core Strategy Full Draft Plan policy for wind energy (and renewable energy more generally) within the public consultation stage of the plan between 12th December 2014 and 11th February 2015.

- 1.6 This report reflects desk and field-based study carried out between April 2014 and February 2015. Across that period regular liaison and discussion between the Council and consultants have taken place with study focus and approach refined iteratively by consensus.
- 1.7 It is critical that the purpose and brief for the study is understood in considering the findings of this report. In doing so it is particularly important to note that the study **is not a review of the merits of any of the planning decisions taken, nor an examination of processes and negotiations undertaken during the processing of the planning applications** by the Local Planning Authorities, the Planning Inspectorate or by the Secretary of State in relation to wind energy proposals. It does not offer a view as to whether any harm to landscape and heritage assets identified was justified in the balance of other planning policy and material considerations and aspirations. This study focuses squarely on how predicted effects of wind energy proposals compare to observed impacts (whether positive, neutral or adverse) following the installation and operation of those proposals over a number of years, and how lessons can be positively taken from this. From this examination the report seeks to identify strengths and weaknesses of past experience such that spatial policy and day-to-day development management practice can be improved in light of aspirations for renewable energy generation objectives within the capacity of the distinctive environmental and heritage context of Northumberland.
- 1.8 It is significant to note that technical findings of this report, particularly into the accuracy of submitted supporting materials to planning applications for those wind farms studied are necessarily distilled from approved applications only. No analysis or conclusions are drawn as to the accuracy and scope of supporting material submitted with refused applications.
- 1.9 This study adopts the categories of wind farm size listed below, as described in the Scottish Natural Heritage (SNH) publication '*Siting and Designing Wind Farms in the Landscape*', Version 2, May 2014. The grouping is a simplification; it is important to recognise that landscape and visual impacts are not directly proportional to wind turbine numbers and turbine height is also an important consideration in landscape, visual and historic impact.
- | Wind farm size | Number of turbines |
|----------------|--------------------|
| Small | 1-3 |
| Medium | 3-20 |
| Large | 20-50 |
| Very Large | 50+ |
- 1.10 In adopting these categories the study has reviewed the impacts of small and medium wind farms, and a large wind farm where two wind farms are in such close

proximity that they effectively read as one (Middlemoor Wind Farm and Wandylaw Wind Farm).

- 1.11 The authors of this report wish to acknowledge the valuable input and support which has been provided by the project team of officers of Northumberland County Council and Northumberland National Park Authority over the extended period over which this study has been undertaken. In particular gratitude is expressed for helpful but non-directing feedback to detailed preceding iterations of this report, and for adopting an understanding approach to extended survey periods triggered by poor weather conditions.
- 1.12 Following this introductory chapter, chapter 2 provides an executive summary of the findings of the study. Chapter 3 clarifies the scope of the study whilst chapter 4 sets out the study methodology. Chapter 5 presents generic findings relating to the comparison of predicted landscape, visual and heritage wind energy effects compared to those found by this study. Chapter 6 sets out a more detailed examination of predicted and experienced effects found by the consultants on a wind farm-by wind farm basis. Chapter 7 provides advice in relation to the evolution of local spatial policy for wind energy based upon the findings of the previous chapters, whilst chapter 8 affords similar recommendations in relation to development management practice. An extensive Technical Appendix setting out evidence gathered within this report accompanies this Final Study Report
- 1.13 **Tables A1 to A9 at Appendix A1** set out the choice of viewpoints for examination during the study. **Appendix A2** provides an extract from earlier study outputs with recommendations for refinement of Policy 37 on renewable energy to inform the council's Core Strategy Full Draft Plan.
- 1.14 A glossary of terms is provided at the end of this report that defines the meanings of terms used in the context of the study. Terminology can be complex and potentially confusing within landscape and visual assessment, even for professionals in this area. For example the terms 'impact' and 'effect' were found to be inconsistently used within the Environmental Statements (ES) and Landscape and Visual Impact Assessments (LVIA) reviewed during the study, often being interchanged within the same ES or LVIA. 'Impact' is correctly defined as the action being taken, and the 'effect' is the change resulting from the action. However, this report refers to these terms as they were used within the documents reviewed.
- 1.15 An extensive Technical Appendix setting out evidence gathered during the study accompanies this Main Report and Findings as a separate document.

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2. EXECUTIVE SUMMARY FINDINGS

- 2.1 The following points set out the key findings of this study. These should be viewed as headline points only, and full context for these findings is presented in the following chapters and appendices.

Overview of Landscape, Visual and Heritage Effects

- Significant adverse landscape and visual effects from wind energy developments have arisen in parts of Northumberland. However, these are in the main localised in extent although some longer distance impacts were observed.
- Significant cumulative landscape and visual effects across those parts of the county studied are also localised in extent (for example Wandylaw with Middlemoor and Boundary Lane with Kiln Pit Hill Wind Farms).
- Most installed wind energy developments across the county (at the time of study) have altered the balance of features within the landscape locally, but generally have not altered that character either significantly or irreversibly.
- The potential for harmful adverse cumulative landscape and visual and character effects is however increasing, and in more sensitive locations, significant. Landscape capacity may be close to its thresholds in parts of the county.
- Adverse effects upon important views and vistas from some of Northumberland's most distinctive and important landscape and heritage features have been identified. In particular, inland vistas from the Northumberland Coast Area of Outstanding Natural Beauty (AONB), and particularly from some of its outstanding heritage assets (in particular the coastal Castles) have been eroded as has its wider landscape context and sense of remoteness.
- The passage of time was found to have significant effects in relation to the visual prominence of wind turbines, both negative and positive due to forest clearance and more generally woodland and vegetation growth.
- Effects on the setting of specific heritage assets have generally been limited and have not significantly degraded the value of this distinctive resource across Northumberland overall. However, views from and the immediate context of some specific sites have been harmed.

Technical Findings

- Submitted landscape, visual and heritage assessment material in support of planning applications for wind energy developments varies in quality and accuracy, but was *mostly* found to present *conclusions* with which this study concurred although specific points of disagreement have arisen (for example, in the scale of zones within which likely potential adverse effects might arise).

- Photomontages, (notwithstanding issues of accuracy) were helpful in assessing landscape effects to a greater degree than wireframe visualisations.
- Within the general support for the conclusions of ES material on landscape and visual effects, issues of inaccuracy in visualisations were consistently observed as listed below.
- Photomontages and wireframes are usually presented at A3 size within a separate volume of the ES or as part of the main ES, and either way are often large unwieldy documents that proved very difficult to use in the field.
- Photomontage and wireframe visualisations of proposed wind energy developments invariably present images which when observed in the field under-represented the scale of visual prominence of installed turbines by around 30%.
- Some wind farm layouts as installed diverge from visualisations by a magnitude greater than could be attributed to micro-siting variations.
- Selection of visualisation viewpoints were found on occasion to be unhelpful by using sites where vistas of the proposed development was limited or screened, yet open vistas could be found in close proximity.
- Supporting material to help accurately locate visualisation viewpoints (grid references, descriptions and OS mapping extracts) was frequently inaccurate or not-fit-for purpose.
- Determination of the ‘significance’ of predicted impacts was inconsistently arrived at across the study sample.
- Where systematic matrices were presented for determining the ‘significance’ of effects as a function of magnitude of effect and sensitivity of the receptor, professional judgements would tend to underplay effects where marginal assessments arose, although examples of a precautionary judgement were also observed.
- Significance matrices tended to weight possible outcomes towards non-significant effects.
- Significance matrices differed in respect to the transparency of categorisation of effects or magnitude of change.
- There tended to be an inverse correlation between the age of the ES or other supporting material and their quality and transparency, although the technical shortcomings noted above were evident over more recent outputs as well as older materials.

3. SCOPE OF THE STUDY

Selection of Wind Farms Sample for Study

3.1 Following discussions with the project team, the scope of the study into the extent to which existing wind developments in Northumberland have been successfully accommodated into the landscape was agreed, and focused upon a sample set of wind farms displaying a range of locational, age and scale characteristics. At the time the study was commissioned, there were 15 permitted and installed wind farms (excluding micro-generation turbines) across the county. Following the initial findings of the study which focused upon essentially large scale, rural, upland and inland wind farms, it was considered appropriate to expand the evidence base to include wind farms which displayed differing characteristics, particularly in terms of age and location. Hence it was appropriate to examine wind farms which displayed (as far as these characteristics existed):

- A range of scales (turbine size and generation capacity);
- A range of ages (since installation);
- Lowland rural locations;
- Urban locations; and
- Coastal locations.

3.2 **Table 1** sets out 9 (of 15) wind farms across Northumberland that were selected for the examination and comparison of pertinent application material with observed impacts through field survey. These are listed in chronological order of study, and for no other significant reason.

Table 1: Study Wind Farms

Wind Farm	General Location	No. of Turbines
Wingates	Longhorsley	6
Wandylaw	Alnwick	10
Middlemoor	Alnwick	18
Kiln Pit Hill	Shotley Bridge	6
Boundary Lane	Shotley Bridge	3
Green Rigg	Bellingham	18
Kirkheaton	North of Hexham	3
Cramlington MSD	Cramlington New Town	2
Lynemouth	Ashington	13

3.3 Although not an explicit requirement of the study nor significant in terms of findings, the sample also included wind turbine developments from all but one (Berwick-upon-Tweed Borough Council) of the former constituent district and borough

councils which operated as Local Planning Authorities prior to local government re-organisation in Northumberland on the 1st April 2009.

- 3.4 Outline profiles of each of these wind farm sites are set out within Chapter 6. **Figure 1** identifies the spatial distribution of the sample wind farms across the county.

The Scope of Study Examination

- 3.5 In line with the project brief as refined and agreed with the project team, the study addresses the following elements and characteristics of the sample wind farms, taken from desk-based examination of Environmental Statements and other supporting information and through field survey comparison:

- Effects on landscape character;
- Visual effects;
- The significance of landscape and visual effects;
- Consideration of cumulative landscape and visual effects (where practicable);
- Viewpoint visualisations – photomontages and wireframes;
- Impacts upon heritage assets.

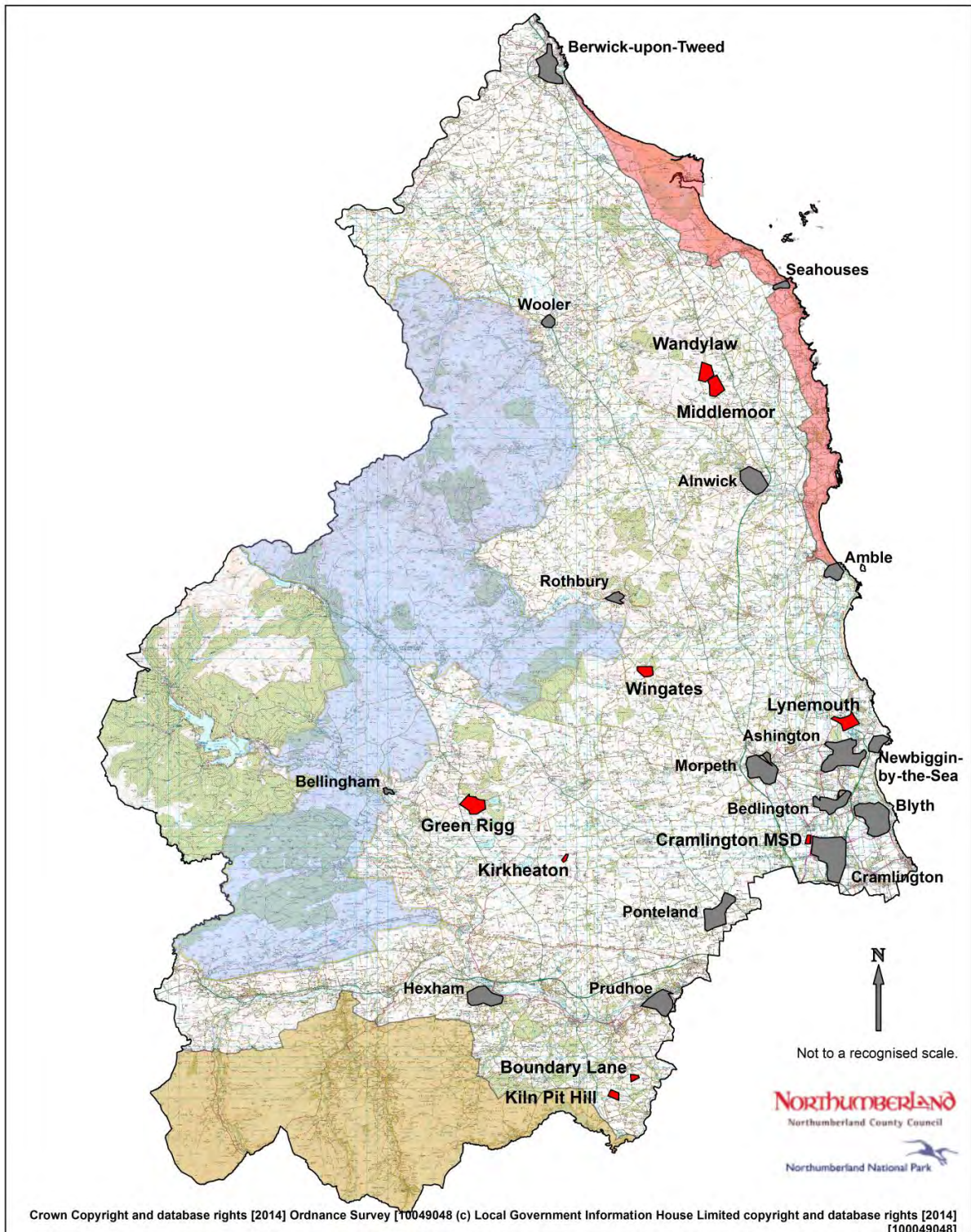


FIGURE 1.

Study Sample Wind Farms

- Wind Farm Areas (indicative)
- Northumberland National Park
- Northumberland County Boundary
- Northumberland Coast Area of Outstanding Natural Beauty
- Urban Areas (indicative)
- North Pennines Area of Outstanding Natural Beauty



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4. Method & Study Stages

4.1 In undertaking the study the consultants have followed a multi-staged approach comprising detailed desk-based review and field survey work before analysis and reporting. The following elements are explained within this chapter:

- Document review;
- Selection of viewpoint assessments;
- Collation of additional materials;
- Field Survey;
- Analysis.

Document Review and Field Survey Preparation

4.2 The scope and volume of supporting material submitted alongside each planning application was found – not surprisingly, to be extensive in most cases.

Comprehensive Environmental Statements (ES), including their critical Landscape and Visual Impact Assessments (LVIA) (as far as they existed), frequently ran to several hundred pages, across multiple volumes. Given the scope of this study it was necessary therefore to review the most pertinent elements of those applications, ESs and supporting documents so as gain an understanding of each site’s characteristics and to develop an understanding of how the proposed installations evolved, what the key environmental considerations and constraints have been, and through which consenting mechanism the proposals were finally permitted (i.e. appeal or by the LPA). Inspector’s Reports and Secretary of State’s Decision Letters have also been reviewed.

4.3 Central to this study is the appreciation and understanding of how the predicted landscape and visual effects of the proposals were presented and how accurate or representative these can be judged to be following their installation. Reflecting this and the complex nature and extensive volume of supporting material, it was expedient to summarise and tabulate where possible, certain elements of each ES. This approach was primarily based upon summary assessment of *Viewpoint* assessments contained within each of the LVIA chapters within the ESs and relevant technical appendices examined.

4.4 This approach allowed for simplified accessibility to extracts of key statements upon anticipated landscape and visual effects of the proposals, whilst allowing also for a consistent approach (and hence comparison) to be made between each of the individual viewpoints as well as across the various study sites for which LVIA material may have been differently compiled. A different approach has been adopted for heritage considerations focusing on summary narratives within ES chapters and technical appendices, as impacts in this respect are not necessarily well-aligned with ES viewpoint selection.

- 4.5 A template 'Viewpoint Assessment Table' was prepared as set out at **Figure 2** which was developed, trialled and refined through the carrying out of initial work.

Selection of Viewpoints for Assessment

- 4.6 As a consequence of the considerable volume of material associated with the study sites, it was considered impracticable and inefficient to assess each and every viewpoint presented in each ES (numbering approximately 125 in total across all 9 study sample wind farms). However, it was considered important that a *majority* of viewpoints were examined for the study and that it was important to select those where particular issues might reasonably be expected arise, such as impact upon designated landscapes, recognised heritage assets or other sensitive receptors.
- 4.7 In line with the examined ES /LVIA methodologies which *generally* recognised a limited element of visual impact on distances over 10-12km, a focus was made on viewpoints inside that radius, although some longer distance viewpoints have been assessed, such as from the Cheviot for Wingates and Middlemoor Wind Farms. It is important to recognise however that such a sieve of some longer distance views does not imply that the study concludes that such vistas cannot be of importance in terms of visual effects, particularly in relation to views from sensitive/iconic viewpoints or across recognised important vistas (such as between nationally important heritage features or upland areas and iconic summits). A secondary sieve of viewpoints was undertaken in relation to the type of visualisations presented by the ES/LVIA for any particular point. Although not an absolute filter, where viewpoint material did not include photomontage visualisations and only wireframes set out for longer distance sites, a number of these were excluded from review as practical comparison in the field was anticipated to be less likely (and later verified) to provide useful comparison material. Finally, discussion with the project team in respect of the consultants' initial draft viewpoint selection lead to further minor refinements to the list of viewpoints to be assessed. **Tables A1 to A9 at Appendix A1** set out the choice of viewpoints for examination by the study following this selection process. A total of 86 LVIA viewpoints have been examined and compared in the field.

Figure 2: Viewpoint Assessment Table Template:

Wind Farm Name:								
Date & Time of visit:		Weather:		No of Turbines:	Height to Hub:	Height to Tip:	Distance to nearest turbine:	
ES Grid Ref:	No. of visible turbines		Accuracy of turbine layout and visualisation(s)	Assessment of visual effects		Assessment of landscape effects		
	In ES	Site visit		In ES	Site visit observations	In ES	Site visit observations	
Recorded Grid Ref:				Sensitivity:		Sensitivity:		
				Magnitude of effect:		Magnitude:		
				SIGNIFICANCE		SIGNIFICANCE		
General Notes and Observations								
A B C.... X Y Z								

Collation of Additional Fieldwork Material

- 4.8 To further enable a consistent approach across the field survey stage of work (*see following section*), Landscape Character Assessment extracts were used as an *aide-memoire* in assessing character effects from the selected viewpoints. These allowed for the completion of the *greyed-out* 'ES' elements of the Viewpoint Assessment Tables before visiting the site (Figure 2). In addition to these, *original* copies of the Environmental Statements were used on site to compare observed and predicted effects. Use of the original hard copies was considered to be essential in order to secure an accurate representation of the developers' predicted effects against those actually observed. Using original copies allowed for greater confidence in respect to assessing colour, clarity and scale of the images to be used at specific recommended viewing distances (where specified) (i.e. paper image to the eye distance – typically 300mm, but also lesser and greater distances in some cases).

Field Survey

- 4.9 Field survey work constituted a significant element of the study overall. Survey primarily entailed assessment of the accuracy of material taken from the separate ESs for each study wind farm selected viewpoint. All survey work was carried out by two senior consultants together in order to ensure consistency, agreed (moderated) judgments and to stimulate discussion on issues observed, as well as for health and safety purposes on in some cases upland and remote sites. Field survey was undertaken over several multi-day periods between May and November 2014.
- 4.10 The study primarily focused on assessment of ES/LVIA Viewpoint analysis and visualisations as selected. Fieldwork also included a random visual assessment of the observed accuracy of Zones of Visual Influence / Zones of Theoretical Visibility (ZVI/ZTV). For this element a less structured assessment was appropriate because of the very extensive nature of ZVI coverage and the highly complex patterns of potential visibility of turbines they set out, which for a great majority of coverage does not relate to accessible land and/or is at considerable distance from the site and viewpoints. As the areas identified by the ZVI was entered upon public highways, a visual check and note of observed visibility was made, although the frequent influence of vegetation and frequent poor visibility afforded the accuracy of such checks with limited certainty in many instances, and generally served to support the principle that ZVIs will always present a 'worst case scenario' in relation to visual effects.
- 4.11 GPS devices were used in the field independently by both senior consultants to identify the exact point from where the photograph / photomontage / wireframe viewpoint of the ES was located. At each selected viewpoint a Viewpoint Assessment Table (**Figure 2**) was completed by the consultants together.

Photographic records were taken from the viewpoints where it was possible to locate visualisation points as accurately as possible. This was achieved by using key landscape features or other visual references along with the Grid References set out within the ESs and on specific visualisations, although these did not always prove to be coincidental (see Chapters 5 and 6 *Findings* sections). In such circumstances visual references were used to best estimate where the ES baseline photograph had been taken. In most instances this was a reasonably simple process. Photographs were taken to reflect ES stated photographic settings, and where possible to reflect established best practice standards at the time the LVIA was carried out¹. This entailed utilising a full-frame DSLR camera with a fixed 50mm focal length lens set to infinity focus, tripod mounted and levelled at a height of 1.5m (**Figure 3**). Whilst best practice for LVIA visualisation baseline photographs suggests that only uncompressed 'RAW' image files should be used in preparing visualisations. RAW format images were captured within the early study exercise and for some elements of the project roll-out, but experience indicated no discernable benefit in relation to the specific purposes of this study and proposed use of those photographs (primarily aide-memoire for the report's compilation). Therefore because of the extremely large digital file size for .RAW images 'JPEG' image files were used for practical purposes.



Figure 3: Reflecting best practice, using full frame DSLR camera with fixed 50mm lens with levelling tripod at North Charlton, Wandylaw Wind Farm.

- 4.12 The ability to replicate photographs set out within ES material was however often hampered by prevailing weather conditions at the time and/or the direction of the

¹ Scottish Natural Heritage, Visual Representation of Wind Farms – Version 2 July 2014

sun in relation to the camera at the time of visiting each viewpoint. In some cases for some viewpoints effective field survey recording was impossible due to light and weather conditions and return visits were necessary.

- 4.13 The field survey exercise sought to record the following *observed* information for comparison against predicted impacts set out with the ES supporting each planning application:
- Grid References for viewpoints;
 - Number of turbines visible and to what extent (approximately);
 - Accuracy of turbine layout/distribution in relation to one another;
 - Accuracy of turbine siting/location in relation to landscape features;
 - Visual effects – assessment of sensitivity of viewpoint receptor, magnitude of visual effect;
 - Landscape Character effects – assessment of sensitivity of character area (at viewpoint), magnitude of landscape effect;
 - Overall significance of landscape and visual effects;
 - Visual and perceptual impacts upon heritage assets (as relevant);
 - General assessment of the effective value of ES visualisations;
 - Photographic record to best practice guidance (emerging) where weather/light permitted.

Difficulties Encountered in Field Survey Stage

- 4.14 Notwithstanding issues arising which are described in the following section of this report, some significant difficulties were encountered in undertaking fieldwork. Primarily this related to the weather and visibility conditions across the survey periods. Over 4 weeks of field work very few 3 *excellent* days of visibility were experienced. Across the remaining periods visibility ranged from reasonable in relation to nearer distance viewpoints but not appropriate to more distant views, to almost minimal visibility at even near distances. For example, assessment of localised viewpoints at Wingates during an early field survey period occasionally resulted in the nearest turbine being partly visible but the others completely obscured even at close distances (for example less than 500m). In the context of assessing wider landscape and visual effects conditions experienced often challenging. This resulted in a greater number of visits to sample sites than anticipated at the outset of the study in order to secure authoritative survey results.
- 4.15 **Figure 4** illustrates poor visibility at Wingates Wind Farm from VP1 (Embleton Terrace) – typical of that experienced through some fieldwork periods. Blue arrows indicate observed location of turbines.
- 4.16 Other localised but significant difficulties were experienced in relation to Viewpoints which were taken to replicate the visual experience of travellers such as along main

roads. In particular hazardous survey locations were experienced in relation to viewpoints for Wingates (A1 narrow verge), Green Rigg (A68 narrow verge) and Lynemouth (A189). On accessing such sites it was hazardous to survey from the site with cumbersome camera equipment. Consideration of the appropriateness of these locations and others as viewpoints is given in the following chapter 5 *Findings* section.

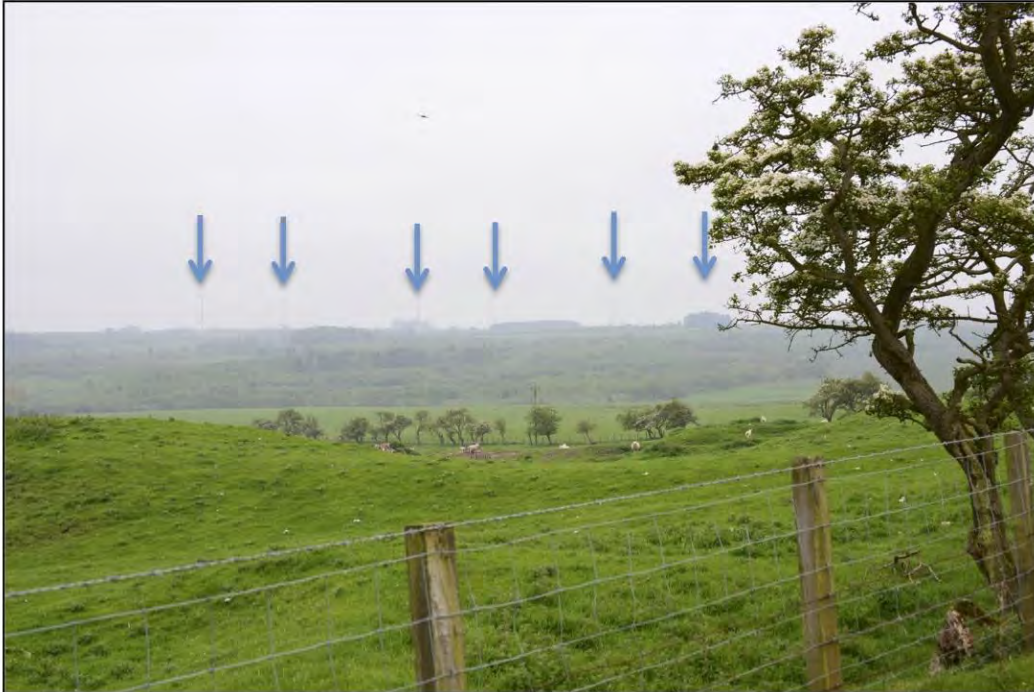


Figure 4: Poor visibility at Wingates Wind Farm

- 4.17 Other issues arising related to photography and replication of ES visualisation base images. Where possible fieldwork was planned to view sites with natural backlight, i.e. views from the east in the morning and views from the west in the afternoon. However this could not always be managed as a consequence of the range and distribution of sites and the visibility encountered at any one time. Study resources did not allow for the amount of time it would take to record each site in optimal conditions and best time of day. **Figure 5** illustrates the difficulty of capturing views of the wind farms when backlit.
- 4.18 In practical terms using original copies of visualisations prepared at A3 size, bound within extensive documents, often proved to be difficult to manage in remote and exposed locations or in windy conditions. However, it was considered important to utilise original hard copies of ES material so that there could be confidence in relation to the scale and clarity of visualisations, which might otherwise be altered within a copying process.



Figure 5: Backlit viewpoint at North Charlton, Wandylaw VP2. (Arrows indicate position of partially visible turbines).

5 GENERIC STUDY FINDINGS:

Analysis of Environmental Statement Visualisations

- 5.1 The expansion of the sample base of the initial stage study to the full sample of nine wind farms allowed for evidence-based and specific findings to be reached as to the landscape, visual and heritage effects of existing on-shore wind developments across Northumberland and has enabled a view to be developed as to how these may or may not have been successfully accommodated into the landscape. However, the inherently subjective nature of Landscape and Visual Impact Assessment (whilst entailing professional judgement) that encompasses complex issues of sensitivity, magnitude of effect and significance, technical intricacies of visualisation techniques involving factors such as distance, human perception, ZTV/ZVI, wireframes, photomontages and photographic specifications – amongst other things, makes for complex subject matter affected by multiple variable influences.

Generic Study Findings

- 5.2 The bulk of the evidence gathering for the study has been the completion of Viewpoint Assessment Tables for each of the viewpoints assessed. 86 Completed tables are set out with the **Technical Appendices**, based upon a refinement of the template shown in **Figure 2**. From these, a range of generic findings have emerged together with more specific findings in relation to the individual wind farms and their environmental impacts. These generic findings which have been found to apply to most of the sites and ES material examined are discussed in the following paragraphs, considering each of the sub-headings in the Viewpoint Assessment Tables in turn. More specific analysis of the impacts from each wind farm studied is set out at Chapter 6.

LVIA Viewpoint Selection

- 5.3 It is evident that some viewpoints had been selected within LVIA's which did not appear serve to positively assist decision makers or stakeholders reaching informed positions on the potential impacts of the wind farms on sensitive receptors. Possibly this was as a result of over-reliance on the ZVI/ ZTV and desk study in selecting viewpoints at scoping stages as opposed to being provisionally assessed by field survey and/or from non-specific input from stakeholders. From some viewpoints landform and/or vegetation screened or significantly limited the view of the wind farm. In other instances a slight re-positioning of the surveyor one-way or the other gave a much clearer view than those selected as being representative. In the case of Wingates VP6 (the A1 south bound verge at Morpeth), it was patently hazardous to park and access the viewpoint with camera equipment. Written description within the LVIA of the viewpoint was inaccurate, and suggested 'safe'

layby parking was possible. This was not the case in practice and consequently raises issues of confidence in the choice and consideration of the viewpoints selected. In that instance the viewpoint was assessed by this study but accessed via a walk along a significant stretch of the narrow verge from off-site parking.

5.4 All viewpoints are described within LVIA's as 'representative viewpoints', agreed with the respective Councils at ES scoping stage to give a broad range of views from potential receptor groups such as residential property, users of rights of way and outdoor recreation, travellers etc. The choice of some 'representative' viewpoints is questioned by this study. A number of viewpoints have been utilised which do not appear to offer the most helpful findings on significance of effects on sensitive receptors. For example, the choice of Wandylaw VP10 'Gains Law' on St Cuthbert's Way, appears to have been selected as a consequence of highest elevation on the long distance path, but in practice offers far less helpful views of the turbines than parts of the path to the east of Gains Law, equally (if not more so) likely to be used by those reaching the aforementioned summit. It is also clear that some important viewpoints at key sensitive receptors have not been considered or chosen within the LVIA's. One particular example is the grade 2* Peel Tower at Preston, which lies just east of the A1 and only 3km from the nearest turbines, but is not included in the Middlemoor or Wandylaw assessments. However, Middlemoor VP17 was selected approximately 1km from the tower, but which offered considerably less significant visual impacts from a considerably less sensitive receptor. Similarly, the iconic coastal heritage feature of Dunstanburgh Castle, lying in the Northumberland Coast AONB is not recognised as a sensitive key receptor, with the LVIA study area of Middlemoor Wind Farm extending to 10km, only marginally short of this significant asset. Other significant illustrations of ill-considered viewpoint selection included VP13 for Cramlington MSD where the site fell within the Area of High Landscape Value local designation, but was entirely located within private land away from any public right of way or access.

5.5 Notwithstanding a significant frequency for which viewpoints were selected with a degree of questionable benefit, the majority of viewpoints examined within the study were valid and helped illustrate likely views or vistas from a range of receptors. This in part may have arisen through the LPA requesting amended viewpoint visualisations where dissatisfaction with original submissions arose. The influence of stakeholder input or scoping responses from statutory consultees in the EIA process may be particularly important in ensuring such information is helpfully collated.

Identifying Viewpoints in the Field

5.6 Despite the use of Grid References and mapped locations within LVIA's, accurately locating a number of viewpoints from stated grid references given in the ES figures

proved difficult in some cases. GPS devices were used in the field independently by both senior consultants to identify the exact point from where the photograph / photomontage / wireframe viewpoint of the ES was located. Usually the approximate viewpoint location was clear from landscape features in the photograph, such as vegetation, fencing, telegraph poles etc., but this did not always closely reflect the GPS co-ordinates stated. In most cases there was only a slight deviation but in some cases there were significant differences in the grid reference of the ES to that recorded at the viewpoint (much greater differences than those that may be expected through margins of error). In many instances the mapped accuracy of the viewpoint as indicated on the LVIA Ordnance Survey 'thumbnail' location map proved relatively unhelpful. In most cases these were based upon OS 1:50,000 scale maps where detailed landmarks and surface features, such as field boundaries are not included, and/or visual referencing in the field did not align well to those map extracts, further reducing survey confidence. In some cases the Ordnance Survey thumbnail location maps were out of date, such as at Middlemoor VP15 which now falls within Brizlee Woods RAF base. Incidences of map obsolescence are however relatively likely with the passage of time.

Number and extent of turbines visible

- 5.7 The number of turbines recorded across the study sample LVIAs and those less detailed 'environmental reports' as being visible from the viewpoint was generally accurate in the *number* of observed turbines. There was some discrepancy in the *extent* of turbine visible, for example whether it was the entire turbine, its tower, hub and/or blades, where this was given in the ES text or in supporting figures, but where discrepancy was noted it could usually be attributed to the growth in vegetation between the viewpoint and wind farm since the photograph was originally taken. In this respect ES LVIAs were undertaken as long as 17 years ago (in the case of Kirkheaton) before this study was conducted and hence vegetation growth was sometimes found to be considerable. Conversely, and pertinent to the upland plantation landscapes of mid Northumberland and the coastal strip, the felling and clearing of commercial woodlands also served to reveal turbines to a degree greater than the visualisation may suggest, and/or serve to further confuse precise landscape references in location viewpoints. The observed visual impact of these compared to the visualisations is addressed below.

Accuracy of turbine layout and siting

- 5.8 The layout of turbines of each wind farm was found to be relatively accurate in terms of their *relation to each other* in most cases, but in others *significant* variations were noted. The study found some discrepancy, in some instances quite marked, in the wind farm layout in relation to landscape features i.e. from some viewpoints the positioning of turbines was not as shown in the photomontage or wireframe in that the entire wind farm array was located (visually) to the 'left' or

'right' of the surveyor than was presented in the visualisation. This was particularly noticeable at Wingates (see Technical Appendix 1, Field Sheets VP1 and VP5), but also for Wandylaw, Middlemoor, and Green Rigg with very significant (in excess of 150m) variation noted from the viewpoint at Cateran Hill (VP2 - Middlemoor). Such variation could not reasonably be attributed to 'micro-siting' variance from approved layouts. However, from other viewpoints for the same installations, relative siting and positioning was found to be more reflective to that observed, suggesting inconsistency in the accuracy within the same series of visualisations.

- 5.9 **Figure 6** sets out by way of example how the 'observed' wind turbines as installed, vary considerably in position from the photomontage (extract) prepared for Wingates Viewpoint 2, from the south-western edge of Longframlington.

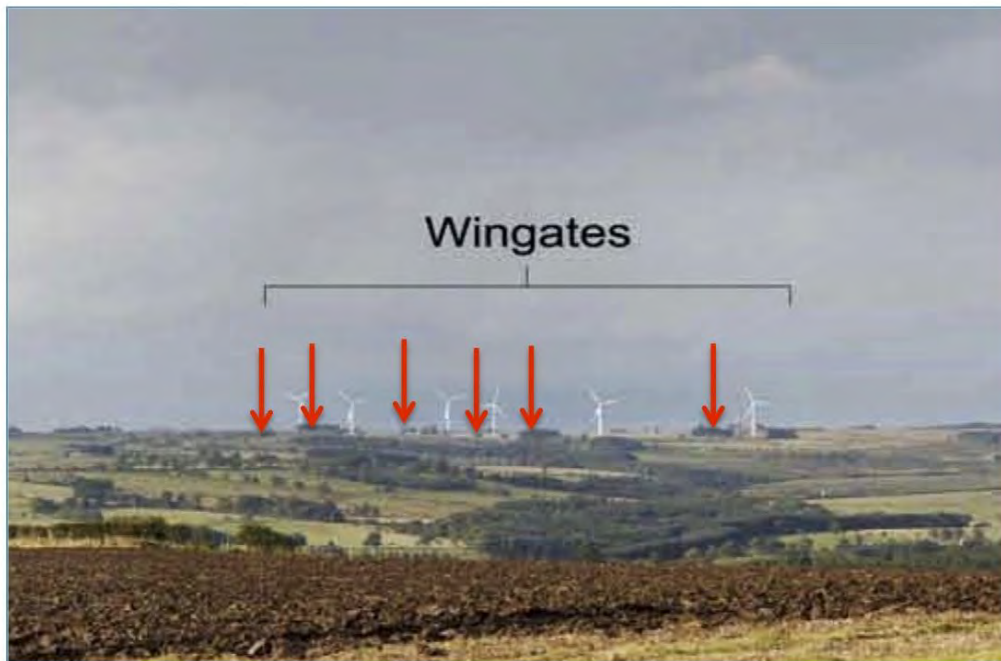


Figure 6: Observed turbine positions superimposed on ES photomontage *extract*.
For clarity red arrows indicate those observed.

Wireframes and Photomontage:- Perception of Scale

- 5.10 The most striking and consistent observation taken from across the study sample sites was that photomontages and wireframes were found in the majority of cases to underestimate the actual observed scale of appearance of existing landscape features *and* the turbines in the landscape. When viewed at the correct viewing distance (as/where recorded on the photomontages/visualisations), and allowing for vegetation growth since the original photograph was taken, a clear impression was formed that all features within in the view, including wind turbines were shown to be considerably smaller than they are actually perceived by the naked eye. This effect was generally obvious even at more distant viewpoints. Comparing a

wireframe visualisation (where no photomontage was prepared) with the actual view to perceive an impression of effect was much more difficult given the absence of non-topographical landscape features that act as scale and position indicators, such as woodland, trees, buildings etc. Conclusions on relative effects are likely to be misleading if they have been made on the visualisations presented in the ESs, and hence may lead to planning decisions with actual impacts greater than anticipated.

- 5.11 During the study period Scottish Natural Heritage² published new guidelines for best practice in visualisations for wind energy proposals. This sets out revised guidance for the representations of visualisations at a scale that most closely meets the perception of the human eye as receptor at the viewpoint. The method requires photographs to be taken with a fixed 50mm focal length lens on a full frame DSLR, which is then cropped and blown-up to a 75mm focal length equivalent. This supersedes long-established guidance which requires only photographs to be taken at 50mm focal length scale. In undertaking this study comparisons of the two techniques were undertaken whereby the revised standard '75mm equivalent' A3 prints were compared in the field to the observed effect of the installed turbines at 8 sites across the study wind farms. This confirmed that illustrations prepared using the previous guidance would be likely to consistently under-represent perceived scale in relation to the human eye, and that following the latest guidance should produce visualisations that more accurately simulate the likely view experienced or observed from a view point.
- 5.12 It is difficult to robustly quantify the perceived difference in scale between that observed in the field, and the anticipated scale of development as set out within photomontages and wireframes of the LVIAs. However, taking the up-to-date guidance (75mm focal length equivalent) as being a good representation of observed scale and comparing identical field photographs at both scales, it can be seen that the 50mm focal length visualisations presents an image of *approximately* 70% of that perceived in the field (equivalent to the observed scale being around 140% larger than the 50mm focal length image). This study considers such variation to be significant.
- 5.13 By way of example, **Figure 7** sets out a comparison of the 50mm focal length and 75mm focal length equivalent representations of part of the view experienced from Wingates VP7 at Folly House. This shows both images side-by-side with the horizon closely aligned to facilitate better visual comparison and depth of image cropped to present the same field of view.

² Scottish Natural Heritage, Visual Representation of Wind Farms Good Practice Guidance, Version 2 July 2014



50mm focal length image from full-frame DSLR image of installed turbines.



75mm focal length equivalent image full-frame DSLR image of installed turbines.

Figure 7: Visualisation scale comparison

- 5.14 This study finding suggests it is reasonable to assume that the stakeholder engagement and decision-making processes for the sample wind farms were likely to have occurred whilst under-estimating the scale of the proposals later to be experienced in the field after construction. Clearly, the under-estimation of scale includes the topographical/landscape features context of the turbines as well as those structures, but this does not, and should not mitigate against the significant increase in visual impact the installed turbines have on receptors to that predicted within the visualisations. This study suggests that this should not reflect badly on the decision makers of the time, nor on developers or their landscape and

visualisation advisors, as the LVIA material was prepared in line with best practice established at the time of the proposals. Indeed SNH notes in its latest guidance that it was a disillusion of those practices and dissatisfaction with their accuracy that has resulted in the up-to-date guidance being developed.

- 5.15 This study finds that from a number of viewpoints the magnitude of visual effects appear to have been effectively underestimated as a result of the perception of the likely prominence of turbines arising from wireframes and photomontages. In underestimating the size of turbines in the visualisations they may appear to be more appropriately 'in scale' and less prominent (and themselves becoming another horizontal feature in the landscape when viewed en-mass such as at Wandylaw and Middlemoor) than they are actually perceived by the eye, leading to the likely underestimation of effects.
- 5.16 Considerations pertaining to the attribution of magnitude and receptor and landscape sensitivity within ESs is set out in more detail within Chapter 6.

Other Observations in respect of Turbine Prominence

- 5.17 In the course of the field survey work, it became apparent that a number of significant variables influence the perception of the relative prominence in the landscape of wind farms and individual turbines in addition to the points set out above. Individually and/or in combination, these can have significant implications for the consideration of the magnitude and significance of visual impact perceived, and add to the difficulty of seeking to accurately represent expected effects within snap-shot, two dimensional visualisations.
- 5.18 The magnitude of visual effect experienced (of installed turbines) can be increased:
- By a dark background, especially where sunlight illuminates the turbines (sun-lit turbines appear closer) so turbines can appear more prominent from higher viewpoints looking down, or from a low elevation where hills provide a darker background rather than from low elevation where turbines skyline and can be harder to distinguish against a light coloured sky;
 - Where they provide high contrast in a simple landscape (especially where other man-made structures, particularly with a 'vertical emphasis' are absent or limited);
 - Where they become the focal point in a static view, so longer distance views of turbines (where man-made features are not apparent) can be more significant in a highly sensitive landscape than closer middle-distance views (where man-made features provide visual cues that increase the apparent magnitude);

- By movement of the blades (especially where there is no other movement in the landscape) which is more obvious against a dark background than a light sky. Movement of blades at Wandylaw and Middlemoor, even in poor visibility, was perceived at distances of around 20km from Holy Island; and
- Where they draw the eye away from the otherwise main focus in the view such as iconic features and designed landscapes.

6. WIND FARM-SPECIFIC FINDINGS & ANALYSIS

Summary Comparison of Predicted Landscape, Visual and Heritage Effects and their Significance with Observed Effects of Northumberland Wind Farms.

- 6.1 This chapter sets out in more detail a summary review of each of the sample wind farms (and their pertinent supporting material) in relation to how their landscape, visual and heritage impacts were initially predicted and presented within the planning process. It then considers the effects observed and perceived by the consultants as installed wind farms. The chapter takes each sample wind farm independently and systematically examines those Environmental Statements, Landscape and Visual Impact Assessment and Heritage Assessments (as presented).
- 6.2 The function of this stage of analysis is twofold: Firstly, a review and critique of the scope, methods and embedded assumptions in relation to each ES's consideration of significance of impacts is made such that understanding of good and weaker practice can be made. Secondly, through review of findings and assumptions set out in the ESs a comparison of actual effects and perceived effects can be reached by which an overview of the impact of wind energy has had on Northumberland's special landscape and heritage capital can be reached.
- 6.3 This study considers visual and setting implications of the wind farm on the cultural heritage baseline within the context of relevant legislation and planning policy guidelines, setting out a range of potential effects of the proposals. Effectively the scope of this study in relation to the historic environment is focused upon *indirect effects*, as direct effects are (essentially) not ambiguous or subject to professional value judgements in relation to significance and the purposes of this study. Issues of direct effects as a consequence of disturbance or loss of archaeological assets are therefore not addressed.

6.1 Wingates Wind Farm. Landscape, Visual and Heritage Effects of the Environmental Statement

Wind Farm Profile - Wingates	
Location	West of Wingates (hamlet), Northumberland. Approx. 13km north-west of Morpeth
Number of turbines	6
Output (MW)	12-15
Height to hub	69m
Height to blade tip	110m
LPA / Appeal / SoS decision	LPA
Date of Permission	27.04. 11
Full ES? / Date	Yes /December 2008



Figure 8- Wingates Wind Farm (part of)

- 6.1.1 Wingates Wind Farm falls within a deeply rural location and stands at around 210m AOD. It is accessed from a network of minor roads lying between the A697 and A696. It stands some 500m from the nearest dwellings at Wingates hamlet. It is located within the Lowland Farmed Ridges LCT and Wingates Ridge LCA³

³ Northumberland Landscape Character Assessment, 2010.

- 6.1.2 The planning application for the wind farm was submitted to Alnwick District Council in December 2008. A full Environmental Statement was prepared.

Landscape and Visual Effects

Methodology

- 6.1.3 The ES sets out a full Landscape and Visual Impact Assessment. It notes methodology was developed reflecting up-to-date guidance including GLVIA Second Edition (2002)⁴ and SNH best practice in relation to predicting and assessing the impacts of renewable energy schemes.
- 6.1.4 A record of a comprehensive scoping process is set out and notes the engagement and influence of statutory consultees. Other assessment guidance documents used include the regional landscape character area descriptions from the Countryside Commission/ Agency⁵ and descriptions of local landscape types taken from a 2002 Government Office for the North East project⁶ and the Alnwick and Castle Morpeth LCA, 2006⁷.
- 6.1.5 The LVIA defines a 35km study area. Zone of Theoretical Visibility (ZTV) mapping was prepared to the full study area radius for prediction of the various extents of turbine theoretical visibility. Sixteen further viewpoints were selected for presentation of detailed visualisations illustrating anticipated landscape and visual effects. The viewpoints were agreed on site with officers of Alnwick District Council. In addition, the range of proposed or potential other wind farms were agreed upon in order to assist in cumulative assessment. This took a precautionary approach by selecting proposals at very early stages of overall project planning. A number of viewpoints were selected where cumulative impacts would potentially arise. Wireframe visualisations were prepared for these.
- 6.1.6 **Appendix A1** sets out the selected viewpoints examined by this study from the 16 presented within the ES, and outline reasons for selection.

Analysis of Viewpoint Assessments

- 6.1.7 The detailed findings of the viewpoint examination are set out at in the Technical Appendix to this report. In summary, the research found that the generic issues identified in relation to visualisations across the whole study sample were

⁴ Guidelines for Landscape and Visual impact assessment, LI/IEEMA, 2002

⁵ Regional Character Areas are taken from the Countryside Commission/Agency's *Countryside Character Volume 1: North East*, 1998

⁶ Benson, J.F., et al (2002) *Landscape Appraisal for Onshore Wind Development*, Government Office for the North East

⁷ AXIS (2006) *Alnwick and Castle Morpeth Landscape Character Assessment*, Final Draft

applicable to the Wingates case (Chapter 4). Further or specific issues identified in relation to the visualisations for Wingates included:

- Significant inconsistency in the accuracy of turbine layout / positioning was noted. A number of visualisations accurately represented views experienced from viewpoints, whereas a considerable proportion of the study sample showed discrepancies between installed and predicted siting. Within the scope of these discrepancies there was little consistency in layout inaccuracy;
- Viewpoint selection was considered generally appropriate with no significant omissions noted;
- Selection of the visualisation point on the A1 trunk road presented significant health and safety issues whilst poorly representing views in a northbound direction;
- Use of wireframe visualisations only from particularly sensitive receptors (e.g. Codger Fort and viewpoints within Northumberland National Park) were found not to facilitate clear indication of prominence and effect from these important locations;
- Some inaccurate application of Landscape Character Types and associated sensitivity to wind energy development (KLUIS 2010)⁸ was noted which influenced assessment of the significance of effects.

Analysis of Predicted Landscape and Visual Effects

6.1.8 A detailed review of the assessment of visual and landscape effects from the ES was carried out for the Wingates sample viewpoints (see Technical Appendix). This found that in the large majority of cases assessment of sensitivity of receptors and magnitude of change or effect of the development from the viewpoint were broadly supported.

6.1.9 A four-point scale is defined within the ES to assess landscape character and landscape element sensitivity to change; High, Medium, Low and Negligible. A combination of criteria is taken into account including landscape designation, scale and pattern, quality/condition, the nature of views (i.e. distance) and scope for mitigation. The Wingates LVIA transparently defines each significance category, in accordance with GLVIA. For example, the definition of a *Moderate* significant effect (i.e. not considered 'significant' in the LVIA) is:

'The proposed development would cause a noticeable difference to the landscape or view, and would affect several receptors'.

⁸ Not available at the time of application but published during the LPA's consideration of the proposals

- 6.1.10 Appropriate flexibility was noted in relation to application of sensitivity to landscape character types where these were affected by important landscape designations, particularly where LCTs’ sensitivity to change from wind energy development (KLUIS 2010) was increased where these fell within the Northumberland National Park.
- 6.1.11 In a limited number of instances the research found the LVIA to take an appropriately precautionary approach (over anticipating effects) to sensitivity and/or magnitude of change, and hence arguably affording a higher significance of the likely visual and landscape impacts.
- 6.1.12 The findings of any ES in terms of the headline significance of effects is dependent upon method applied to generate such values. For Wingates this is illustrated in **Table 2** below.

Table 2: Wingates ES Matrix for Determining Significance of Effect

Magnitude of Change	EFFECT SIGNIFICANCE			
	Substantial	MODERATE/MINOR	MODERATE	MAJOR/MODERATE
Moderate	MINOR	MODERATE/MINOR	MODERATE	MAJOR/MODERATE
Slight	MINOR/NONE	MINOR	MODERATE/MINOR	MODERATE
Negligible	NONE	MINOR/NONE	MINOR	MODERATE/MINOR
	Negligible	Low	Medium	High
	Receptor Sensitivity			

- 6.1.13 It was found that ‘significant’ effects in terms of the EIA Regulations 1999 are limited to those classified as Major and Major/Moderate outcomes only (highlighted in red in table 2). These classifications account for only three values on the significance matrix out of a total of sixteen. It can be seen that the weight of significance classifications are placed at the lower end of the receptor sensitivity scale (i.e. towards the ‘Negligible’ column) rather than the higher end and thus most combinations of sensitivity and magnitude of effects would have no bearing on whether summary impacts would be considered as significant within the ES.
- 6.1.14 In summary, despite there being some concerns regarding ‘significant’ effects being limited to those classified as Major and Major/Moderate only in terms of the EIA Regulations, this study found that the predicted landscape and visual effects from those viewpoints visited were on the whole accurate.

Cumulative and Visual Landscape Effects

- 6.1.15 The assessment of cumulative effects follows a detailed methodology utilising overlapping ZVIs from other wind farms at various stages of advancement through the planning process from screening to installed. A significant number of wind

farms in early planning stages are used in the cumulative assessment, and therefore in practice would only become an issue *after* Wingates was constructed and *if* they gained planning permission and were implemented. Cumulative effects were therefore assessed as both worse case scenarios in relation all to other *proposed* wind farms (from screening) as well as in relation to existing and consented wind farms. All other existing wind farms are in excess of 20km from the proposal site.

- 6.1.16 Impacts are assessed by identifying existing and approved wind farms within 60km of the site. Summaries of cumulative impacts are set out in relation to a range of receptors including settlements, landscape character areas, designated landscapes and all selected viewpoints. The same methodology for prediction of significance is employed for cumulative effects as for specific effects of Wingates only. Overall the methodological approach and thoroughness of the cumulative impacts is considered to be strong.
- 6.1.17 The ES sets out a broad range of predicted cumulative effects. It emphasises that potential effects indicated by the overlapping ZVIs are significantly reduced in reality due to land cover screening. Significant cumulative effects with existing wind farms were not identified and this study supports that position. More significant potential cumulative impacts were identified in relation to proposed/early planning proposals on a number of receptors, such as Northumberland National Park, some landscape character areas (i.e. Low Rolling Farmlands) and settlements such as Embleton Terrace, Rothbury and Longframlington. These will however be considerations in relation to the planning process for those proposals as they come forward.

Heritage Impacts

Methodology

- 6.1.18 Chapter 9 of the Environmental Statement addresses Archaeology and Cultural Heritage. For the purposes of the ES it scopes cultural heritage resources as being: Scheduled Ancient Monuments; Other archaeological features; Listed Buildings; and Conservation Areas. Historic Parks and Gardens are addressed within the LVIA of the ES.
- 6.1.19 The cultural heritage assessment of the ES uses methodology based upon best practice at the time of the assessment⁹. It sets out summaries of the key legislation and government policy for the various components and different

⁹ Institute of Field Archaeologists Code of Conduct (IFA 2006) and Standard and Guidance for Archaeological Desk-based Assessment (IFA 2001).

designations of historic environment. It sets out a schedule of receptors and their sensitivities to change at table 9.1, categorised according to the level of designation each type of asset is assigned, as shown in **Table 3** below. Beyond the immediate development site where detailed archaeological assessment is presented, a *study area* radius of 10km has been taken within which identified heritage assets are considered in relation to the adopted methodology, by definition to assess potential for indirect effects.

Table 3: Wingates Heritage Assessment Receptors

Importance	Site types
National	Scheduled Ancient Monuments Grade I & II* Listed Buildings (and nationally important Grade II Listed Buildings) Historic Parks and Gardens
Regional	Archaeological sites and areas of distinctive regional importance Grade II Listed Buildings (of distinctive regional importance) Conservation Areas
Local	Archaeological sites and areas of local importance Grade II Listed Buildings (important in a local context) Unlisted buildings and townscapes of some historic or architectural interest
Lesser	Other archaeological sites Find-spots

6.1.20 Magnitude and significance of potential effects of indirect impacts on heritage assets are assessed in the context of their period of effect, reversibility and nature (positive, neutral or negative). The ES presents the following hierarchy of categorised impacts: High, Medium, Low, Imperceptible and None. The ES sets out definitions of these factors and as such aids transparency.

6.1.21 In common with other elements of the ES methodology, a matrix-based process of attributing the scale of effects, and whether these are *significant* or *not significant* in the context of the EIA Regulations and is set out at **Table 4**. In doing so the assessment takes the position that only ‘Moderate’ and ‘Major’ significance effects are considered to trigger *significance* in relation to the Directive and Regulations (highlighted in red).

Table 4: Wingates Heritage Assessment Significance Matrix

Importance/Designation				
Magnitude of Effect	National / International	Regional	Local	Lesser
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate / Minor	Minor	Negligible	Negligible
Imperceptible	Minor	Negligible	Negligible	Negligible

- 6.1.22 No overt justification for the delineation of the study area boundary is presented within the ES. The 10km boundary is therefore inconsistent with other study area radii used within the ES, for example, 12km for Landscape Character Assessments, and 35km for ZTV, and 35km for an overview of landscape planning designations which include significant heritage assets such as Registered Parks and Gardens and Hadrian’s Wall WHS. In taking a 10km study area, assessment of indirect effects on heritage assets beyond this distance has not been undertaken. Whilst this study does not suggest that the assessment of heritage impacts from Wingates Wind Farm has been materially weakened, given the scale, topographic elevation and movement of the turbines alongside the exceptionally rich heritage resource of the county, the study may have benefitted from a methodology which allowed for impacts to be assessed beyond this study area on a selected site-by-site basis. This would allow for particularly important, high value heritage assets to be considered in relation to indirect impacts at greater distances.
- 6.1.23 Within the study area, assessment of indirect effects has been based partly upon the ZTV to blade tip, which sets a precautionary approach and is supported. The indirect effects of ‘setting’ are classified as being long-term but not permanent. This potentially underplays the significance of impact based upon a theoretical limitation to the installation’s operational life. In practice, it is feasible that the lifespan of the turbines will be longer than predicted or extended, and/or proposals to renew the installations would be a reasonably predictable scenario.
- 6.1.24 The heritage assessment of the ES concludes that, after localised turbine siting evolution and mitigation is considered, very limited harm would arise as a consequence of the proposals. In the main this study supports that finding.

- 6.1.25 Some anomalies in the assessment have been identified however. A ‘moderate, and not significant’ indirect effect is anticipated for a Grade II listed building - *The Chirm* in close proximity to the site. However, this level of impact is not reflected within Table 9.4 of the ES which sets out all heritage assets within the study area where significance is predicted as being above *negligible*. Contrary to the ES text this sets out the significance of impact upon the Chirm as being *minor*, and in doing so introduces a degree of inconsistency within the findings and presentation of the heritage assessment.
- 6.1.26 Of more considerable note is that there appears to be no assessment made within Table A9.2 of the technical appendices to the heritage and setting effect of the proposals on Codger Fort, a prominent and significant Grade II listed building (ruin) to the west of the site at a distance of 6km¹⁰. This is particularly significant as this is a selected Viewpoint for the LVIA element of the ES following consultation with the National Trust, and from which a Major/Moderate degree of *visual* significance was recorded. This apparent significant omission is worthy of note. If the heritage assessment relies upon the LVIA findings, it is not overtly set out.
- 6.1.27 The Heritage Assessment notes that there is a different approach to the attribution of *significance* to the heritage asset itself, to that of its setting such that assets of *national* importance are more capable of absorbing low magnitude effects on their *setting* than they are low magnitude, permanent and irreversible effects on their *character*. Whilst in most instances this position is agreed with, it potentially affords an opportunity for the impact of wind energy developments to be under-weighted where that setting is critical to the full understanding and experience of that asset. Given broad definitions and scope of ‘setting’ afforded by NPPF and English Heritage, it is feasible that low magnitude effects on a setting *could* be more important (and potentially ‘significant’) than this methodology allows for. For example, where a low magnitude of effect on setting is identified – i.e. detectable effects which do not alter the baseline condition of the receptor materially, but the sensitivity of the setting of the heritage asset is high, such as a specific vista from a Peel Tower, or other significant defensive structure (which partially characterises the county’s highly distinctive heritage resource), the overall significance of the impact may be found ‘not significant’ in EIA Regulation terms.
- 6.1.28 Table 9.3 of the ES appears to offer an option for a Moderate (and hence *significant*) or Minor (and *not significant*) outcome to be attributed in a low magnitude effect on a national heritage asset. This presents an opportunity for less transparent judgments to be taken. By way of specific example, an assessment on a number of heritage assets (5 SAMs) was requested by the County Archaeologist in the scoping

¹⁰ This was however identified by the LPA in the course of its consideration of the proposals.

stage of the ES. This included Lordenshaw Hillfort (see Technical Appendix, Wingates Viewpoint 15 assessment) 5.5 km north-west of the development site. The assessment considers the magnitude of effect on this nationally important asset as being low, (which is not challenged by this study). However, this is then afforded a *minor significance* impact overall. It is of interest that in this specific incidence the ES has elected to take the *lower* degree of impact as final outcome.

- 6.1.29 Examination of the Heritage Assessment of Wingates ES would suggest overall that a comprehensive approach has been taken to assessing the potential implications of the proposals on the heritage resource potentially affected by the development, although some shortcomings in approach and of its findings have been identified. No impacts upon setting were identified by this study that have not been addressed within the Heritage Assessment with the exception of the Codger Fort example where this study does suggest a moderate, and hence significant effect is evident.

6.2 Wandylaw Wind Farm: Landscape, Visual and Heritage Effects of the Environmental Statement

Wind Farm Profile - Wandylaw	
Location	12km northwest of Alnwick, 3km west of the village of Ellingham on land within the Ellingham Estate
Number of turbines	10
Output (MW)	20-30
Height to hub	80m
Height to blade tip	125m
LPA / Appeal / SoS decision	Appeal
Date of Permission	2009
Date Operational	2013
Full ES / Date	Yes / August 2006



Figure 9- Wandylaw and Middlemoor Wind Farms from Ros Castle
(Photograph by kind permission ©Robert Mayhew)

- 6.2.1 Wandylaw Wind Farm is located approximately 1km west of the tiny hamlet of Wandylaw, 2km west of the A1 and to the immediate north of Middlemoor Wind Farm, at around 190m AOD. It stands within the Smooth Moorland LCT and the

Rosebrough Moor Landscape Character Area¹¹ on a prominent rolling tract of rough grazing and moorland punctuated by several small coniferous plantations.

- 6.2.2 As a consequence of their location, identical turbine specifications and dimensions, Wandylaw and Middlemoor Wind Farms effectively read as a single array from virtually all vantage points.

The planning application for the wind farm was submitted to Berwick upon Tweed Borough Council in August 2006. A full Environmental Statement was prepared.

Landscape and Visual Effects

Methodology

- 6.2.3 The landscape and visual assessment is reported in a chapter of the main ES text, with a separate description of the methodology within an appendix. The general methodology follows the *Guidelines for Landscape and Visual Impact Assessment* (GLVIA) Second Edition 2002 and the Countryside Agency's *Landscape Character Assessment, Guidance for England and Scotland*, 2002. Other assessment guidance documents used include the regional landscape character area descriptions from the Countryside Agency¹² and guidance on landscape effects of wind farms from Scottish Natural Heritage¹³. Descriptions of local landscape types are taken from a 2002 Government Office for the North East project¹⁴.
- 6.2.4 Following scoping, a 25km Zone of Theoretical Visibility (ZTV) was agreed with the council to define the study area. It is noted that the recommended distance of ZTV in SNH guidance at that time¹⁵ (dated 29 March 2006 - thus published eight months prior to publication of the ES – and based on an earlier study in 2002¹⁶) was 35km for turbines 101 – 130 meters high to blade tip. It is not known why a smaller distance was agreed.
- 6.2.5 ZTV graphics were prepared to the full study area radius to illustrate turbine theoretical visibility to hub height and separately to blade tip. Similarly, cumulative ZTVs were prepared to illustrate combined Wandylaw Wind Farm and Middlemoor Wind Farm theoretical visibility. Twelve viewpoints were selected for presentation of detailed visualisations illustrating various combinations of wireframes, existing

¹¹ Northumberland Landscape Character Assessment, 2010

¹² Regional Character Areas are taken from the Countryside Commission/Agency's *The Northumberland Coast Landscape Assessment*, CCP489, 1996, and *Countryside Character Volume 1: North East*, 1998.

¹³ SNH/University of Newcastle (2002) *Visual Assessment of Wind Farms. Best Practice*

¹⁴ Benson, J.F., et al (2002) *Landscape Appraisal for Onshore Wind Development*, Government Office for the North East

¹⁵ SNH (March 2006) *Visual Representation of Wind Farms. Good Practice Guidance*.

¹⁶ SNH/University of Newcastle (2002) *Visual Assessment of Wind Farms. Best Practice*

views and photomontages to show predicted landscape and visual effects. Cumulative wireframes and photomontages were included at four viewpoints.

- 6.2.6 The Technical Appendix sets out the ten selected viewpoints examined by this study from the twelve presented within the ES, and outlines reasons for selection.

Analysis of Viewpoint Assessments

- 6.2.7 The detailed findings of the viewpoint examination are set out at the Technical Appendix. In summary the research found that the generic issues identified in relation to visualisations across the whole study sample were applicable to the Wandylaw case. Further or specific issues identified at Wandylaw include:

- The choice of some 'representative' viewpoints is questioned by this study. A number of viewpoints have been utilised which do not appear to offer the most helpful findings on significance of effects on sensitive receptors. For example, VP10 'Gains Law' on St Cuthbert's Way, appears to have been selected as a consequence of highest elevation on the long distance path, but in practice offers far less helpful views of the turbines than parts of the path to the east of Gains Law;
- Some important viewpoints at key sensitive receptors have not been considered or chosen within the LVIAs. One particular example is the grade 2* Peel Tower at Preston, which lies just east of the A1 and only 3km from the nearest turbines, but is not included in the assessments;
- Significant inconsistency in the accuracy of turbine layout / positioning was noted at some viewpoints but not others, suggesting inconsistency in the accuracy within the same series of visualisations;
- At most viewpoints it was not possible to judge accuracy of turbine layout illustrated on the wireframes and photomontages due not only to distance but also because of the scale of photomontages and lack of visible turbines in the view;

Analysis of Predicted Landscape and Visual Effects

- 6.2.8 A detailed review of the assessment of landscape and visual effects in the ES was carried out for the Wandylaw sample viewpoints (see Technical Appendix). This found that in the large majority of cases assessment of sensitivity of receptors and magnitude of change or effect of the development from the viewpoint were consistently underplayed.
- 6.2.9 Landscape character area descriptions at the national and local scales are used as the basis for the landscape impact assessment, with key character area descriptions and site assessment work used to ascribe levels of landscape quality and sensitivity to change, taking into account the nature of the Wandylaw Wind Farm. Judgements

are made for each character area on a three-point scale of High, Medium and Low landscape quality and sensitivity, although split judgements are made in some cases, such as Medium to High and Medium to Low.

- 6.2.10 The sensitivity of visual receptors is also given on a three-point scale of High, Medium and Low. Three main visual receptor groups are identified as being potentially affected by the wind farm, namely residents, the travelling public, and visitors. The Wandylaw LVIA recognises that within each grouping there will be different levels of sensitivity depending on the location and context of a specific viewpoint and the viewing experience as well as the occupation/pastime of the receptor and the importance of the view. For example the sensitivity of travellers ranges from Medium for road travellers to Low for local residents travelling from A to B where they may be less preoccupied with enjoying the view. It is noted that the visual sensitivity of railway travellers using the route between Lesbury/Alnmouth and Bamburgh is adjudged to be Low, which is questionable given that this is a section of the coastal route passing through the AONB and likely to be used by tourists with a particular interest in enjoying the scenery and likely to be highly sensitive to changes in the view.
- 6.2.11 Magnitude of effects on both the landscape resource and visual receptors is assessed on a four-point scale of High, Medium, Low, and Negligible. The definitions of landscape effects for each point on the scale are considered appropriate with no gaps in the assessment that could underplay the likely magnitude of effects.
- 6.2.12 A matrix is provided to illustrate the extent of potential significant effects on both the landscape resource and visual receptors by correlating the magnitude of anticipated change with the sensitivity of the landscape and visual receptor to the change. The matrix table of significance of landscape / visual impact is reproduced in **Table 5** below (the format, but not the details of the table have been slightly altered to enable direct comparison with the other wind farms reviewed).

Table 5: Significance of Landscape / Visual Impact - Wandylaw

Magnitude of Change	EFFECT SIGNIFICANCE		
High	MODERATE	MAJOR	MAJOR
Medium	MINOR	MODERATE	MAJOR
Low	MINOR	MINOR	MODERATE
Negligible	NEGLIGIBLE	NEGLIGIBLE	NEGLIGIBLE
	Low	Medium	High
	Sensitivity		

- 6.2.13 The Wandylaw LVIA recognises that professional judgement in the field can occasionally require an adjustment to the scale of effect that can result in intermediate grading, for example Major/Moderate.
- 6.2.14 Only landscape and/or visual impacts that are Moderate/Major or Major in significance are deemed equivalent to 'significant' impacts when discussed in terms of the Environmental Impact Assessment Regulations. Major significant effects represent only three correlations within the significance table above out of the total of twelve, but by including the intermediate grading of Major/Moderate another four potential places are added. In this way the methodology enables greater importance to be given to small effects on highly sensitive receptors in accordance with guidance given in GLVIA Second Edition. Thus Low to Medium magnitude of effect on the distinctive and highly sensitive Area of High Landscape Value within which the Wandylaw Wind Farm is located would be assessed as a significant (Major/Moderate) effect.
- 6.2.15 In summary, this study shows that the Wandylaw LVIA methodology generally underplays the overall significance of potential landscape and visual effects of the wind farm in this location. This is partly because the sensitivity of some visual receptors is underplayed in the assessment which conflicts with the criteria adopted, for example the sensitivity of residents and users of public rights of way is assessed as Medium but should be recorded as High in accordance with the description in the methodology. Furthermore, the sensitivity of the landscape to the proposed wind farm is generally underplayed largely because the assessment is undertaken at the national/regional landscape character scale rather than the more detailed local scale. Hence a generalised assessment of Medium sensitivity of the Northumberland Sandstone Hills National Character Area (NCA) is given rather than an assessment at the smaller, local scale (for example the Kyloe and Chillingham Hills landscape character area adjacent to the Rosebrough Moor LCA and lying within the same NCA has High sensitivity to large scale wind farms in accordance with the Northumberland Key Land Use Study 2010, although it is recognised that this study was not available at the time of the Wandylaw application).

Cumulative Landscape and Visual Effects

- 6.2.16 It became apparent during field survey that it was almost impossible to assess the effects of Wandylaw and Middlemoor Wind Farms separately, as reported in the respective ESs, due to the extent of their combined effects whereby the two wind farms effectively read as one from many viewpoints.
- 6.2.17 Only four viewpoints in the Wandylaw ES were included in the cumulative assessment. Significant cumulative effects are recorded at three of these, with

intervening vegetation and topography at viewpoint 1 at the eastern edge of Warenford village off the A1 limiting cumulative effects to negligible. However, there are much clearer views with only a slight deviation from this viewpoint, including views from the A1 from where all 18 Middlemoor turbines plus another 8 turbines within the adjacent Wandylaw Wind Farm are visible.

- 6.2.18 The minimum extent of cumulative assessment in the Wandylaw ES is considered a significant omission. The addition of 18 turbines at Middlemoor Wind Farm immediately adjacent to the 10 turbines at Wandylaw has significantly increased the landscape and visual effects of both developments, but more so the Wandylaw Wind Farm since the majority of turbines within the combined view are those associated with Middlemoor. Whereas significant effects of Wandylaw Wind Farm on its own may be limited to approximately a 4-5km radius, significant cumulative effects with Middlemoor extend this to possibly more than 3 times this distance in some views (as noted at Wandylaw viewpoint No. 5 on Holy Island more than 16km from the wind farm).

Heritage Effects

Methodology

- 6.2.19 A cultural heritage assessment is reported in a chapter of the main ES text, with a separate archaeological desk-based assessment found within an appendix. A further appendix to the ES includes an archaeological setting study which addresses indirect impacts on Scheduled Ancient Monuments (SAM), registered Historic Battlefields and registered Parks and Gardens within 10km of the wind farm. An assessment of a selection of SAMs within a 10-30km radius is also included, together with listed buildings within a 2.5km radius. No justification is given for the adoption of the different radius bands.
- 6.2.20 A figure within the ES shows the location of scheduled ancient monuments, registered parks and gardens, registered historic battlefield (Battle of Homildon Hill) and conservation areas within a 25km radius. Due to the number of sites involved it was agreed with Northumberland County Council at scoping stage that site visits were not required for the setting study and that this should be a desk-based study using the ZVI as a principal means of identifying setting issues. Only a selection of 12 scheduled ancient monuments out of a total of 445 identified in the 10-30km radius band are assessed in the archaeological setting study. These include Hulne Priory, Dunstanburgh Castle, Warkworth Castle and Lindisfarne Priory but not Lindisfarne Castle or Bamburgh Castle.

- 6.2.21 It is noted that the assessment uses Welsh guidance on the issue of the setting of cultural heritage sites due to the absence of English guidance¹⁷.
- 6.2.22 The methodology used in the ES for assessing significance adopts the matrix shown in **Table 6**, where effects are significant, minor or not significant. Only changes of ‘considerable’ magnitude (described in the ES as *the impact on setting that would result in their character or appearance being compromised to the extent that appreciation or understanding is destroyed or substantially reduced*) may result in significant effects. This would appear to be applicable to the impact on the setting of all sites whether they are of local, regional, national or international importance. Moderate effects (described in the ES as *the impact on setting that would result in their character or appearance being compromised to the extent that appreciation or understanding is partially diminished*) on a cultural heritage feature of international importance would not be significant.

Table 6: Wandylaw Heritage Assessment Significance of Impacts Matrix

Importance of Impact	Magnitude of Impact			
	None	Slight	Moderate	Considerable
International	Not significant	Minor	Minor	Significant
National	Not significant	Minor	Minor	Significant
Regional	Not significant	Minor	Minor	Significant
Local	Not significant	Not significant	Minor	Significant

Analysis of Predicted Heritage Effects

- 6.2.23 It is interesting to note the conclusion of the Inspector reporting on the public inquiry (as confirmed by the Secretary of State’s decision). In relation to the indirect effects he suggests that some kind of evaluative framework is necessary, such as the emerging advice from English Heritage encompassing such matters as visual dominance, scale, inter-visibility, vistas and sight lines. In the Inspector’s view, such a framework would begin to offer a basis on which to address the impact of the turbines in relation to the ‘sensitivity’ of the place in which they were to be located. Illustrations within the photomontages led the Inspector to conclude that on the whole, views of the turbines would be too distant and insufficiently dominant to detract from the perception of the coastal castles or parkland. This includes Bamburgh Castle, where the archaeological setting of the structure would not be altered and the turbines would not intrude into the crucial coastal vistas or

¹⁷ ‘Guide to Good Practice on using the Register of Landscapes of Historic Interest in Wales in the Planning and Development Process’. Technical Annex: A Staged Process for the Assessment of the Significance of the Impact of Development on Historic Landscape Areas on the Register of Landscapes of Historic Interest in Wales (ASIDOHL) (Cadw et al 2003) and Simon Colcutt’s ‘The Setting of Cultural Heritage Features’ (1999).

intervene in views towards other coastal castles, Holy Island, Dunstanburgh Castle and the Beadnell Limekilns. The impact of the scheme at all those places would be insignificant or negligible, in his opinion. Such a conclusion is consistent with the landscape and visual assessment (and the findings of the Middlemoor Inspector).

6.2.24 The Inspector accepted that views from Ros Castle would be altered but considered that the turbines would not impinge on the setting of the fort or dominate the structure, nor would their presence alter the perception of how the Iron Age fort might have operated. The turbines would not interrupt the vistas towards Bamburgh and Lindisfarne and, although that would not be so for Dunstanburgh Castle, the dramatic position and scale of that monument would remain evident through the wind farm, he concluded. Views from Hulne Park and Brizlee Tower would be limited and would in any case be a modest adjunct to the Middlemoor Wind Farm that would be closer and would have the greatest visual impact. The Inspector used the photomontages and wire frames to reach this conclusion. In this respect it is highly pertinent to consider the findings of this study in relation to the accuracy of photomontages and wireframes in comparison to observations made of installed turbines. Effects on the setting of cultural heritage features closely correlate to visual effects and puts further and greater emphasis on the need to portray as accurately as possible the likely appearance of the wind farm in planning application material. In underplaying the scale of the turbines in the photomontages studied, the perceived magnitude of effect on views and on the setting of cultural heritage features has also been likely to have been underplayed. There must be reasonable confidence in assuming that a more accurate portrayal of the impacts of the Wandylaw Wind Farm in the ES would almost certainly have led to a different conclusion on the impact on some views and which may have led to the conclusion that there would be a greater effect on the setting of some local cultural heritage features where views are not screened and where there is some historical link with the site.

6.2.25 For example, Preston Tower is a Grade II* Listed Building and a Scheduled Monument located approximately 5.5km from the centre of the site (although the ES records it as being some 9km from the site). A Peel (Pele) Tower, one of 78 in the Northumberland border country built to help defend England from the Scots, with spectacular views from the publically accessible ramparts at the top of the tower. The assessment states that the site will only be affected in terms of the wider historic skyline viewed from the site and as such it is predicted that the indirect impact on its setting will be *slight*. Field work for this study has found that views from the top of the tower to the southwest are now *dominated* by the wind turbines affecting its immediate setting, and consequently a suggested medium-high magnitude resulting in a significant effect should have been attributed.

- 6.2.26 Within the ES moderate impacts on five listed buildings within 2.5km are considered insignificant. In terms of the impact on the setting of sites, these range from slight to moderate impacts seen as being of *Minor significance*, with only one site (cup and ring stones) being significantly impacted by the development.
- 6.2.27 Notwithstanding these observations and prediction of alternative assessments in light of more representative visualisations, these aspects largely reflect conclusions on visual impact, with the material harm identified being slight and outweighed by the benefits of the wind farm. The Inspector concluded that overall the Wandylaw Wind Farm would not cause any unacceptable harm to the cultural heritage or the historic landscape.

6.3 Middlemoor Wind Farm: Landscape, Visual and Heritage Effects of the Environmental Statement

Wind Farm Profile - Middlemoor	
Location	8km northwest of Alnwick, 1km west of North Charlton to the west of the A1
Number of turbines	18
Output (MW)	75
Height to hub	80m
Height to blade tip	125m
LPA / Appeal / SoS decision	Appeal
Date of Permission	2008
Date Operational	2013
Full ES / Date	Yes / November 2005



Figure 10 – Part of Middlemoor Wind Farm

6.3.1 Middlemoor Wind Farm is located approximately 1km west of North Charlton and the A1, and 8km northwest of Alnwick. It stands within the Smooth Moorland LCT and the Rosebrough Moor Landscape Character Area¹⁸ on a prominent rolling tract

¹⁸ Northumberland Landscape Character Assessment, 2010

of rough grazing and moorland punctuated by several small coniferous plantations. It lies immediately south of Wandylaw Wind Farm, at around 210m AOD.

- 6.3.2 As a consequence of their location, identical turbine specifications and dimensions, Middlemoor and Wandylaw Wind Farms effectively read as a single array from virtually all vantage points.
- 6.3.3 The planning application for the wind farm was submitted to Alnwick District Council in November 2005. A full Environmental Statement was prepared.

Landscape and Visual Effects

Methodology

- 6.3.4 The landscape and visual impact assessment (LVIA) is contained within a number of appendices to the ES, the findings of which are reported in a chapter of the main ES text. The general methodology followed in the LVIA *“has evolved bearing in mind past and present guidance and methods of assessment which have been adapted to the requirements of the project”* (Appendix 4 para 4.1.1). Advice contained within the *Guidelines for Landscape and Visual Impact Assessment (GLVIA) First Edition 1995 and Second Edition 2002*¹⁹ are described as being the most relevant, together with the most recent (at that time) regional landscape character area descriptions from the Countryside Commission / Countryside Agency²⁰ and guidance on landscape effects of wind farms from Scottish Natural Heritage²¹. Descriptions of local landscape types are taken from a 2002 Government Office for the North East project²².
- 6.3.5 Following scoping, a 30km Zone of Visual Influence (ZVI) was agreed with the council to define the study area. It is noted that the recommended distance of ZVI/ZTV in SNH guidance at that time²³ was 35km for turbines 101 – 130 meters high to blade tip. It is not known why a smaller distance was agreed.
- 6.3.6 ZVI graphics were prepared to the full study area radius to illustrate turbine theoretical visibility to hub height and separately to blade tip. Similarly, cumulative ZVIs were prepared to illustrate combined visibility of Middlemoor Wind Farm with a number of other existing, consented and proposed wind farms. 18 viewpoints

¹⁹ The Landscape Institute and Institute of Environmental Management and Assessment, *Guidelines for Landscape and Visual Impact Assessment*, First Edition 1995 & Second Edition 2002

²⁰ Regional Character Areas are taken from the Countryside Commission/Agency's *Countryside Character Volume 1: North East*, 1998

²¹ SNH (2001) *Guidelines on the Environmental Impacts of Wind Farms and Small Scale Hydro Electricity Schemes* and SNH/University of Newcastle (2002) *Visual Assessment of Wind Farms. Best Practice*

²² Benson, J.F., et al (2002) *Landscape Appraisal for Onshore Wind Development*, Government Office for the North East

²³ SNH/University of Newcastle (2002) *Visual Assessment of Wind Farms. Best Practice*

were selected for presentation of detailed visualisations using wireframes and photographs of existing views, with photomontages prepared at 9 viewpoints to show predicted landscape and visual effects. Interestingly, at several viewpoints enlarged photomontages were prepared to illustrate the wind farm in greater detail. The analysis of 15 selected viewpoint assessments (see Technical Appendix) notes that in each case the enlarged photomontage offered a much more realistic impression of the actual view than the 'normal' photomontage prepared in accordance with best practice guidance. Cumulative wireframes (not photomontages) were included at three of the viewpoints.

Analysis of Viewpoint Assessments

6.3.7 The detailed findings of the viewpoint examination of a selection of 15 out of the 18 viewpoints in the ES are set out within the Technical Appendix, with an explanation of the reasons for selection. In summary the research found that the generic issues identified in relation to visualisations across the whole study sample were applicable to the Middlemoor case. Further or specific issues identified at Middlemoor include:

- The choice of some 'representative' viewpoints is questioned by this study. A number of viewpoints have been utilised which do not appear to offer the most helpful findings on significance of effects on sensitive receptors;
- Some important viewpoints at key sensitive receptors have not been considered or chosen within the LVIA's. One particular example is the grade 2* Peel Tower at Preston, which lies just east of the A1 and only 3km from the nearest turbines, but is not included in the assessment, yet Middlemoor VP17 was selected around 1km from the tower, but which offered considerably less significant visual impacts from a considerable less sensitive receptor;
- Similarly the iconic coastal heritage feature of Dunstanburgh Castle, lying in the Northumberland Coast AONB is not recognised as a sensitive key receptor, with the LVIA study area of Middlemoor Wind Farm extending to 10km, marginally short of this significant asset;
- Identifying some viewpoints in the field from the recorded grid references proved challenging. In some cases there were significant differences in the grid reference of the ES to that recorded at the viewpoint. In many instances the accuracy of the viewpoint as indicated on the LVIA OS 'thumbnail' location map proved relatively unhelpful. In one case at VP15 the OS extract is out of date as the viewpoint now falls lies within an RAF base;
- Significant inconsistency in the accuracy of turbine layout / positioning was noted at some viewpoints (very significant variation in excess of 150m was noted from VP2 at Cateran Hill) but not others, suggesting inconsistency in the accuracy within the same series of visualisations;

- At the more distant viewpoints it was not possible to judge accuracy of turbine layout illustrated on the wireframes due to distance and the lack of a photomontage.

Analysis of Predicted Landscape and Visual Effects

Landscape Effects

- 6.3.8 With regard to landscape effects, the study noted that in the Middlemoor ES the significance of effect upon the landscape resource is determined by a matrix of landscape resource *quality/value* (rather than *sensitivity*) and the magnitude of effect. Usually landscape value is only one consideration of landscape sensitivity. Criteria are given to describe a three-point scale for quality/value being High, Medium and Low. Areas of High quality/value are generally described as being particularly sensitive to change, where 'Exceptional' is described as being applicable to smaller areas of exceptionally high quality/value or landscapes which, by virtue of the extent of their positive attributes may also be described as exceptional likely to apply to National Parks or Areas of Outstanding Natural Beauty.
- 6.3.9 Areas of Medium quality/value are generally described as being potentially sensitive to change, and which may be valued at more than simply the local scale, for example Areas of High Landscape Value (AHLV)/Special Landscape Areas (SLA).
- 6.3.10 The LVIA suggests that landscape sensitivity is a detailed judgement that can only be arrived at properly after carrying out the assessment, rather than in advance of it. There are generalised descriptions of landscape sensitivity throughout the text but no definitive judgement using a recognised scale (e.g. High/Medium/Low sensitivity) could be found in the LVIA or the ES main text.
- 6.3.11 A four-point scale is used to assess the magnitude of effects on the landscape resource; High, Medium, Low and Negligible. The description of High effects includes the '*introduction of elements **totally uncharacteristic with the attributes of the receiving landscape***' (this study's emphasis). The description of Medium effects includes the '*introduction of elements **that may be prominent but may not necessarily be substantially uncharacteristic with the attributes of the receiving landscape***' (this study's emphasis). It is considered that there is an important gap in these criteria that precludes the assessment of elements that are **substantially uncharacteristic** with the receiving landscape i.e. lying somewhere between the High and Medium criteria. This has the potential to underplay the landscape impact of wind turbines and consequently the significance of effects.
- 6.3.12 A matrix is provided to show the significance of effect on the landscape resource, being determined by correlating the quality/value of the resource (using the three-point scale) with magnitude of effect (using the four-point scale). **Table 7**

reproduces Table 2 ‘Significance of Effect upon the Landscape Resource – Matrix’ from the LVIA:

Table 7: Significance Matrix of Effect upon the Landscape Resource – Middlemoor

Effect Magnitude	EFFECT SIGNIFICANCE		
	High	MODERATE	MODERATE/MAJOR
Medium	LOW/MODERATE	MODERATE	MODERATE/MAJOR
Low	LOW	LOW/MODERATE	MODERATE
Negligible	NEGLIGIBLE/LOW	LOW	LOW/MODERATE
	Low	Medium	High
	Landscape Resource Quality/Value		

6.3.13 Only those effects indicated as being of Major and Moderate/Major significance in the table above are regarded in the LVIA as likely to be equivalent to ‘significant’ impacts when discussed in terms of the Environmental Impact Assessment Regulations (although the regulations and Directive do not define ‘significance’). This represents only three points within the significance table out of the total of twelve (i.e. 25%). Each category should be clearly defined (in accordance with GLVIA) but no definitions are given. Furthermore, guidance within the GLVIA Second Edition 2002, which is repeated in the LVIA (Appendix 4 paragraph 4.3.13), states that “A higher level of significance is generally attached to large-scale effects and effects on sensitive or highly-valued receptors; **thus small effects on highly sensitive sites can be more important than large effects on less sensitive sites** (this study’s emphasis). *It is therefore important that a balanced and well-reasoned judgement of these two criteria is achieved*”²⁴. In the significance matrix only Medium magnitude of effects on a landscape resource of High quality/value and High magnitude of effects on a landscape resource of Medium or High quality/value are considered to be significant effects. Thus important smaller effects (in terms of GLVIA) of Low magnitude on a landscape resource of High quality/value and Medium effects on a landscape resource of Medium quality/value are not considered ‘significant’ in the LVIA. According to criteria in the LVIA the partial loss/moderate alteration to key elements/features within an Area of High Landscape Value within which the Middlemoor Wind Farm is located (a local landscape designation defined by Alnwick District Council and neighbouring Berwick-upon-Tweed Borough Council) are not considered ‘significant’.

²⁴ GLVIA Second Edition, 2002, para 7.39

Visual Effects

- 6.3.14 With regard to visual effects, the Middlemoor ES adopts a similar matrix to correlate magnitude of effect and the sensitivity of visual receptors (i.e. viewers) to arrive at a judgement on the significance of visual effects. As in the assessment of landscape effects, magnitude of visual effects is considered on a four-point scale, High, Medium, Low and Negligible. The description of High magnitude of effect includes the '*complete or very substantial obstruction of existing view or **complete change in character and composition of baseline***' (this study's emphasis). The description of Medium magnitude of effect includes the '*partial obstruction of existing view or **partial change in character and composition of baseline***' (this study's emphasis). There is an important gap in these criteria that precludes the assessment of a change in character and composition of the baseline situation that lies between the High and Medium criteria i.e. more than partial change but less than complete change. This has the potential to underplay the visual impact of wind turbines and consequently the significance of effects.
- 6.3.15 In accordance with recognised good practice guidance in GLVIA, different groups of visual receptors are afforded differing levels of sensitivity, ranging from High, Medium to Low. This study notes that in the Middlemoor LVIA, visual impact assessment is undertaken only for the two highest sensitive groups (Appendix 4 paragraph 4.4.3). Travellers are afforded Low sensitivity (together with users of indoor facilities and people working indoors) and are thus excluded from the assessment. This is despite GLVIA suggesting that travellers in cars, on trains or other transport routes are likely to be in the Medium category. This also has the potential to underplay the visual impact of wind turbines and consequently the significance of effects.
- 6.3.16 Significance of visual effects is tabulated in matrix form in the same way as in the assessment of significant landscape effects. Magnitude of effect (using the four-point scale) is correlated against receptor sensitivity (on the three-point scale). As with the assessment of landscape effects, only those effects indicated as being of Major and Moderate/Major significance are regarded in the LVIA as likely to be equivalent to 'significant' impacts. In the LVIA only Medium magnitude of effects on visual receptors of High sensitivity, and High magnitude of effects on visual receptors of Medium or High sensitivity are assessed as significant effects. Thus a High magnitude of effect (defined in the LVIA as a complete change or very substantial change in view) on visual receptors with Low sensitivity (i.e. travellers) would result in a Moderate level of significance in the matrix and below the threshold considered 'significant' in the LVIA. Again this has the potential to underplay the significance of visual effects on a large range of travellers with views of the wind farm.

6.3.17 In summary, this study shows that the Middlemoor LVIA methodology generally underplays the overall significance of potential landscape and visual effects of the wind farm in this location. A number of effects on the landscape resource and views are assigned Moderate significance (and thus 'not significant') as a result of underplaying the sensitivity of the receptor and/or the magnitude of effect. This is partly due to the criteria adopted which preclude the assessment of effects lying between the High and Medium scales which would have provided a more realistic assessment of significant effects.

Cumulative Effects

6.3.18 A very brief assessment of potential cumulative effects is included in the ES. A number of potentially relevant wind farm schemes were initially considered within a 60km study area. Most were rejected due to distance leaving three operational or approved schemes within approximately 20km from Middlemoor Wind Farm. Whilst limited potential cumulative effects were predicted principally on occasional views from travellers moving through the landscape and from some fixed viewpoints in the wider landscape, none were considered significant.

6.3.19 Interestingly, Wandylaw Wind Farm immediately adjacent to Middlemoor was not assessed separately because it would share substantively the same ZVI as Middlemoor. Fieldwork for this study has shown that it was almost impossible to assess the effects of Wandylaw and Middlemoor Wind Farms separately, as reported in the respective ESs, due to the extent of their combined effects whereby the two wind farms effectively read as one from many viewpoints.

6.3.20 The minimum extent of cumulative assessment in the Middlemoor ES is considered a significant omission. Although the Middlemoor ES was submitted prior to the Wandylaw application, Wandylaw was at the scoping stage and thus should have been included in an assessment of cumulative effects. The addition of 10 turbines at Wandylaw Wind Farm immediately adjacent to the 18 turbines at Middlemoor has significantly increased the landscape and visual effects of both developments (but more so the Wandylaw Wind Farm since the majority of turbines within the combined view are those associated with Middlemoor). Whereas significant effects of Middlemoor Wind Farm on its own may be limited to approximately a 4-5km radius, significant cumulative effects with Wandylaw extend this to possibly more than 3 times this distance in some views (as noted at Wandylaw viewpoint No. 5 on Holy Island more than 16km from the wind farm).

Heritage Effects

Methodology

- 6.3.21 Chapter 12 of the ES addresses Cultural Heritage. A table of designated features is included at Appendix 15 of the ES Volume 3, listing scheduled monuments, listed buildings and registered historic parks and gardens within 7km of the wind farm, in addition to those raised as potential receptors by English Heritage (it is noted that the list includes features up to 9.15km from the nominal centre point of the wind farm).
- 6.3.22 The location of scheduled monuments and listed buildings are shown in relation to the theoretical ZVI within a 10km radius. Registered parks and gardens are shown on a separate drawing showing landscape planning designations. It is noted that the location of conservation areas are not illustrated in the ES.
- 6.3.23 The cultural heritage and landscape and visual assessment chapters are cross-referenced in terms of effects on heritage features. Principal recreational receptors shown include Holy Island, the Farne Islands, Bamburgh Castle, Dunstanburgh Castle, Warkworth Castle, Edlingham Castle, Alnwick Castle and Garden, Chillingham Park, Hulne Park (including the Priory and Abbey), Howick Hall, Ros Castle and Cragside. These are all included as 'individual attractions/areas' in the LVIA where they are considered in terms of their contribution to landscape value and quality.
- 6.3.24 The LVIA chapter summarises effects on the valued landscape resource and landscape quality with reference to sites of archaeological importance, historic buildings, gardens and designed landscapes, conservation areas and the historic landscape in general. It is acknowledged in the ES that significant visual effects would arise with respect to a number of nationally and locally important features but that this in itself would not necessarily significantly diminish the scope to appreciate the elements in their own right or their relationship with their settings as judged 'in the round'. Significant effects on views from some local historic buildings would occur but it is considered in the ES that the opportunity to appreciate that which has been listed or designated would not be unacceptably affected.
- 6.3.25 Drawing from the Cultural Heritage assessment, the ES states that it is important to appreciate that the Middlemoor landscape is not 'natural' in the sense that it has remained untouched by humankind. It has been a working landscape over the course of thousands of years and remains so today albeit with a completely different appearance from that which prevailed in the periods exemplified by the Scheduled Ancient Monuments. The presence of the wind farm is considered sufficiently separate physically and in the *time-depth* sense such that the valued elements would not be perceived as being 'out-competed' or demeaned by the turbines. Furthermore, according to the ES, the turbines would add something

symbolic which would not be out of keeping with the landscape's scale, structure or its historic and prehistoric antecedents. The ES states:

“While constructed of modern materials, the wind farm would nonetheless stand as a symbol of a way forward; sentinels pointing in the direction of a more sustainable future whilst the valued elements within the historic landscape would continue to act as sentinels over the remains and memories of the past....The archaeological experience would be substantially conserved and through the intermixture of past, present and well-designed future symbolism, the cultural landscape experience would be extended and potentially enhanced in this regard. As such, the genus loci would be at least maintained and in some ways added to without overwhelming those more deeply involved in seeking to understand the past and its landscape context”.

6.3.26 This statement can be seen to rather poetically suggest that the proposals would present a new but separate and distinguishable element of the evolution of the historic landscape, and this study does not challenge that conclusion in isolation. However, significant impacts of the proposals upon the settings and inter-visibility across a significant spectrum of the characteristic and unique heritage assets in this part of Northumberland are clearly evident, and the principle of being sufficiently modern in appearance – whilst distinguishing from historic assets, can only be taken so far without acknowledging harm. Middlemoor Wind Farm (now seen in complete singularity with Wandylaw Wind Farm) abruptly interrupts views from Ros Castle and Cateran Hill (as important historic sites located in part because of their lookout attributes) towards the coastal strip, with the line-of-sight to Dunstanburgh particularly affected. Vistas from Preston Tower, again important for its look-out function, are dramatically interrupted by turbines from both wind farms, and in the opinion of this study, to a significantly greater degree than suggested within the ES.

6.4 Kiln Pit Hill Wind Farm: Assessment of Landscape & Visual Effects and Heritage Effects in the Environmental Statement

Wind Farm Profile – Kiln Pit Hill	
Location	1km east of the A68, 3km north of Consett and immediately north of a minor road between the small hamlets of Kiln Pit Hill, Unthank and Shotleyfield.
Number of turbines	6
Output (MW)	12MW
Height to hub	65m
Height to blade tip	100m
LPA / Appeal / SoS decision	Appeal
Date of Permission	February 2009
Date Operational	2012
Full ES / Date	Yes / 2005



Figure 11- Kiln Pit Hill Wind Farm

6.4.1 Kiln Pit Hill Wind Farm is located immediately to the north of an unclassified minor road between the small hamlets of Kiln Pit Hill, Unthank and Shotleyfield, 1km east of the A68 and approximately 3km north of Consett. It lies at approximately 240m

AOD within the Coalfield Upland Fringe LCT and Kiln Pitt Hill Hinterland LCA²⁵ on gently rising arable land and woodland above the Derwent Valley. The North Pennines AONB lies some 1.8km to the west, beyond the A68. Boundary Lane Wind Farm lies approximately 2km to the north east.

- 6.4.2 A planning application for the wind farm was submitted to Tynedale District Council in December 2005. A full Environmental Statement was prepared to accompany the application. Following consultations and representations, in particular from English Heritage with regard to concerns over potential impacts on the setting of St. Andrew's Church and Hopper Mausoleum on nearby Greymare Hill (addressed further below), further visual analysis was submitted in May 2007 prior to the Public Inquiry in 2008.

Landscape and Visual Effects

Methodology

- 6.4.3 A detailed methodology for the LVIA is set out in an appendix to the ES. The assessment is reported in a chapter of the ES, with a summary of the method. It notes methodology was developed reflecting up-to-date guidance including GLVIA Second Edition (2002)²⁶ and publications produced by the Countryside Agency. A number of other documents are referenced as being used in the desk study to establish the baseline landscape and visual situation and to inform the assessment, including a landscape appraisal for onshore wind development at the regional scale and a local study on the landscape capacity of the Kiln Pit Hill area to accommodate wind farm development. The area of the Kiln Pit Hill Wind Farm was found to be capable of accommodating a small wind farm of up to 7.5MW or less than 4 turbines.
- 6.4.4 The assessment follows normal convention, considering the baseline situation, identifying sensitive receptors, the magnitude of impacts as a result of the wind farm, and significant effects.
- 6.4.5 Following scoping, a 30km Zone of Theoretical Visibility (ZTV) was agreed with the council to define the study area. It is noted that the recommended distance of ZTV in SNH guidance at that time²⁷ was 35km for turbines 101 – 130 meters high to blade tip. It is not known why a smaller distance was agreed.

²⁵ Northumberland Landscape Character Assessment, 2010.

²⁶ The Landscape Institute and Institute of Environmental Management and Assessment, *Guidelines for Landscape and Visual Impact Assessment*, Second Edition 2002

²⁷ SNH/University of Newcastle (2002) *Visual Assessment of Wind Farms. Best Practice*

- 6.4.6 ZTV graphics were prepared to the full study area radius to illustrate turbine theoretical visibility to hub height and separately to blade tip. Similarly, cumulative ZTVs were prepared to illustrate combined visibility of Kiln Pit Hill Wind Farm with a number of other existing, consented and proposed wind farms. Nineteen viewpoints were selected for presentation of detailed visualisations in the ES using wireframes and photographs of existing views, with photomontages prepared at 10 viewpoints to show predicted landscape and visual effects within 10km of the site. Enlarged photomontages were also prepared to illustrate the wind farm in greater detail from the same 10 viewpoints. The analysis of 11 selected viewpoint assessments (see Technical Appendix) notes that in each case the enlarged photomontage offered a much more realistic impression of the actual view than the 'normal' photomontage prepared in accordance with best practice guidance. Cumulative wireframes (without photomontages) were included at three of the viewpoints.
- 6.4.7 Five additional viewpoints were included in a separate assessment of likely effects on views from St. Andrew's Church and Hopper Mausoleum on nearby Greymare Hill. A combination of wireframes, photographs of existing views, photomontages and enlarged photomontages were submitted. Again, in each case the enlarged photomontage offered a much more realistic impression of the actual view than the 'normal' photomontage prepared in accordance with best practice guidance.

Analysis of Viewpoint Assessments

- 6.4.8 The detailed findings of the viewpoint examination of the selection of 11 out of the 19 viewpoints in the ES, plus the 7 additional viewpoints at Greymare Hill, are set out in the separate Technical Appendices document, with an explanation for the reasons for selection given at **Appendix A1**. In summary the research found that the generic issues identified in relation to visualisations across the whole study sample were applicable to the Kiln Pit Hill case. Further or specific issues identified at Kiln Pit Hill include:
- The choice of some 'representative' viewpoints is questioned by this study. A number of viewpoints have been utilised which do not appear to offer the most helpful findings on significance of effects on sensitive receptors with some views partially obscured by buildings, vegetation or topographic features;
 - More appropriate viewpoints should have been included in the assessment, for example from the edge of the AONB and from within a number of nearby conservation areas;
 - Identifying some viewpoints in the field from the recorded grid references proved challenging. In some cases there were significant differences in the grid reference of the ES to that recorded at the viewpoint. In many instances

the accuracy of the viewpoint as indicated on the LVIA OS ‘thumbnail’ location map proved relatively unhelpful;

- Turbine layout illustrated in the wireframes and photomontages was found to be relatively accurate, but consistently underestimate the scale of all features in the view. The enlarged photomontages were found to be much more representative of the actual view;
- At the more distant viewpoints it was not possible to judge accuracy of turbine layout illustrated on the wireframes due to distance and the lack of a photomontage.

Analysis of Predicted Landscape and Visual Effects

6.4.9 A detailed review of the assessment of landscape and visual effects within the ES was carried out for the Kiln Pit Hill sample viewpoints (see Technical Appendix). This found that generally the likely effects are underplayed.

6.4.10 The same four-point scale is used to assess separately landscape sensitivity and magnitude of change for both landscape and visual effects; High, Medium, Low and Negligible. A significance matrix for both landscape and visual effects is provided showing the effects of combining sensitivity of receptors and the magnitude of change. This is reproduced in **Table 8** below:

Table 8: Evaluation of Landscape and Visual Effects – Kiln Pit Hill

Magnitude of Change				
High	SLIGHT/MODERATE	MODERATE	MODERATE / SUBSTANTIAL	SUBSTANTIAL
Medium	SLIGHT	SLIGHT/ MODERATE	MODERATE	MODERATE / SUBSTANTIAL
Low	NEGLIGIBLE	SLIGHT	SLIGHT/ MODERATE	MODERATE
Negligible	NEGLIGIBLE	NEGLIGIBLE	SLIGHT/ NEGLIGIBLE	SLIGHT
	Negligible	Low	Medium	High
	Landscape and Visual Sensitivity			

6.4.11 Only those effects indicated as being of Substantial and Moderate/Substantial significance highlighted in the table above are regarded in the LVIA as likely to be equivalent to ‘significant’ impacts when discussed in terms of the EIA Regulations. This represents only three points within the significance table out of the total of sixteen. Only Medium magnitude of effects on a landscape or visual receptor of High sensitivity and High magnitude of effects on landscape and visual receptors of Medium or High sensitivity are considered to be significant effects. Thus important smaller effects (in terms of GLVIA) of Low magnitude on a landscape or visual

receptor of High sensitivity and Medium effects on a landscape or visual receptor of Medium sensitivity are not considered 'significant' in the LVIA.

- 6.4.12 Technical Appendix E of the ES is the viewpoint assessment. For each viewpoint an assessment of sensitivity and magnitude of change are recorded, together with an overall 'Level of Effect' assumed to refer to significance of effect. The viewpoint assessment also records the nature of effect (referred to as 'Type of Effect') as required by the EIA regulations, in terms of whether effects are long or short term, temporary (reversible) or permanent, direct or indirect, positive, negative or neutral. It is noted that all visual effects are described as neutral, meaning that the wind farm "*may be reasonably accommodated within the scale and character of the landscape as perceived from a receptor location*" as explained in Technical Appendix C. This simply cannot be the case from each viewpoint and is not substantiated by the findings of the assessment.
- 6.4.13 The viewpoint assessment identifies only 8 viewpoints where visual effects would be significant. These are within 3.3km of the wind farm, although the ES suggests that significant landscape and visual effects could extend to a distance of 5km. This study has found that likely significant effects could extend beyond 6km and possibly up to a distance of 10km, indicating the extent to which likely significant effects are underplayed in the ES.
- 6.4.14 The assessment considers potential effects on a number of receptors including landscape character areas, residential properties, settlements, roads and other routes, listed buildings and cultural heritage features, recreational and tourist sites, designated landscapes including the National Park, AONB and historic parks and gardens. Although the list appears extensive, additional significant effects are experienced from a number of other residential properties including some in Shotleyfield and on the edge of Consett above the Derwent valley, a number of routes across Muggleswick Common, limited parts of the northern edge of the AONB (less than 2km from the site), and on the setting of St. Andrew's Church and Hopper Mausoleum at Greymare Hill (although significant effects from the public footpath at Greymare Hill is acknowledged; impacts on these latter receptors is considered further in the heritage assessment below).

Cumulative Landscape and Visual Effects

- 6.4.15 The assessment of cumulative effects follows a detailed methodology. Impacts are assessed by identifying existing and approved wind farms within 60km of the site. Three cumulative assessment viewpoints are included, illustrated with panoramic photographs and wireframes and included in the assessment in *Technical Appendix F*.

- 6.4.16 The assessment in Technical Appendix F concludes that of the three cumulative viewpoints only that on the B6318 Military Road, adjacent to Hadrian's Wall, could be significantly affected if a number of wind farms to the north are approved. An assessment of the effects at this cumulative viewpoint No. 3 is (see Technical Appendix), which shows that a number of turbines at Green Rig and Kirkheaton Wind Farms are visible, but at the time of survey Kiln Pit Hill Wind Farm could not be seen. This study found that cumulative landscape effects are not significant but that there is a significant cumulative visual effect from this viewpoint, in agreement with the assessment in the ES. The cumulative effects are primarily on views from the road and from the Hadrian's Wall long distance national trail.
- 6.4.17 The LVIA in chapter 7 of the ES acknowledges that there could be sequential cumulative effects in views as travellers pass along the A68 (north and south of the A69), the B6318 tourist route, the B6278 road through the AONB, and the national cycle route No. 7 as it passes Hisehope Hill and over Muggleswick Common. Interestingly no potential significant effects of Kiln Pit Hill Wind Farm (without other wind farms) are assessed along any of these routes.

Heritage Effects

Methodology

- 6.4.18 Cultural heritage assessment is reported in chapter 12 of the ES. The method of approach was agreed with Northumberland County Council. A desk-based assessment and walkover field survey were undertaken to enable an assessment of direct effects within a detailed study area of 500m. A wider 'extended study area' of 7km was used to assess indirect effects on the setting of designated features.
- 6.4.19 Assessment of significance of an effect on cultural heritage features is considered a product of its importance in policy terms (national, regional, local) and the magnitude of effect. Features of national importance are described as Scheduled Monuments and Grade I and Grade II* listed buildings. The assessment makes no distinction between features of regional and local importance; conservation areas and Grade II listed buildings are described as being of regional or local importance and registered parks and gardens as international, national, regional or local importance.
- 6.4.20 Criteria are provided to describe a 4-point scale of magnitude of effect from High, Medium, Low and Negligible, referring to the amount of loss or alteration to a feature and change to a feature's setting. **Table 9** below reproduces the definition of magnitude in the assessment:

Table 9: Definition of Magnitude Table

Magnitude of Effect	Definition
High	Total or substantial loss of a feature or complete loss of the characteristics of a feature’s setting.
Medium	Partial loss or alteration of a feature. Substantial change to the key characteristics of a feature’s setting, or a more total loss which is temporary and/or reversible.
Low	Minor loss or alteration of a feature. Changes to a setting which does not affect the key characteristics, or which is short term and reversible.
Negligible	Minor alteration of a feature. Minor and short term or very minor and reversible changes to its setting which do not affect the key characteristics.

6.4.21 A significance matrix is also provided, reproduced in **Table 10** below:

Table 10: Heritage Assessment Significance Matrix – Kiln Pit Hill

Magnitude of Effect	Policy Importance		
	National	Regional	Local
High	Major	Major	Minor
Medium	Minor	Minor	Minor
Low	Minor	Minor	Not Significant
Negligible	Not Significant	Not Significant	Not Significant

6.4.22 Significant can be seen to be considered only Major, Minor or not significant. This would suggest that minor changes are considered significant, but the assessment suggests that for this assessment only changes of high magnitude may result in effects of Major significance. This is confusing and suggests that potentially significant effects are likely to be underplayed, for example medium effects (i.e. partial loss or alteration of a feature or substantial change to its setting) on features of regional and national importance are normally considered significant (moderate significance).

Analysis of Predicted Heritage Effects

- 6.4.23 There is no reasoning behind the 7km distance adopted as the extended study area. It is questioned since the ZTV extends beyond 20km. Hadrian's Wall World Heritage Site lies between 10km and 20km from the wind farm and from where the wind farm is visible (as confirmed in the assessment of impact on view point 18 on the B6318 east of the A68 roundabout close to the Hadrian's Wall long distance national trail).
- 6.4.24 Figure 12.2 'Designated Features of Cultural Heritage Interest within 7km of the Site' only shows Scheduled Monuments and listed buildings. There are 2 historic parks and gardens and a number of conservation areas within this distance.
- 6.4.25 There are several conservation areas within the 7km extended study area, including Shotley Bridge and Ebchester between 3km-4km to the east. These are located on rising ground above the River Derwent and overlook the hill fringe on the northern side of the Derwent valley where Kiln Pit Hill Wind Farm is located. Blackhill Conservation Area lies in a similar location within Consett but is not mentioned in the assessment. The assessment suggests that at these distances impact on the setting of conservation areas is more relevant to discussion of designated features incorporated within them such as listed buildings. The assessment fails to address the importance of the setting and views from these conservation areas, the elevated position offering impressive views, vistas and glimpses over the countryside to the north and west as described in the Conservation Area Appraisals. Open farmland interspersed by pockets of woodland surround the villages on all sides and form a backdrop to views into, out of and through the villages and contribute to the pronounced rural character. Turbines at Kiln Pit Hill Wind Farm are visible in views from key locations within the conservation areas which should have been included in the LVIA as key viewpoints.
- 6.4.26 The assessment of effects on the complex of nine listed buildings at Greymare Hill, including the Grade I Hopper Mausoleum and Grade II St. Andrew's Church on a prominent hill less than 1km from the wind farm was the subject of an objection by English Heritage (EH), particularly with regard to impacts on their setting. This was the main issue at the Public Inquiry into the appeal against the decision of Tynedale District Council, in particular EH questioning the assessment of minor significance of effect (conflicting with the LVIA which found that there would be significant visual effects on visitors to Greymare Hill and on the local landscape at Kiln Pit Hill and surroundings within the Area of High Landscape Value). In allowing the appeal the Inspector concluded on this issue that although the development would have a significant adverse impact on some views of the buildings and their setting, it would be more limited in most views because of the relative ground levels and separation distances. The listed buildings would continue to be appreciated in their dominant

and isolated hilltop position from many viewpoints, in his opinion. The development is also reversible, and whilst there is residual harm the Inspector weighed this with the benefits of the development including benefits of addressing climate change (which also include benefits to the wider cultural heritage).

6.5 Boundary Lane Wind Farm: Assessment of Landscape & Visual Effects and Heritage Effects in the Environmental Statement

Wind Farm Profile – Boundary Lane	
Location	Approximately 2.5km west of Ebchester and 3km north of Consett
Number of turbines	3
Output (MW)	6MW
Height to hub	69m
Height to blade tip	115m
LPA / Appeal / SoS decision	LPA
Date of Permission	March 2011 & March 2012
Date Operational	2013
Full ES / Date	Yes / May 2009, supplementary info. 2010 & ES Addendum October 2011



Figure 12 -Boundary Lane Wind Farm (foreground) with Kiln Pit Hill Wind Farm in the same vista.

- 6.5.1 Boundary Lane Wind Farm is located approximately 2.5km west of Ebchester and 3km north of Consett. The minor unclassified Boundary Lane road runs immediately south of the site, and the B6309 runs to the north, separated from the wind farm by Old Wood and agricultural fields. The site lies at approximately 225m AOD within

the Coalfield Upland Fringe LCT²⁸ on gently rising arable land amongst a patch work of woodland and plantations above the Derwent Valley. The North Pennines AONB is approximately 4.5km to the west. Kiln Pit Hill Wind Farm lies approximately 2km to the south west.

- 6.5.2 A planning application for a wind farm comprising 3 No. turbines 69m high to hub and 110m high to blade tip was submitted to Northumberland County Council in May 2009. A full Environmental Statement was prepared to accompany the application that was approved in March 2011. The applicant, Wind Prospect Developments Ltd., subsequently applied to increase the diameter of the rotor blades from 82m to 92m and therefore the total turbine height to 115m. An ES Addendum was submitted to assess the environmental effects of the proposed changes, which were approved in March 2012.

Landscape and Visual Effects

Methodology

- 6.5.3 A detailed methodology for the LVIA is set out in appendix 7 to the original ES. The assessment is reported in a chapter of the main ES, with landscape and visual effects of the increased height of the blades reported in a separate chapter in the EA Addendum (the assessment concludes that there would be no change in the landscape and visual effects reported in the initial ES accompanying the application for the shorter turbines).
- 6.5.4 The methodology followed guidance in GLVIA Second Edition (2002)²⁹ and guidelines on landscape character assessment³⁰. However an unconventional approach is adopted, justified by a lengthy critique of guidance on LVIA and cumulative effects available at that time and considering that there are five other operational and three approved wind farms within 20km of Boundary Lane. Various scenarios are assessed incorporating one or more of the operational and permitted schemes in the baseline description, the LVIA and a cumulative assessment of the effects of the Boundary Lane Wind Farm. The assessment confuses the LVIA of the Boundary Lane Wind Farm on the baseline situation with a cumulative assessment. There is no cumulative assessment reported in the ES. The normal convention is to include operational schemes and those in construction within the baseline description and assessment of landscape and visual effects, with these schemes and other permitted schemes included in an assessment of potential cumulative effects resulting from the addition of the proposed scheme. The approach adopted in the

²⁸ Northumberland Landscape Character Assessment, 2010.

²⁹ The Landscape Institute and Institute of Environmental Management and Assessment, *Guidelines for Landscape and Visual Impact Assessment*, Second Edition 2002

³⁰ Scottish Natural Heritage and the Countryside Agency, *Landscape Character Assessment Guidance for England and Scotland*, 2002

Boundary Lane LVIA results in underplaying the likely effects of the wind farm on the baseline landscape and views by considering only the additional cumulative effects of the Boundary Lane Wind Farm and not the combined effect.

- 6.5.5 A number of other documents are referenced as being used in the desk study to establish the baseline landscape and visual situation and to inform the assessment, including a landscape appraisal for onshore wind development at the regional scale and a local study on the landscape capacity of the Kiln Pit Hill area to accommodate wind farm development. The area of the Boundary Lane Wind Farm was found to be capable of accommodating a small wind farm of up to 7.5MW or less than 4 turbines.
- 6.5.6 The assessment follows normal convention, considering the baseline situation, identifying sensitive receptors, the magnitude of impacts as a result of the wind farm, and significant effects.
- 6.5.7 A 20km Zone of Theoretical Visibility (ZTV) was agreed with Tynedale Council (the determining local planning authority prior to reorganisation in April 2009) to define the study area. It is noted that the recommended distance of ZTV in SNH guidance at that time³¹ was 35km for turbines 101 – 130 meters high to blade tip. A 20km study area was considered to contain the main receptors with the potential to be affected by the Boundary Lane proposal.
- 6.5.8 ZTV graphics were prepared to the study area radius of 20km to illustrate turbine theoretical visibility to hub height and separately to blade tip of the Boundary Lane Wind Farm. A combined ZTV of Boundary Lane with 7 other operational wind farms is also included in the ES. Similarly, cumulative ZTVs were prepared to illustrate combined visibility of Boundary Lane Wind Farm with a number of other consented and proposed wind farms in various combinations. Eighteen representative viewpoints were selected for presentation of detailed visualisations in the ES (from a total of 37 viewpoints initially considered and visited) using wireframes and photographs of existing views, with photomontages prepared at 8 viewpoints to show predicted landscape and visual effects within approximately 7km of the site.

Analysis of Viewpoint Assessments

- 6.5.9 The detailed findings of the viewpoint examination of the selection of 10 out of the 18 viewpoints in the ES are set out within the Technical Appendix, with an explanation of the reasons for selection. In summary the research found that the generic issues identified in relation to visualisations across the whole study sample

³¹ SNH (2006) *Visual Representation of Wind Farms Good Practice Guidance*

were applicable to the Boundary Lane case. Further or specific issues identified at Boundary Lane include:

- All viewpoints were easily identified in the field;
- Turbine layout illustrated in the wireframes and photomontages was found to be relatively accurate, but consistently underestimate the scale of all features in the view;
- At the more distant viewpoints it was not possible to judge accuracy of turbine layout illustrated on the wireframes due to distance and the lack of a photomontage;
- Sensitivity of some visual receptors is underplayed, for example walkers are assessed as having medium sensitivity whereas the convention is to assign these receptors as highly sensitive. This results in underplaying some effects. For example at viewpoint 3 Hopper Mausoleum tourists / visitors to St. Andrew's Church are assigned high sensitivity but walkers on the same route only Medium sensitivity. A medium magnitude of change results in a significant effect on tourists/visitors but a not significant effect on walkers.

Analysis of Predicted Landscape and Visual (including Cumulative) Effects

6.5.10 A review of the assessment of landscape and visual effects within the ES was carried out for the Boundary Lane sample viewpoints (see Technical Appendix). This found that no specific assessment of landscape sensitivity, magnitude of effects on the landscape or significance of landscape effect is provided at the viewpoints. A general statement of effect on wider landscape character is given which generally underplays the impact, in most cases, for example, relying on the argument that only a small part of a wider landscape character area would be significantly affected. In general the assessment of landscape effects is difficult to follow and unclear, often seeming to confuse effects on landscape character with visual effects. Effects on landscape character are given, for example 'slight/negative' but no criteria provided to explain and justify the judgement made. The visual assessment is thorough and takes into consideration likely effects on a range of receptors within the ZTV including views from settlements and individual properties, leisure and recreational facilities, main 'A' roads, 'B' roads and unclassified routes, railway and users of the PRow network. It acknowledges, for example, that views of the turbines would be available from a number of parts of Consett, which fieldwork for this study has confirmed.

6.5.11 The LVIA is very thorough but is considered too complicated and not in accordance with GLVIA. 'Location sensitivity' (rather than receptor sensitivity which is the usual assessment made) is judged on a 5-point scale of High, High/Medium, Medium, Medium/Low and Low. Residential receptors are judged as either High, High/Medium or Medium sensitivity depending on the direction of view and its

location (main windows, garden and driveway, nearby pavement). Guidance in GLVIA is that all residents with views are assessed as highly sensitive (wherever the private view is taken from). The sensitivity of recreational receptors is adjudged according to the status of the route they are using, thus walkers on a nationally designated route are assessed as highly sensitive whilst those using the local rights of way network are judged as Medium sensitivity. Guidance suggests they should all be of High sensitivity. The effect of following this method is to underplay the sensitivity of receptors which inevitably leads to the underplaying of significance of effects.

- 6.5.12 The assessment of the magnitude of change in each view is also too complicated. Nine categories of magnitude are given with definitions for each, but the differences are minor producing too fine an assessment, as shown in **Table 11** below:

Table 11 : Definitions of Magnitude of Change

Category of Magnitude of Change	Definition (abridged)
Very substantial	The proposal will be dominant
Very substantial/substantial	The proposal will be highly prominent
Substantial	The proposal will be prominent
Substantial/moderate	The proposal will be clearly visible
Moderate	The proposal will be a visible element
Moderate/slight	The proposal will be clearly noticeable
Slight	The proposal will be noticeable
Slight/negligible	The proposal will be discernible
Negligible	The proposal will be barely discernible

- 6.5.13 A significance matrix is provided by combining the sensitivity of the location with the predicted magnitude of change which inevitably, given the fine grain of assessment, is in turn too complicated with a possible 45 categories of effect. Guidance in GLVIA suggests a 4-point scale would be appropriate (for example Major, Moderate, Minimum and Negligible). The significance matrix in the Boundary Lane LVIA is reproduced in **Table 12** below:

Table 12: Assessment of overall effects on visual receptors – Boundary Lane Wind Farm

Location Sensitivity	Magnitude of Change								
	V. Sub	V. Sub / Sub	Sub	Sub / Mod	Mod	Mod / Slight	Slight	Slight / Neg	Neg
High	Major+	Major+	Major	Major / Mod+	Major / Mod	Mod+	Mod	Mod / Min+	Mod / Min
High / Medium	Major+	Major	Major / Mod+	Major / Mod	Mod+	Mod	Mod / Min+	Mod / Min	Minor +
Medium	Major	Major / Mod+	Major / Mod	Mod+	Mod	Mod / Min+	Mod / Min	Minor +	Minor
Medium / Low	Major / Mod+	Major / Mod	Mod+	Mod	Mod / Min+	Mod / Min	Minor +	Minor	Minor / Neg+
Low	Major / Mod	Mod+	Mod	Mod / Min+	Mod / Min	Minor +	Minor	Minor / Neg+	Minor / Neg

6.5.14 This shows 13 different degrees of effect, ranging from Major++ to Minor/Negligible. Major/Moderate or higher effects are predicted to be significant changes in view, as shown highlighted in dark red. Overall effects of Moderate+ may be significant if experienced over a substantial length of a route or over most of a zone, area or location. Overall effects of Moderate may contribute to significance if combined with greater changes at the same location. Moderate/Minor+ or lower effects would not be significant. Whilst being over complicated, the matrix does allow, for example, a clearly noticeable change (moderate/slight magnitude) on a highly sensitive receptor (such as a primary view from a residential property) to be assessed as a significant effect.

6.5.15 Overall, whilst thresholds could have been more clearly defined, the assessment of landscape and visual effects tends to underplay the significance of effects. The LVIA states that the three wind turbines will become a defining characteristic of the landscape within approximately 4km, and effects on receptors between 5km – 6km from the wind farm are considered significant, but this study has found that likely significant effects could extend beyond a distance of 10km.

Heritage Effects

Methodology

6.5.16 Cultural heritage assessment is reported in chapter 9 of the ES, with details provided in a technical appendix. The method of approach was agreed with Northumberland County Council which provided a detailed specification for the assessment. This included direct effects (physical disturbance) and indirect effects (visual effects). The ES includes an assessment of potential indirect effects on the settings of all Grade I and II* listed buildings within 10km, all Grade II listed buildings

within 5km, all conservation areas within 5 km, all registered Historic Park and Gardens within 10km, and all Scheduled Monuments within 10km. The impacts of all elements of the proposed development, from construction through to decommissioning were assessed, taking account of the sensitivity of the cultural heritage asset, the magnitude of change that could arise from the proposed wind farm in isolation and cumulatively with other proposals in the area and therefore the significance of the effects. Effects are categorised as being severe, major, moderate or minor.

6.5.17 The ES Addendum, October 2011, provides an updated assessment in light of Planning Policy Statement (PPS) 5 being published in March 2011 (replacing PPG 15 & 16) and English Heritage’s Consultation Draft Guidance on the Setting of Heritage Assets, 2010.

6.5.18 The cultural heritage assessment is comprehensive, setting out factors relevant to defining the setting of heritage assets (visibility, intent, importance, boundaries, association and authenticity) and potential magnitude of effect upon setting (visual dominance, scale, inter-visibility, vistas and sight lines, movement and sound or light effects, unaltered settings and amenity). Definitions of sensitivity are given (on a 4-point scale of Very high, High, Medium and Low with regard to importance at the international, national, county and local scales respectively), and magnitude of effects (on a 6-point scale from Very substantial adverse, Substantial adverse, Moderate adverse, Slight adverse, Negligible adverse and No change).

6.5.19 Significance of effects are indicated by way of a matrix showing interactions between sensitivity and magnitude, reproduced in **Table 13** below:

Table 13: Significance of Heritage Effects

Sensitivity	Magnitude of Effects				
	Very substantial	Substantial	Moderate	Slight	Negligible
Very high	Severe	Severe /Major	Major	Major / Moderate	Moderate
High	Severe /Major	Major	Major / Moderate	Moderate	Moderate / Minor
Medium	Major	Major / Moderate	Moderate	Moderate / Minor	Minor
Low	Major / Moderate	Moderate	Moderate / Minor	Minor	Minor / Neutral

6.5.20 Effects shaded red are judged in the ES to be significant in the context of the EIA Regulations. Thus limited destruction of or damage to a heritage asset (slight adverse magnitude of effect) of high sensitivity (nationally designated assets such as Scheduled Monuments, listed buildings, registered Historic Parks and Gardens, for example) are not considered as significant.

Analysis of Predicted Heritage Effects

- 6.5.21 The study areas for different heritage assets as described above were agreed with the County Council. On the face of it the distance of 10km for assessing impacts on Scheduled Monuments would appear to rule out Hadrian's Wall which lies approximately 12km from Boundary Lane. However, the assessment considers separately the impact on the Scheduled Monument and World Heritage Site and its setting.
- 6.5.22 All potential effects appear to have been considered in the assessment, with no known omissions. The assessment identifies potential effects on 14 nationally designated heritage assets (high sensitivity). All effects are predicted to be slight or negligible (slight or negligible change to the understanding and appreciation of the asset) with overall moderate or moderate/minor and thus not significant effects. Fieldwork undertaken for this study suggests that this conclusion is generally an accurate reflection of effects on heritage assets located mostly between 2.5km to 5km from the wind farm.
- 6.5.23 The viewpoint assessment could have included other key views, for example from within Gibside Registered Park and Garden (viewpoint 13 is from a footpath east of Gibside) and from a recognised viewpoint along the Derwent Valley Walk on the edge of Ebchester Conservation Area (close to viewpoint 12 in the Kiln Pit Hill Wind Farm ES) that overlooks the Coalfield Upland Fringe including the Boundary Lane Wind Farm and Kiln Pit Hill Wind Farm, as shown in the following photographs:



Figure 13- View from a recognised viewpoint on the Derwent Valley Walk overlooking Ebchester Conservation Area and Boundary Lane Wind Farm.



Figure 14 - View from close to the recognised viewpoint on the Derwent Valley Walk in the above photo. overlooking Ebchester Conservation Area, Boundary Lane and Kiln Pit Hill Wind Farms.

6.6 Green Rigg Wind Farm Landscape, Visual and Heritage Effects of the Environmental Statement

Wind Farm Profile - Green Rigg	
Location	Approximately 8.5km of Bellingham and 2 km east of the A68
Number of turbines	18
Output (MW)	36
Height to hub	60m
Height to blade tip	100m
LPA / Appeal / SoS decision	SoS
Date of Permission	25.03. 10
Full ES? / Date	Yes / December 2005



Figure 15 -Green Rigg Wind Farm (part) from Great Wanney Crag

- 6.6.1 Green Rigg Wind Farm falls within a deeply rural location north-east of Sweethope Lough, and stands across sloping land with the highest turbine at around 310m AOD. It is accessed from minor roads lying between the A68 to the west and the A696 to the east at Knowesgate. Its western-most turbines stand some 700m from

the nearest isolated farmsteads and cottages to the west. It is located within the Outcrop Hills and Escarpment LCT and Sweethope and BlackdownLCA³²

- 6.6.2 The planning application for the wind farm was submitted to Tynedale District Council January 2006. A full Environmental Statement was prepared.

Landscape and Visual Effects: Green Rigg Methodology

- 6.6.3 The Green Rigg ES sets out a full Landscape and Visual Impact Assessment. It notes methodology was developed reflecting up-to-date guidance including GLVIA Second Edition (2002) in relation to predicting and assessing the impacts of renewable energy schemes. The LVIA also references contemporary Landscape Character Assessment guidance. Other assessment guidance documents used include the regional landscape character area descriptions from the Countryside Commission/ Agency³³ and descriptions of local landscape types taken from a 2003 Government Office for the North East project³⁴.
- 6.6.4 The LVIA methodology is comprehensively set out within the ES Technical Appendix 4, noting an 8 stage process including visibility analysis, viewpoint analysis, visual assessment, landscape assessment and cumulative review (having regard to Kirkheaton Wind Farm as the only installed wind farm at the time of the proposals).
- 6.6.5 A limited record of consultee influence within the LVIA scoping process is set out with responses contained within its Technical Appendix 4. Responses from statutory consultees do not raise specific reference to preferred viewpoint siting and do not challenge the 15km study area definition proposed. Countryside Agency and Tynedale District Council responses do raise issues of ensuring viewpoints from within the Northumberland National Park are included within the ES. No record of correspondence with Northumberland National Park Authority is set out.
- 6.6.6 Following scoping, the LVIA defines a 15km study area within which it assumes all important receptors (including landscape character areas) lie, although 2 viewpoints outside this distance are included within the LVIA to have regard to Northumberland National Park. Zone of Theoretical Visibility (ZTV) mapping was prepared to an extended radius of 20km, 5km beyond the full study area for various extent of turbine theoretical visibility.

³² Northumberland Landscape Character Assessment, 2010.

³³ Regional Character Areas are taken from the Countryside Commission/Agency's *Countryside Character Volume 1: North East*, 1998

³⁴ Benson, J.F., et al (2002) *Landscape Appraisal for Onshore Wind Development*, Government Office for the North East

6.6.7 A total of 32 viewpoints were initially assessed for the LVIA but only 14 of these set out within the LVIA/ES where considered to present representative views and receptors. 7

Analysis of Viewpoint Assessments

6.6.8 The detailed findings of the 7 sites selected for viewpoint examination are set out at within the Technical Appendix of this report. In summary the research found that the generic issues identified in relation to visualisations across the whole study sample were applicable to the Green Rigg Wind Farm LVIA case. Further or specific issues identified specifically at Green Rigg include:

- Considerable complication (for comparison in field) arises in relation to the assessment of the Viewpoint between Environmental Statement Volume, 3 (December 2005) and the figures within Cumulative Review of Landscape and Visual and Archaeological Issues, (June 2006) outputs. These describe the same location (VP 1 Great Wanney Crag) but are taken from different positions on the ground, although mapping inset locations are the same. The initial VP analysis uses a less than optimal viewpoint along a well-used footpath, whereas the 2006 document utilises the more obvious, and more prominent site. The analysis within this report uses the latter Viewpoint (Fig 6a(iv)).
- This disparity is significant in relation to observed prominence of turbines which is considerably greater in the second viewpoint location on Great Wanney Crag, than on the 'approach' to it along a PROW.
- Tranquil location with little development evidenced in landscape. Wind Farm significantly alters this balance.
- Notable off-set of turbine position in immediate vistas from closest viewpoints.
- Reference in ES/LVIA to some main vistas being in directions 'away' from the turbines may be partly correct but a defining characteristic of this and some other sites are 360⁰ elevated vistas in an undeveloped landscape.
- Significant difference in planation prominence and cover observed in field from visualisations. Plantations often provide temporary screening due to rapid rotation clearance and replanting.
- Viewpoint selection was considered generally appropriate with no significant omissions noted.

Analysis of Predicted Landscape and Visual Effects

6.6.9 A detailed review of the assessment of visual and landscape effects from the ES was carried out for the Green Rigg sample viewpoints (see Technical Appendix). This found that in the large majority of cases assessment of sensitivity of receptors

and magnitude of change or effect of the development from the viewpoint were broadly supported by this study.

6.6.10 Magnitude of change in the views used a 5 point scale: Very Substantial; Substantial; Moderate; Slight; and Negligible with intermediate combinations of these utilised as considered appropriate. Sensitivity of change was assessed on a 5 point scale: High; High/Medium; Medium; Medium/Low; and Low. The Green Rigg LVIA transparently defines each sensitivity and magnitude of change category, in accordance with GLVIA. For example, the definition of a ‘High/Medium’ sensitivity would be where effect (i.e. not considered ‘significant’ in the LVIA) is:

‘The proposed development would cause a noticeable difference to the landscape or view, and would affect several receptors’.

6.6.11 Significance outcomes on the scale Major ++ to Minor/Negligible are not however further defined. A matrix for significance of change was utilised as set out in **Table 14**.

Table 14: Green Rigg ES Matrix of Significance

MAGNTIUDE OF CHANGE	Very Substantial	Very Sub/ Substantial	Substantial	Substantial/ Moderate	Moderate	Moderate/ Slight	Slight	Slight / Negligible	Negligible
High	Major ++	Major +	Major	Major / Mod+	Major / Mod	Mod+	Mod	Mod / Minor+	Mod / Minor
High/ Medium	Major +	Major	Major / Mod+	Major / Mod	Mod+	Mod	Mod / Minor +	Mod / Minor	Minor+
Medium	Major	Major / Mod+	Major / Mod	Mod+	Mod	Mod / Minor+	Mod / Minor	Minor+	Minor
Medium/ Low	Major / Mod+	Major / Mod	Mod+	Mod	Mod/ Minor+	Mod / Minor	Minor +	Minor	Minor/ Neg+
Low	Major / Mod	Mod+	Mod	Mod/ Minor+	Mod / Minor	Minor+	Minor	Minor/ Neg+	Minor/ Neg
	EFFECT SIGNIFICANCE								

6.6.12 It can be seen that ‘significant’ effects in terms of the EIA Regulations 1999 are applicable to those classified between **Major++** and **Major/Moderate** outcomes (highlighted in red in Table 14). These classifications account for one third of outcomes out of a total of 45 possibilities. The LVIA does however acknowledge that lesser functions of Moderate+ (orange cells) may be significant if experienced over a longer linear route, or even moderate outcomes (yellow cells) where found in combination with other changes to the view. This represents a sophisticated and

potentially responsive and adaptive methodological approach. It can be seen therefore that whilst the weight of significance of classifications are placed at the lower end of the receptor sensitivity scale (i.e. towards the 'Negligible' column) the method affords professional judgments of significance to be applied to combinations of less sensitive receptors or lower magnitudes of change.

Cumulative Landscape and Visual

- 6.6.13 The original submitted ES included an extensive LVIA which it stated was effectively also a cumulative assessment as it took account of Kirkheaton Wind Farm into account, at distance of around 10km separation the then only operational wind farm within the study area. In doing so the LVIA examined where ZVIs overlapped, primarily to the south and south east of Green Rigg. Four wireframes or photomontages were included within the ES which illustrated the prominence and location of Kirkheaton Wind Farm where this was predicted to lie within the same vista as Green Rigg from those 4 viewpoints. Methodology for assessing the significance of the cumulative view is not set out but the report suggests that only vistas from viewpoint 5 at St Aidan's Church, Throcklington at 5.5km, would present a substantial/moderate visual effect and hence significant.
- 6.6.14 The ES suggests that no impacts upon landscape character would arise in relation to cumulative impacts of Green Rigg and Kirkheaton in combination and considers cumulative impacts on linear routes and recreation sites to be not significant. In relation to Green Rigg and Kirkheaton alone, these conclusions are agreed with although the transparency of determination is weak, with considerable reliance on written narrative and professional judgement.
- 6.6.15 Six months after the submission of the planning application and original supporting material (above), a supplementary detailed cumulative impact assessment and additional visualisations was prepared and submitted. This expanded the assessment scope of the cumulative visual and landscape effects arising as a consequence of Green Rigg in combination with Kirkheaton and the 'Ray' wind energy proposals to the immediate north east of Green Rigg. The supplementary assessment set significantly expanded wireframe and photomontage visualisations to help predict potential outcomes and a series of particularly complex ZVIs considering the various permutations of wind farm proposals.
- 6.6.16 At public Inquiry the proposals for Ray Wind Farm were dismissed (although approved subsequently by the Secretary of State) in favour of the Green Rigg scheme. Hence the predicted cumulative effects of Green Rigg with Ray could not be compared to actual effects by this study.

Heritage Effects: Green Rigg

Methodology

- 6.6.17 This study considers visual and setting implications of Green Rigg Wind Farm on the cultural heritage baseline within the context of relevant legislation and planning policy guidelines, setting out a range of potential effects of the proposals.
- 6.6.18 Chapter 11 of the Environmental Statement addresses Cultural Heritage. This is supplemented by schedules of heritage assets set out in Appendix 7 of Volume 4 of the ES. For the purposes of the ES it scopes cultural heritage resources potentially affected by the proposals as being *the settings* of: Scheduled Monuments; Listed Buildings; Conservation Areas; Registered Parks and Gardens; and Registered Battlefields within a study zone of 5km from the site. However, apart from Scheduled Monuments there are no such identified assets within these categories within this radius. The Cultural Heritage impact assessment was therefore extended a further 10km radius from the site to a radius of 15km. The study also specifically scopes in the assessment of impacts upon the defined setting of Hadrian's Wall World Heritage Site at some 8.2km south of the site (although the wall itself is 10.6km from the site). Extension of the study zone as an apparent consequence of no heritage assets falling within its initial area does raise the question of its initial validity, or more likely, question the need to extend it?
- 6.6.19 The Heritage Assessment entailed primarily a desk-based study with limited walk-over assessments made on those sites where potential affects of settings were anticipated. It comprehensively identifies historic and cultural assets within the extended study area, and provides a brief description of each. The cultural heritage assessment of the ES states that it uses methodology based upon best practice at the time of the assessment³⁵. It does not set out summaries of the key legislation and government policy for the various components and different designations of historic environment. A scoping exercise in relation to the extent of the pertinent elements of the historic environment was undertaken in consultation with the LPA and Northumberland County Council Conservation Team.
- 6.6.20 A predicted impact methodology is set out within the ES. It does not utilise a matrix of significance as a function of magnitude of change and sensitivity. It therefore relies extensively of professional judgment. In relation to indirect effects on settings, it sets out a hierarchy of effects as shown at Table 15.

³⁵ Institute of Field Archaeologists Code of Conduct (IFA 2006) and Standard and Guidance for Archaeological Desk-based Assessment (IFA 2001).

Table 15: Hierarchy of effects

Significance of Effect	Definition of effect
Major	Impact on setting of cultural heritage site of international or national importance that would result in character or appearance being compromised to the extent that appreciation and understanding is destroyed or substantially diminished, even after mitigation.
Moderate	Impact on setting of cultural heritage site of international or national importance that would result in character or appearance being compromised to the extent that appreciation and understanding is partially diminished.
Minor	Impact on setting of cultural heritage site of international or national importance that would result in character or appearance being compromised to the extent that appreciation and understanding being slightly compromised.
Negligible	No appreciable impact upon cultural heritage sites or their settings. The integrity, understanding or appreciation would not be affected.

Analysis of Predicted Heritage Effects

- 6.6.21 No overt justification for the delineation of the study area boundary is presented within the ES apart from an assumption that impacts beyond this distance would be unlikely to be significant. The 10km boundary is therefore independent of other study area radii used within the ES, 5km less than those for Landscape Character Assessments and visual assessment and 10km less than its ZTV. In taking a 10km study area, assessment of indirect effects on heritage assets elsewhere has not therefore been undertaken apart from specifically having full regard to the setting of Hadrian’s Wall World Heritage Site (HWWHS). Whilst this study does not suggest that the assessment of heritage impacts from Green Rigg Wind Farm has been materially weakened, given the scale, number and movement of turbines, topographic elevation alongside the exceptionally rich heritage resource of the county, the study may have benefitted from a methodology which allowed for impacts to be assessed on other ‘high’ designation heritage assets beyond this study area on a selected site-by-site basis in a similar way to the treatment of the HWWHS. Notwithstanding this observation, the scope of assessment within the study zone is comprehensive.
- 6.6.22 The assessment of residual effects on the heritage resource of the study area is set out as a site-by-site narrative, assessing in turn effects on Conservation Areas, Listed Buildings, Registered parks and Gardens, Local Historic Landscape Designations, Archaeological remains and Hadrians Wall WHS. Within this assessment there is no summary table or summary graphic setting out assessed significance of effect against each heritage asset.

- 6.6.23 Whilst setting out a predicted effects hierarchy as noted above, the impacts narrative makes inconsistent use of the categories of Major, Moderate, Minor and Negligible. This may be seen to cloud transparency of outcomes and process. For example the system is widely applied to Scheduled Monuments, but reference to impacts upon Conservation Areas relate to whether or not the character and appearance of the Conservation Area has been preserved (consistent with Conservation Area legislation³⁶) rather than using the scale of significance of effects. For Listed Buildings there is inconsistent use of significance judgements and reference again to preservation of setting. Reference to effects upon Tone Hall Farmhouse, a Grade II Listed Building concludes that it “*could be considered that the turbines may potentially affect the setting of this listed Building*”, but no indication of relative significance is set out. This could be viewed as circumventing the need to present a ‘significant’ finding in the heritage report.
- 6.6.24 The assessment concludes that no impacts upon Registered Parks and Gardens were anticipated, but reference to visibility from within these to the development are occasionally inconsistent, and may suggest a loose substitution of the terms visibility and significance of visual effects.
- 6.6.25 The Heritage Assessment goes on to consider indirect impacts upon Scheduled Monuments. Interestingly, the assessment sets out a more comprehensive analysis of the potential indirect effects on the settings of these features than is offered for other heritage designations and utilises the significance attribution of effects set out in its method statement. The assessment concludes that there would be no significant impact upon Scheduled Monuments between 1km and 3km distance from the site and deduces that therefore none would be found at distances greater than that.
- 6.6.26 No indirect effects are identified in relation the Hadrian’s Wall WHS *setting*, primarily as a function of distance and intervening landscape elements and non-interference between the wall itself (and associated archaeological structures/features) and its formally defined setting. This is agreed with in the main although the duration of effect by walkers along the Wall is significant.
- 6.6.27 The heritage assessment concludes that only minor indirect impacts upon the settings of two Listed Buildings:- Carrycoats Hall and Tone Hall Farmhouse, were predicted and that these may be mitigated through planting schemes.
- 6.6.28 In recognising inconsistency in method application, and also recognition that visual impacts have been occasionally described conservatively, this study does not concur with the heritage assessment’s finding that there would be no significant effect of

³⁶ Planning (Listed Buildings and Conservation Areas) Act 1990

the proposal on the heritage assets of the area, and that effect is significant in relation to views *from* Hadrian's Wall, exacerbated by the duration of views experienced by walkers.

6.7 Kirkheaton Wind Farm: Landscape, Visual and Heritage Effects of the Environmental Statement

Wind Farm Profile - Kirkheaton	
Location	Approximately 800m from the village green at Kirkheaton to the east and 5km south-west of the A 696 at Kirkharle.
Number of turbines	3
Output (MW)	1.8MW
Height to hub	45m
Height to blade tip	66m
LPA / Appeal / SoS decision	Appeal
Date of Permission	21.01.1999
Full ES? / November 1997	No – ‘Environmental Report’.



Figure 16 – Kirkheaton Wind Farm from West End.

6.7.1 Kirkheaton Wind Farm falls within a deeply rural location immediately west of the small historic agricultural hamlet of Kirkheaton. It stands across farmland with the highest sited turbine at around 240m AOD. It is accessed from minor roads from Kirkheaton only and stands in an area remote from main highways. Its eastern-most turbines stand some 700m from the nearest habited cottages to the east. It is located within the Mid Northumberland NCA, Lowland Farmed Moor LCT and within the Ingoe Moor LCT³⁷

³⁷ Northumberland Landscape Character Assessment, 2010.

- 6.7.2 The planning application for the wind farm was submitted to Castle Morpeth Borough Council in November 1997. An Environmental Report was prepared pre-dating the requirements of the subsequent 1999 EIA Regulations.

Landscape and Visual Effects

Methodology

- 6.7.3 In comparison to other Environmental Statements examined within this study, the supporting environmental material to the planning application is significantly less comprehensive. Its acknowledgements suggest it was prepared by a professional team primarily with engineering and surveying backgrounds. The statement notes that external professional consultants were appointed in relation to archaeological matters only.
- 6.7.4 A brief record of a scoping process / pre-application discussion with the LPA is noted at Appendix B but not within the main report, although this is very limited. The Environmental Report focuses upon the more general (economic and environmental) case for renewable energy and the benefits of wind power, reflecting the then relatively recent maturity of the technology and sector as a planning matter.
- 6.7.5 The statement does address visual matters but not landscape character impacts. No comprehensive approach reflecting a full LVIA is offered.
- 6.7.6 A rudimentary ZVI is set out at Figure 8. A 10km study area radius is defined and justified as being the area within which significant visual effects will generally be limited, based upon then ETSU Guidance³⁸. The LPA is stated as having agreed to this radius but evidence is not set out. It properly notes that the ZVI presents a worst-case scenario for visual impacts and should not be used for prediction of impacts and effects.
- 6.7.7 Visual assessment primarily consists of only 4 viewpoint analyses that may appear rudimentary by current standards of LVIA. These viewpoints are represented through photomontages from 4 points agreed with Castle Morpeth and neighbouring Tynedale LPAs. All 4 viewpoints fall within 2.5km of the development site, with the closest at only 820m. No formal process of anticipating the significance of visual effect is presented (i.e. function of sensitivity of receptor and magnitude of change). Instead the report relies upon interpretation of the photomontages to assess visual impact alone. No opinion on significance is offered and no summary statement on visual impact is presented.

³⁸ The Visual impact of Wind Farms, Lessons from the UK Experience, ETSU 1994.

Analysis of Viewpoint Assessments

6.7.8 The detailed findings of the viewpoint examination are set out at within the Technical Appendix. In summary the research found that the generic issues identified in relation to visualisations across the whole study sample were applicable to the Kirkheaton case. Further or specific issues identified at Kirkheaton include:

- Despite relatively small size of turbine, they often ‘read’ as large wind turbines in absence of comparative visual references – this may reflect on observers’ experiences of viewing more recent larger turbine sizes in the landscape.
- Difficulty experienced locating viewpoints, with grid references considerably divergent from photo imagery.
- Lack of justification or obvious reasons why particular viewpoints are selected when considerably more important and clear views can be experienced from public locations in near proximity.
- The relative age of the development has afforded considerable tree growth to mature by the time of this study, resulting in considerable degree of screening from 2 of the 4 viewpoints.

6.7.9 In addition to the viewpoint photomontages the report identifies 4 further ‘Lines of Sight’ assessments from small hamlets in the locality between 5km at Maften and 800m at Kirkheaton. This closest location however coincides very closely with viewpoint and photomontage previously set out and somewhat negates any added value. Minimal summary statements are presented which describe the visibility of each of the 3 turbines from each point. No visualisations are presented. All points from Maften and Ingoe lines of sight are recorded as ‘no visibility’. No indication of the significance of visual impacts of those turbines visible or partly visible from Kirkheaton or Wallridge is offered. The value of these additional assessments is limited.

Landscape Effects (including Cumulative)

6.7.10 No reference to landscape character is presented by the report. The site lies within the Lowland Farmed Moor LCT. The Northumberland KLUIS (2010) affords a low sensitivity to the LCT. This study would concur with this assessment of sensitivity and in character terms the modest scale of the wind farm does not have a significant impact upon the integrity of local landscape character. No cumulative effects were considered at the environmental report given that the development at Kirkheaton was the first of its type within inland Northumberland.

Visual Effects (including Cumulative)

- 6.7.11 No methodology for selection of viewpoints or relative sensitivity of receptors is offered by the report. Visual impacts of the development are particularly localised as a function of the number of turbines and relatively low tip height of 66m. However, locally the visual prominence of the wind farm is occasionally significant, particularly from viewpoints to the immediate east (Kirkheaton footpaths) and from the north on public routes around Cocklaw Walls. Here the turbines do not necessarily read as smaller installations, and their location on a low but pronounced local ridge affords high prominence. From Cocklaw Walls and Little Bavington, receptor sensitivity may be seen to be high from a small number of isolated residential properties with views to the south over a distance of between 1.5km and 2.5km.
- 6.7.12 Conversely, views to the turbines from the small settlement of Hallington at around 2.5km to the west have been significantly screened as a consequence of over 15 years of tree growth. Similar screening effects have arisen with the maturing of shelterbelts and other landscape vegetation in views from Tongues Farm, a selected viewpoint to the east. The effectiveness of screening, by design or otherwise presents a useful case study in understanding the medium term benefits of structural planting.

Heritage Effects

Methodology

- 6.7.13 This study considers visual and setting implications of Kirkheaton Wind Farm on the cultural heritage baseline within the context of relevant legislation and planning policy guidelines, setting out a range of potential effects of the proposals.
- 6.7.14 In comparison to other elements of the environmental report, the coverage of archaeological impacts of the proposals is expansive. It is notable that authorship of the report includes input from a specialist heritage consultant. Section 6.3 of the report sets out the summary findings of a more detailed report presented in full at Appendix D. However this comprehensive but mostly descriptive appendix offers very little assessment of indirect visual effects on the setting of heritage assets outside the immediate archaeological interests located in and around the application site itself.

Analysis of Predicted Heritage Effects

- 6.7.15 Section 6 of the environmental report distils pertinent information from the archaeological assessment in relation to potential for on-site, direct impacts of the turbines, access track and cotemporary construction compound. It offers virtually no assessment of the predicted impact of the proposals on the setting of heritage assets off-site. Given the report identifies several listed buildings within Kirkheaton

village itself as well as recognising the relative integrity of the medieval settlement pattern around the distinctive village green close to the eastern edge of the development site, this can be seen to be a significant shortcoming.

- 6.7.16 Notwithstanding the methodological and scope shortfalls of the heritage assessment, the location and scale of the development west of the village, partly screened by established shelterbelts and falling topography suggests that the setting of the village's historic character and component listed buildings is not significantly diminished by the installed development and its conclusion of no indirect impact is supported.

6.8 Cramlington MSD Wind Turbines Landscape, Visual and Heritage Effects of the Environmental Statement

Wind Farm Profile – Cramlington MSD	
Location	On the northern edge of Cramlington New Town, within the curtilage of Merck Sharp and Dohme industrial complex, Shotton Lane.
Number of turbines	2
Output (MW)	5 MW
Height to hub	80m
Height to blade tip	130m maximum
LPA / Appeal / SoS decision	Appeal
Date of Permission	24.07.08
Full ES? / Date	Yes / December 2006



Figure 17 -Cramlington MSD Wind Turbines from Nelson Pit top

- 6.8.1 Cramlington MSD Wind Farm falls within an urban fringe location immediately north of Cramlington New Town in an industrial / employment zone, but adjacent to open farmland to the north and west. The twin turbines stand within a factory compound sited at around 65m AOD. It is accessed from main highways servicing the factory. Its turbines stand some 780m from the nearest habited cottages to the west. It is

located within the South East Northumberland Coastal Plain NCA, Coalfield Farmland LCT, and Stanington LCA³⁹

- 6.8.2 The planning application for the wind farm was submitted to Blyth Valley Borough Council in December 2006. An Environmental Statement was prepared. However, the Screening Opinion sought from the LPA determined that by virtue of the discretion afforded to it under Schedule 3 of the 1999 EIA Regulations, a full Environmental Statement was *not* required. However the opinion stated that a visual impact assessment was pertinent to determination of the proposals. Notwithstanding this opinion a full ES was submitted including a Visual Impact Assessment (but not an LVIA reflecting the expectations of LI/IEMA's *GLVIA*).

Landscape and Visual Effects

Methodology

- 6.8.3 No record of a comprehensive scoping process is set out or lists the engagement and influence of statutory consultees. However it notes that the selection of viewpoints for assessment of visual effects was chosen in consultation with the LPA. An extract from the regional landscape character area descriptions from the Countryside Commission/ Agency⁴⁰ for the South East Northumberland Coastal Plain is presented as an appendix but no interpretation of effects is offered in this regard.
- 6.8.4 Visual Assessment defines a 10km study area. Zone of Theoretical Visibility (ZTV) graphics were prepared to this study area radius for various extent of turbine theoretical visibility. Fifteen viewpoints were selected for presentation of detailed visualisations illustrating anticipated visual effects. In addition, the proposed wind farm at Aesica, an immediately adjoining industrial compound were considered in order to assist in cumulative assessment. Existing wind farms beyond the 10km study area were not included in this assessment. A number of viewpoints were selected where cumulative impacts would potentially arise. Only photomontage visualisations were prepared for all viewpoint analysis.
- 6.8.5 Appendix 1 sets out the selected viewpoint assessments examined by this study from the 15 presented within the ES.

Analysis of Viewpoint Assessments

- 6.8.6 The detailed findings of the viewpoint examination are set out within the Technical Appendix. In summary this report finds that most of the generic issues identified in relation to visualisations across the whole study sample were applicable to the

³⁹ Northumberland Landscape Character Assessment, 2010.

⁴⁰ Regional Character Areas are taken from the Countryside Commission/Agency's *Countryside Character Volume 1: North East*, 1998

Cramlington case. However, further or specific issues identified at Cramlington include:

- Turbines *could* be argued to provide elegant introduction to an otherwise modern industrial urban context with limited topographic landscape features or foci.
- Major earthworks (Shotton surface mine/*Northumberlandia*) set a *significant* landscape context change to when photomontage created.
- The urban location of the wind farm presents views across a significant urban residential area.
- Impacts at the most distant viewpoint (Seaton Sluice at 10km) combined with photomontage visualisation is very difficult to compare across a flat and mostly urban landscape context.
- Significant doubt is raised over some viewpoint selection value, particularly for VP 13 within the AGLV which appears to have been selected for designation purpose only as there is no public access to the viewpoint or comparable locations.

Analysis of Predicted Landscape and Visual Effects

6.8.7 A detailed review of the assessment of visual effects from the ES was carried out for the Cramlington sample viewpoints (see Technical Appendix) (*landscape* issues were not expressed). The Visual assessment presented brief descriptions of the extent of visual prominence of the turbines from each viewpoint. No attempt at systematically defining the significance of visual effects as a function of receptor sensitivity and magnitude of change was offered. A brief narrative asserting assumed professional opinion was instead presented for each viewpoint with no consistent categorisation of the degree of visual impacts expressed. No indication of effects on the landscape character of the development at viewpoints or elsewhere is offered, although the character area description is set out as an appendix.

Landscape Effects (including Cumulative)

6.8.8 Limited reference to landscape character is presented by the report. The site lies within the South East Northumberland Coastal Plain NCA and within the Coalfield Farmland LCT and Stannington LCA. The Northumberland KLUI (2010) affords a low sensitivity to the LCT. This study would concur with this assessment of sensitivity and in character terms the modest scale of the wind farm does not have a significant impact upon the integrity of local landscape character which is locally dominated by modern urban development and industrial and transport infrastructure.

6.8.9 No cumulative effects were considered in respect to Landscape Character.

Visual Effects (including Cumulative)

- 6.8.10 No methodology for selection of viewpoints or relative sensitivity of receptors is offered by the report, although these generally present representative vistas over a predominantly urban fringe context with limited topographical variation. The exception to this is the significant post-application earthworks to the west of the site, and the elevated landscape pit heap at the former Nelson Pit that is a selected viewpoint.
- 6.8.11 From most viewpoints as and from those wider areas the turbines tend to be viewed against the flat low horizons and therefore mostly skyline. In doing so prominence and visual impact is highly affected by prevailing light, but on the whole reduces prominence.
- 6.8.12 Cumulative visual effects are noticeable in relation to Berwick Drift, Lynemouth and Blyth Harbour wind farms. However significant cumulative visual impacts are limited to those few higher elevation vistas, such as Nelson Pit and in the context of prevailing landscape character and indistinct visual foci, do not present a significant harmful impact.

Heritage Effects

Methodology

- 6.8.13 This study considers visual and setting implications of Cramlington MSD Wind Farm on the cultural heritage baseline within the context of relevant legislation and planning policy guidelines, setting out a range of potential effects of the proposals.
- 6.8.14 A 'Cultural Heritage and Archaeology' chapter is included within the environmental statement. This is, however, particularly brief. It explicitly notes that neither the screening opinion nor pre-application scoping exercise (which is generally not documented) did not require examination of cultural heritage impacts.
- 6.8.15 The brief report section states that a desk-based study was undertaken and photomontages for viewpoints 14 and 15 selected because of potential indirect effects on (assumed) listed buildings Blagdon and Arcot Halls respectively. No systematic method for assessment of receptor sensitivity or magnitude of change is presented and the limited predictions of heritage effects are limited to undefined professional judgement. In this respect there is no indication within the environmental statement whether heritage professionals undertook this element of the study.

Analysis of Predicted Heritage Effects

- 6.8.16 The report notes briefly that there will be no possibility of direct impacts on heritage assets (archaeological) within the application site. This report does not dispute this assertion.
- 6.8.17 The assessment of visual impacts does acknowledge the visual proximity of the Cramlington Windmill ruin at Shotton Lane, approximately 250m from the nearest turbine site. This is reflected in the Viewpoint 10 visualisation. For three other heritage sites (historic buildings for which designation/listing is not made clear in the assessment) no significant visual impacts are anticipated. This study supports those assessments in relation to the viewpoints identified and subject to field survey review surveyed as part of this study. Furthermore, the predominant urban and urban fringe character of the site and its immediate surrounding context of industrial sites, transport infrastructure and minerals workings significantly affect the historic setting of those identified historic buildings to which the turbines present only limited further dilution of setting.

6.9 Lynemouth Wind Farm: Assessment of Landscape & Visual Effects and Heritage Effects in the Environmental Statement

Wind Farm Profile - Lynemouth	
Location	On land between Lynemouth and Ashington, to the west of the Alcan aluminium works.
Number of turbines	13
Output (MW)	Approximately 30MW
Height to hub	80m
Height to blade tip	121m
LPA / Appeal / SoS decision	Appeal
Date of Permission	January 2009
Date Operational	2012
Full ES / Date	Yes / February 2006 & Addendum November 2006



Figure 18 –Lynemouth Wind Farm from the cemetery

6.9.1 Lynemouth Wind Farm is located on land between the village of Lynemouth and Ashington, west of the Alcan aluminium plant and immediately north of the Queen Elizabeth II Country Park. It lies at around 30m AOD on the coastal plain, in the Coalfield Farmland Landscape Character Type and within the Coastal Coalfields

Landscape Character Area⁴¹. The Ashington urban fringe lies immediately to the south, whilst in contrast the broad Druridge Bay lies to the north stretching from Amble down to Cresswell, with Lynemouth Bay to the east between Cresswell and Newbiggin-by-the-Sea.

- 6.9.2 A planning application for a wind farm comprising 16 turbines was submitted to both Wansbeck District Council and Castle Morpeth Borough Council in February 2006 as the proposed site of the wind farm straddled the boundary between these two former council areas. A full Environmental Statement was prepared. Following consultations, a revised application was submitted for a reduced wind farm with 13 turbines accompanied by an ES Addendum in November 2006. The landscape and visual impact assessment (LVIA) chapter of the ES was revised, including an assessment of cumulative effects of wind farm proposals since submission of the original application and with the inclusion of a new viewpoint located within the Northumberland Coast AONB at the request of the Countryside Agency.

Landscape and Visual Effects

Methodology

- 6.9.3 The LVIA is contained within one chapter of the ES. It is not contained within a separate detailed LVIA technical appendix as is the case with some of the other ESs reviewed. The method of assessment is specifically devised by the landscape consultants (EDAW) for the LVIA of wind farms, based on GLVIA Second Edition⁴².
- 6.9.4 Following scoping, a 35km Zone of Visual Influence (ZVI) was agreed with both councils to define the study area. This accords with the recommended distance of ZVI/ZTV in SNH guidance at that time⁴³ for turbines 101 – 130 meters high to blade tip.
- 6.9.5 A ZVI graphic was prepared to the full study area radius to illustrate turbine theoretical visibility, with viewpoints, route corridors and landscape character areas superimposed. Similarly, cumulative ZVIs were prepared to illustrate combined visibility of Lynemouth with a number of other existing, consented and proposed wind farms. 22 viewpoints were selected for presentation of detailed visualisations using wireframes and photographs of existing views, with photomontages prepared at 12 viewpoints to show predicted landscape and visual effects. Enlarged photomontages to A1 size were included (folded into the ES) for 12 of the viewpoints. In all cases the enlarged view offered a much more realistic impression

⁴¹ Northumberland Landscape Character Assessment, 2010

⁴² The Landscape Institute and Institute of Environmental Management and Assessment, *Guidelines for Landscape and Visual Impact Assessment*, Second Edition 2002

⁴³ SNH/University of Newcastle (2002) *Visual Assessment of Wind Farms. Best Practice*

of the actual view than the 'normal' photomontage prepared in accordance with best practice guidance.

- 6.9.6 The LVIA stresses that graphic material is for illustrative purposes only and are not considered to be completely representative of what will be apparent to the human eye. It notes that the assessment was carried out on site rather than from photographs.

Analysis of Viewpoint Assessments

- 6.9.7 The detailed findings of the viewpoint examination of a selection of 11 out of the 22 viewpoints in the ES are set out within the Technical Appendix. In summary the research found that the generic issues identified in relation to visualisations across the whole study sample were applicable to the Lynemouth case. Further or specific issues identified at Lynemouth include:

- Generally a reasonably accurate correlation between the grid references in the ES and those recorded on site;
- Turbine layout illustrated in the wireframes and photomontages was found to be relatively accurate, but consistently underestimate the scale of all features in the view. The enlarged photomontages at A1 size were found to be much more representative of the actual view;
- Viewpoint selection was considered generally appropriate with no significant omissions noted;
- Selection of view point 18 on the A1 near Morpeth presented significant health a safety issues whilst poorly representing travellers views;
- The assessment of landscape and visual sensitivity, magnitude of change and overall significance of effects was found to be accurate with the exception of one viewpoint at North Seaton where the ES emphasises the assessment of no significant effects even though the viewpoint lies only 3.2km from the nearest turbine – however using the methodology within the LVIA the effects at this viewpoint should have been assessed as significant.

Analysis of Predicted Landscape and Visual Effects

- 6.9.8 A detailed review of the assessment of landscape and visual effects within the ES was carried out for the Lynemouth sample viewpoints (see **Appendix A1**). This found that in almost all cases assessment of sensitivity of receptors and magnitude of change and likely significance of effects of the development from each viewpoint are broadly agreed with (apart from that mentioned above).
- 6.9.9 The LVIA considers physical effects on landscape elements, effects on landscape character, effects on views and cumulative effects. An assessment of route corridors (main roads, the East Coast Main Line Railway, and national cycle route) is included

within the assessment of effects on character whereas effects on this type of receptor are usually included in an assessment of effects on views.

6.9.10 Landscape sensitivity considers landscape value, quality, existing character and the potential for mitigation, and is assessed on a 5-point scale of Low, Medium-Low, Medium, Medium-High and High. Magnitude of landscape effects are assessed on a 4-point scale of Negligible, Low, Medium and High, although split categories are also recorded in the assessment e.g. Medium-High. This questions why split categories weren't included in the assessment of magnitude as they were in judging sensitivity, which would have made the assessment more transparent.

6.9.11 Sensitivity of views is defined by importance (is it a recognised viewpoint?), value (scenic quality) and the nature of the viewer (residents, travellers, etc.). Apparently the methodology used by the consultants to assess magnitude of change on views normally uses a 4-point scale as in the assessment of magnitude of landscape effects noted above. However, the LVIA notes that subtle variations that result from the varying conditions found at each viewpoint result in a number of different levels of magnitude of change that are sufficiently distinctive to merit specific definitions and two additional levels – medium-high and medium-low. The 6 levels of magnitude of change on views are:

- High; where the wind farm is immediately apparent and provides the prevailing influence;
- Medium-High; where the wind farm is an immediately apparent feature but the baseline characteristics are still apparent and influential;
- Medium; where the wind farm forms a readily apparent feature;
- Medium-Low; where the wind farm forms a visible, recognisable feature;
- Low; where the wind farm forms a minor component;
- Negligible; where the wind farm is barely discernible in the view.

6.9.12 Comparing this approach with LVIA in other ESs reviewed for this study, it would seem relevant that a more site specific approach that responds to varying site characteristics should result in an assessment of the significance of effects that is broadly agreed with.

6.9.13 Significance of landscape and visual effects are recorded as either significant or not significant. The LVIA does not include significance matrices but relies on descriptions within the ES text and summary tables. Landscape effects within 3-4km of the wind farm and visual effects within 4-5km are generally regarded as significant in the ES, determined largely where the magnitude of change is considered to be High or Medium-High (rather than being determined by a combination of magnitude and sensitivity of receptors). As noted above, the assessment in the ES at one viewpoint

located 3.2km from the nearest turbine suggested a medium-high magnitude of effect on a receptor of medium sensitivity would be a 'not significant' effect overall, but comparing this assessment with significance matrices used in other ESs would suggest that the effect would be significant.

Cumulative Landscape and Visual Effects

- 6.9.14 The cumulative assessment considers only the addition of Lynemouth Wind Farm to the cumulative situation of other existing and proposed wind farms, and not the overall cumulative situation. A different approach would have been to consider effects of the main Lynemouth development together with an assessment of how or whether it adds to or combines with other developments to create an overall cumulative effect. Arguably the focus should be on the likely significant cumulative effects which may include the overall cumulative situation and not just the addition of the Lynemouth Wind Farm.
- 6.9.15 Another approach is to include in the assessment of cumulative effects the impact of Lynemouth Wind Farm combined with other non-wind farm developments such as the Alcan aluminium plant and the Power Station.
- 6.9.16 The cumulative assessment in the LVIA considers the effects resulting from the addition of Lynemouth to seven other wind farms that lie within a 50km radius of the wind farm site. The assessment concludes that where cumulative effects arise they will have a limited magnitude of change and will not be significant. This is largely because in most views the other wind farms are rarely seen in conjunction with Lynemouth. There is one exception; a viewpoint at Blyth Harbour located 8.7km from the nearest turbine at Lynemouth where two existing wind farms, Blyth Offshore (2 turbines, 91m to tip) and Blyth Harbour (9 turbines, 42.5m to tip) combine to define the characteristics of the view. The addition of Lynemouth increases the cumulative effect but is not considered to cause its significance and is therefore assessed as being not significant.

Heritage Effects

Methodology

- 6.9.17 Cultural heritage assessment is reported in chapter 10 of the ES. A detailed cultural heritage report is included as a technical appendix. The method of approach was agreed with Northumberland County Council Conservation Team, comprising a desk-based assessment of all known cultural heritage sites and field survey within four concentric areas around the wind farm site:
- Within the site area boundary; consideration of all known sites;
 - Within 2km; statutory designations including Scheduled Monuments, all listed buildings, listed parks and gardens, together with the setting of other specific sensitive sites;

- Up to 10km; as above but only Grade I listed buildings considered;
- 10-30km; sites of exceptional sensitivity including World heritage Sites, Scheduled Monuments and listed parks and gardens, together with sites which attract a large number of visitors and are well known.

6.9.18 Criteria were established for assessing direct impacts on cultural heritage features. Sensitivity of receptors is assessed on a 4-point scale of High, Medium, Low and Negligible according to the degree of importance (national/regional/local) and designation. Magnitude of direct impact is also assessed on a 4-point scale of Major, Moderate, Minor and Negligible according to the amount of loss or alteration of the site.

6.9.19 Criteria are also established for assessing impacts on the setting of sites of cultural heritage interest. Sensitivity is established by considering a feature’s visibility and the numbers of people likely to visit a site, within a 4-point grading of High, medium, Low and Negligible sensitivity. It is interesting to compare this approach (in 2006) with the current thinking by English Heritage in its 2014 Consultation Draft document⁴⁴ in which considers that setting is not dependent upon public access, and hence its significance not proportionate to the numbers of people experiencing that setting. Indeed, tranquillity or remoteness, or challenging access can be a defining characteristic of a significant positive effect on setting.

6.9.20 Criteria for assessing the magnitude of impact on a site’s setting range from Major, Moderate, Minor to Negligible depending on the amount of change to the characteristics of landscape elements relevant to a features setting.

6.9.21 A significance matrix is provided that combines magnitude of the impact and the sensitivity of the site. Predicted impacts of Major and Moderate significance are considered to equate to potentially significant effects in the EIA Regulations. **Table 16** below reproduces the significance matrix in the cultural heritage assessment:

Table 16: Criteria for assessing the significance of impacts on cultural heritage features

Magnitude of Impact				
Major	NEGLIGIBLE	MODERATE	MAJOR	MAJOR
Moderate	NEGLIGIBLE	MINOR	MODERATE	MAJOR
Minor	NEGLIGIBLE	NEGLIGIBLE	MINOR	MODERATE
Negligible	NEGLIGIBLE	NEGLIGIBLE	NEGLIGIBLE	MINOR
	Negligible	Low	Medium	High
	Feature Sensitivity			

⁴⁴ English Heritage (July 2014) Consultation Draft Good Advice In Planning Note: *The Setting of Heritage Assets*

Analysis of Predicted Heritage Effects

- 6.9.22 Following the change in the layout of the proposed wind farm with the removal of 3 turbines, a number of original assessments were reviewed and some were revised and included in the ES Addendum. Following the review it was decided that the original cultural heritage assessment as reported in the original ES dated February 2006 did not need revising.
- 6.9.23 Adoption of a methodology that considers effects within four concentric areas around the wind farm site would appear to be appropriate to enable an assessment of all likely significant effects. The heritage assessment of the ES concludes that very limited harm would arise as a consequence of the proposals. In the main this study supports that finding.
- 6.9.24 It is considered that the approach adopted for judging significance of impacts as shown in the matrix in Table 26 (above) is appropriate in that it records a significant effect where there is a minor impact on a highly sensitive feature, a moderate impact on a cultural heritage feature of medium sensitivity, and a major impact on a feature of low sensitivity.
- 6.9.25 No direct effects on any heritage features are predicted. All impacts upon the settings of heritage features are assessed as either negligible or minor, and not significant. This includes heritage assets within 10km of the site where views could be a core component in their setting, including Cockle Park Tower (Grade I listed building approximately 6.4km to the west), Cresswell Tower House (Scheduled Monument approximately 3km to the northeast), Newminster Abbey in Morpeth (Scheduled Monument approximately 9km to the southwest), Morpeth Castle ((Scheduled Monument approximately 8km to the southwest), and Bothal Castle (Grade I listed building approximately 4km to the southwest). The assessment of no significant effects on the settings of these heritage features is supported in this study.

7. Implications for the Preparation of the Emerging Northumberland Local Plan Core Strategy

- 7.1 In parallel with the preparation of this report, Northumberland County Council is in the process of preparing its Core Strategy as its principal spatial plan. The preparation of the plan and a fundamental requirement for it to be based on a sound evidence-base was one of the key drivers for this study. The brief for this study includes a requirement for outputs to inform emerging Local Plan policy in relation to the findings distilled from the research.
- 7.2 The emerging plan had evolved through a number of preliminary consultation stages at the time of preparing this report. The Core Strategy Preferred Options (Stage One) consultation document, which was consulted on during February and March 2013, set out draft planning policies in respect to renewable and low carbon energy. These policies have subsequently been refined and consulted upon through Core Strategy Full Draft Plan (consulted upon between December 2014 and February 2015).
- 7.3 Policy 36 of the Preferred Options Plan set out a supportive approach to renewable energy proposals *generally* where these can be accommodated within the environmental capacity of the county or where the benefits of the proposals are outweighed by significant harm to those assets. The Preferred Options Plan then went on to include a specific policy (37) for large-scale wind energy proposals. Policy 37 is set out at **Figure 19**.
- 7.4 This study sets out the recommendations as to how the specific policy for wind energy could be improved from the preferred options policies to help achieve the plan's strategic objectives, that is, delivery of renewable energy generating capacity *within* the special landscape and heritage capacity of the county. The study also provides evidence to underpin the recommended policy criteria relating to landscape and heritage.

Figure 19: Policy Extract from Core Strategy Preferred Options (Stage 1) (2013)

'Policy 37

Large-scale wind energy development

The large scale development of wind turbines, or groups of turbines will be supported, unless the environmental and economic benefits of the proposal are clearly outweighed by significant adverse impacts upon:

- a. Amenity of occupiers of residential properties or residential areas, due to the noise of rotating turbines, shadow flicker or visual intrusion;*
- b. Long range views of and from the Cheviot, Simonside Hills, and the Outcrop Hills and Escarpments of the Northumberland Sandstone Hills National Landscape Character Area which are important to the character and quality of the landscape;*
- c. Peat habitats, and mobile species such as bats or birds;*
- d. The safety of aviation operations, and navigational systems;*
- e. TV and/or radio reception, and information and telecommunications systems; and*
- f. Highways and traffic flow during construction and decommissioning. Applications will need to demonstrate that site access can be achieved without significant adverse environmental, social or economic impacts.*

Within the North Pennines and Northumberland Coast AONBs there will be a presumption against wind energy developments of more than one turbine, or turbines with a hub height of 25 meters or more.

Additional requirements

- i. All planning applications for wind turbine development should be accompanied by rigorous and accurate assessments of all aspects of the proposed development consistent with national guidance, and undertaken in accordance with the latest technical standards and guidance.*
- ii. All planning applications need to assess the cumulative impact of developments, including those with planning consent which have not yet been constructed.*
- iii. To maintain public safety, wind turbines should not be located within topple distance plus 10% of a highway or railway line, and blades should not over-sweep a public right of way.*
- iv. To protect visual amenity, there will be a presumption against development within a distance of six times the turbine blade tip height of residential properties unless it can be demonstrated that the presence of turbines would not have an unacceptable impact upon living conditions.*
- v. All planning applications need to assess the impacts of development in neighbouring administrative areas.*
- vi. All applications will need to demonstrate compliance with each requirement individually and cumulatively.*

Policy 37 should be read in conjunction with Policy 36 for large scale wind energy applications.'

Suggested Policy Refinements

- 7.5 This study presents a series of recommendations for the policy for on-shore wind energy development in the emerging Northumberland Local Plan Core Strategy in relation to visual, character and heritage considerations. Elements of the policy in relation to ecological, private amenity, aviation, television, radio and telecommunication signals and highways matters do not fall within the scope of this study.
- 7.6 The initial emerging findings of the study indicated that changes could be made to the Preferred Options policy that could help to avoid or limit the difficulties encountered in the assessment and implementation of the initial wind farms studied and/or improve the council's ability to properly understand and assess potential environmental consequences of proposed developments. In doing so better decision-making could be fostered, ultimately serving to improve the ability to deliver renewable energy supply *within* the capacity of the county's special environmental and heritage context. More detailed discussion of the recommended refinements to Preferred Options policies is set out at **Appendix A2**.
- 7.7 In *summary*, policy refinement recommendations in respect to the draft policies in the Preferred Options policies are:
- Ensure the scope of policy includes individual wind turbines as well as 'wind farms' with multiple wind turbines;
 - Introduce additional policy criterion in relation to long and medium distance views and 'lines of sight' between iconic landscape and heritage sites;
 - Improve recognition of the need to protect views into and out of nationally designated landscapes;
 - Improve recognition of the need to protect recognised outlooks and views from heritage assets;
 - Introduce a criterion protecting the county's AONBs from cumulative impacts of *individual* wind turbines which create a visual cluster or concentration in views; and
 - Make refinements to the supporting text to aid clarity and intent of policy.
- 7.8 Emerging findings of this study have informed revisions to the policies for renewable and low carbon energy in the Core Strategy Full Draft Plan consultation document. More specifically Policy 60 – '*On Shore Wind Energy*' sets out a broader scope of policy considerations in assessing and determining proposals for wind energy development. **Figure 20** sets out where the emerging findings recommendations have been partly or fully adapted into revised preferred policy wording.

Figure 20 : Extract from Public Consultation Core Strategy Full Draft Plan

Policy 60 – On Shore Wind Energy...

'In plan-making and assessing development proposals, the development of single wind turbines or groupings of turbines will be supported where the applicant can demonstrate that the social, environmental and economic benefits of the proposal clearly outweigh any significant adverse impacts, both individually and cumulatively, upon the criteria set out in Policy 59 and the additional requirements set out in this policy.

Through the development management process, applicants will need to provide evidence to satisfactorily demonstrate that:

- a.*
- b.*
- c....*

- g. The proposal will not result in unacceptable harm to the character of the landscape and the landscape has capacity to accommodate the proposed development;*
- h. There will be no significant adverse effects on long and medium range views to and from sensitive landscapes, such as the Cheviot Hills, Northumberland Sandstone Hills, Northumberland Coast AONB, North Pennines AONB and the Hadrian's Wall World Heritage Site, and lines of sight between iconic landscape and heritage sites and features, particularly where one or more feature is within the Northumberland Coast AONB, the North Pennines AONB or the adjoining Northumberland National Park;*
- i. There are no significant adverse effects on sensitive or well used viewpoints; and*
- j. There are no significant adverse effects on important recognised outlooks and views from heritage assets where these are predominantly unaffected by harmful visual intrusion.*

Within the Northumberland Coast AONB and the North Pennines AONB there will be a presumption against proposals involving more than one turbine or proposals involving turbines with a height, measured to the blade tip, of over 25 meters.

All proposals need to consider cumulative impact. When identifying cumulative landscape impacts, considerations include: direct and indirect effects as well as temporary and permanent impacts. When assessing the significance of impacts a number of criteria should be considered, including: the sensitivity of the landscape and visual resource and the magnitude or size of the predicted change.'

- 7.9 This report broadly supports those changes to the wind energy policy framework made following the emerging study findings. Public and stakeholder consultation responses and engagement will however continue to influence the evolution of this policy and supporting Renewable Energy Policy 59, either through further iterative refinement by the council or through the Examination process. This study reiterates that in order to achieve conservation objectives for the landscape and heritage

assets of Northumberland over the plan period, it will be necessary to robustly defend these changes to policy from challenges through either consultation responses and/or Examination representations.

A Wind Energy Supplementary Planning Document (SPD)

- 7.10 Paragraph 11.82 of the Public Consultation Core Strategy Full Draft Plan (December 2014) states that *‘to add more detail to the policy for on shore wind energy a supplementary planning guidance document will be prepared. It is intended that this document will include more guidance on the requirements of the policies including issues relating to landscape sensitivities, important viewpoints and cumulative impact’*. This study supports the value of such a publication and recognises that the issues relating to wind energy developments is complex and sometimes contentious.
- 7.11 National *Planning Practice Guidance* (NPPG) considers how local planning authorities can identify suitable areas for renewable and low carbon energy generation. The SPD should address this in terms of wind energy development.
- 7.12 SPD should reflect the positive approach to renewable and low carbon energy generation development enshrined in the National Planning Policy Framework (NPPF) (paragraph 98) and the important role that planning can play in the delivery of new renewable and low energy infrastructure in locations where the local environmental impact is acceptable.
- 7.13 NPPG suggests that landscape character assessments could form the basis for considering which technologies at what scale may be appropriate in different types of location. Part C of the NKLUIS addresses landscape sensitivity to key land uses, including onshore wind farms. It assesses the sensitivity of all landscape character areas identified in the Northumberland LCA to small scale wind farms (up to 5 turbines) and large scale wind farms (more than 5 turbines). It does not consider turbine height and does not attempt to evaluate the capacity of each character area to accommodate wind energy development. Since turbine height is a key consideration likely to impact on the character of the landscape and views, the SPD should serve to update the NKLUIS by considering the sensitivity of each character area and its capacity to accommodate different scales of wind energy development in terms of numbers of turbines, groupings and heights. This reflects NPPG’s recognition that technologies have developed since some capacity studies were undertaken (primarily through increased turbine size).
- 7.14 The SDP should take into consideration cumulative effects by considering all operating wind farms together with those consented and others in the planning system, and set out principles for anticipating in what circumstances landscape

capacity has been breach through the in combination effects of separate wind energy developments.

- 7.15 The SPD should expand upon requirements of the local validation list (see chapter 8) by providing guidance to applicants/developers on what information to include in terms of assessing the impact of landscape and visual effects of proposed wind energy development.
- 7.16 The SPD should address the scope of Landscape and Visual Impact Assessment (LVIA) of wind energy development. Guidance should be given on the level of assessment that the County Council would expect to see submitted with an application, with particular reference to guidance in GLVIA Third Edition⁴⁵ and the latest raft of SNH guidance⁴⁶ now widely considered as best practice throughout the UK.
- 7.17 LVIA focuses on what is likely to be important in terms of the effects of change resulting from a development on both the landscape as an environmental resource and on people's views. It should be proportional to the nature and scale of the development proposed and the magnitude of landscape and visual effects likely to occur. While much of the guidance within GLVIA is concerned with the formal process of LVIA as part of the requirements of the Environmental Impact Assessment Directive (2011/92/EU) and Regulations, the same principles and processes should also be followed in more informal landscape and visual 'appraisals' of smaller scale wind energy proposals.
- 7.18 An assessment of landscape impacts should include consideration of direct and indirect effects, temporary and permanent effects, and cumulative effects. An assessment of visual impacts should consider the area in which the proposal may be visible, identifying key viewpoints, the people who will experience the views and the nature of the view. In making a judgement on the significance of effects relevant criteria should be developed for determining landscape and visual sensitivity and the magnitude of the predicted effect, within the Northumberland context.

⁴⁵ Landscape Institute and the Institute of Environmental Management and Assessment, *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition, 2013

⁴⁶ Scottish Natural Heritage, *Visual Representation of Wind Farms Good Practice Guidance*, Version 2, 2014;
Siting and Designing Wind Farms in the Landscape, Version 2, 2014;
Siting and Design of Small Scale Wind Turbines of between 15 and 50m in Height, 2012;
Assessing the Cumulative Impact of On Shore Wind Energy Developments, 2012;
Assessing the impact of small scale wind energy proposals on the natural heritage, Version 2, 2014

- 7.19 Given the potential for cross-boundary effects of wind energy developments, added value may be derived from the SPD through cross-authority endorsement, serving also to further the *duty to cooperate* established under the Localism Act 2011.

Criteria for Assessing Wind Energy Proposals

- 7.20 The SPD should provide clear guidance on the factors that will be taken into account when considering applications for wind energy development under the provisions of the adopted Local Plan – Core Strategy policy framework for renewable energy and wind energy specifically. Positive guidance based on clear criteria will be the most useful.
- 7.21 Reference should be made to the National Policy Statements published by the department of Energy and Climate Change.
- 7.22 In considering planning applications and shaping appropriate local criteria for inclusion in the SPD, consideration should be given to:
- Landscape character, in particular local topography and the scale of the landscape;
 - The special qualities of the National Parks and AONBs within Northumberland and how proposals should have regard to these;
 - Conservation of heritage assets of significance, including impact on views to and from iconic features (coastal and elsewhere) and on their settings;
 - Other sensitive and well-used viewpoints;
 - Protecting local amenity; and
 - Cumulative landscape impacts and cumulative visual impacts, including sequential effects along key routes such as tourist routes and public rights of way.

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8. Suggestions for Enhanced Development Management Practice and Process

- 8.1 The project brief requires this study to make recommendations on planning application validation requirements for wind energy applications. However, as the findings of this report are varied in their scope and highlight issues of varying significance for day-to-day decision-making and planning practice in relation to wind energy proposals in Northumberland, this section expands upon that requirement to address a broader range of issues.
- 8.2 Study findings that identify common shortcomings or inconsistencies associated with LVIA and Heritage Assessment elements of ESs offer evidence of direct relevance to officers and Members dealing with future wind energy planning applications. These may or may not have been significant in the determination of the planning applications that they supported, and this study does not analyse the merits of those decisions. However it is clearly beneficial for supporting materials to planning applications for wind energy developments to as best as practically possible present material that offers the LPA and other stakeholders an accurate interpretation of predicted impacts. The following points are presented which seek to further such aspiration.

Effective Engagement of LPA and Stakeholders at ES Scoping Stage

- 8.3 Considerable benefits could be realised through effectively and authoritatively influencing the scoping stages of the ES process such that eventual outputs are more representative, reliable and pertinent to the decision-making process in landscape and heritage contexts. This may be particularly important in respect of appropriate viewpoint and visualisation method selection and identification of sensitive heritage asset settings and important viewpoints and vistas. These issues amongst others are outlined as follows:

Choice of Viewpoints for Visualisations and Impact Assessment

- 8.4 The study has found a number of viewpoints used within ESs to be unrepresentative of general views to the turbines or suggested lower visual and character impacts than were actually observed, occasionally in very close proximity to viewpoints which were effectively screened or partially obscured from the turbines. LPA Officers and stakeholders were found to have been generally (but not always) consulted upon the selection of viewpoints prior to the ES process but such shortcomings have nevertheless occurred. It is important the LPA and key stakeholders (such as the NPA, English Heritage and Natural England) afford *significant importance and focus* to the LVIA and Heritage Assessment scoping processes by carefully considering and advising *more specifically* where viewpoints

should be selected. In accordance with guidance in GLVIA, viewpoints may be chosen as representative viewpoints, specific or illustrative viewpoints, to cover as wide a range of situations as is reasonable and necessary to cover the likely significant effects. However, in determining planning applications it will be necessary always to take a view on the relative benefits and harm a proposal is likely to present. Hence it is critical that the true, (or as near to true as reasonably possible) visual, character and heritage effects are represented in the ES, including from a comprehensive range of the most sensitive receptors (including important settings of historic assets) *as well as* 'typical views'. In determining planning applications for any development, the LPA must be confident that the balance of judgements reached between the benefits of the proposals and any residual adverse impacts (after mitigation) take account of the most significant of those impacts. It may be considered therefore that presenting visualisations from viewpoints which present representative views from particular areas and distances is of value, but far less so than ensuring all sensitive receptor impacts are accurately considered.

- 8.5 Closely related to this issue is the need for more accurate indications of viewpoint location included within LVIA Viewpoint visualisations. Specific care is needed in ensuring that site indication maps, grid references, location descriptions and photograph locations are fully consistent and without ambiguity. An opportunity to improve clarity would be to require that viewpoint locations are always indicated within ESs on 1:25,000 base OS map extracts (rather than the commonly used 1:50,000 scale maps identified widely by this study). Significant difficulty was experienced in accurately locating several viewpoint locations across the study sample and discrepancies were observed between GPS grid references, map indicators and visual reference points. This was more pronounced on older visualisation material, particularly prior to widespread GPS use, but also where landscape changes over 10 or more years have served to alter the visual references within the visualisation. Transitional farmland/moorland locations characterised by commercial plantations are particularly susceptible to difficulties in using visual references because of the ever-changing extent of woodland cover and tree growth. Discrepancies between GPS readings were noted and reference to such alone is likely to be inadequate in locating visualisation points.

Choice of Visualisation Types

- 8.6 The choice of visualisations within the study sites was also found to present problems in assessing the likely effects of the proposals, particularly whilst in the field. Primarily, the use of wireframes for longer distance viewpoints proved particularly difficult to use, even for experienced professions. This was in the main due to the under-representation of actual prominence (scale) (see following paragraphs) but also to difficulties in identifying proposed turbine sites in relation to

actual landscape features which the wireframes do not include. Even with the wind farms installed, matching actual visual effects to those anticipated in the field proved challenging, and in most cases unhelpful. Whilst cost implications may arise for the developer in preparation of photomontages, these proved to be considerably more useful in anticipating proposals' landscape effects (notwithstanding inaccuracies and scale issues observed), than wireframes in medium to longer views. Although wireframes do present some benefits in emphasising turbine locations at distance, wherever possible these should be used *alongside* photomontages such that accurate location and relationship with landscape features can be assessed.

Representative Indications of Scale

- 8.7 Whilst the use of photomontages was found to be helpful in assessing landscape effects, clear differences were observed in relation to the view experienced by the naked eye to that presented in visualisations, even when viewed at the correct viewing distance (paper image to the eye). Those images utilising (then) industry standard 50mm focal length lenses *consistently and significantly* reduced the scale and prominence of all landscape features to that viewed by the naked eye. In doing so (and notwithstanding caveats set out in the LVAs which stress the limitations of visualisations) an increased risk of determination of the application under unrealistic impression of likely visual impact clearly occurred. The study has found that the most recent best practice guidance from Scottish Natural Heritage⁴⁷ requiring (amongst other technical settings) photographic images to be prepared at a 75mm focal length *equivalent* presents a much greater degree of accuracy, offering representative images of scale to those experienced by the individual in the field.
- 8.8 In setting validation requirements for wind energy planning applications, NCC should require any visualisation material deemed appropriate in anticipation of visual and landscape character effects of proposals to be prepared in accordance with Scottish Natural Heritage best practice or subsequent recognised best practice. This should include submission of separate visualisations for each viewpoint to avoid the need to carry full ESs or other unwieldy documents when checking visualisations in the field. Decisions regarding likely effects should only be made with the benefit of site visits.

Layout Accuracy and Visualisation Anomalies

- 8.9 A number of visualisations were found to have presented inaccurate siting of the turbines in relation to the constructed sites (see Technical Appendix for detailed viewpoint records). This is despite others within the *same* ES appearing to be

⁴⁷ Scottish Natural Heritage, Visual Representation of Wind Farms, Version 2 July 2014

relatively accurate. Such anomalies are difficult to predict or explain and may have arisen from software or human error and/or from non-compliance of turbine siting with the final planning approval. Such observations could not be simply attributed to 'micro-siting' variations. Nevertheless, this experience suggests that very thorough examination of visualisations against turbine siting plans should be undertaken in the processing of applications. Moreover, it may be pertinent to require examination and approval of detailed site construction plans, post decision-making, but pre-construction, so as to ensure compliance with permissions, or to consider the extent of acceptable micro-siting variations. Notwithstanding this proposal, even where discrepancies between installed turbines and visualisations were most pronounced (such as from Cateran Hill towards Middlemoor and Wandylaw Wind Farms), this study did not necessarily find that overall landscape *character* impacts were materially altered, although very specific visual impacts and lines-of-sight implications could potentially arise.

Cumulative Impacts

- 8.10 Cumulative impacts are an essential component of any environmental assessment of a wind farm's impact on landscape and sensitive visual receptors. The study found considerable variation in the quality of cumulative landscape and cumulative visual impact assessment undertaken in the ESs reviewed which is to be expected given the 14 years that separate the material. The number of wind farm developments and the potentially high level of visibility of turbines mean cumulative impacts are more likely. Much has been done in Scotland to address definitions and interpretations of cumulative landscape and visual effects of wind farm development and the resulting guidance is now widely used throughout the UK. Nowhere near this level of guidance was available at the time that most of the ESs reviewed were written. This is still recognised (for example in current guidance in GLVIA⁴⁸) as an evolving area of practice.
- 8.11 Prediction of cumulative impacts was undertaken in the majority of the study sample wind farm applications to varying degrees of added value. Primarily these took the form of selected visualisations of both wireframe and photomontage types within which the application site and existing or proposed wind farms were also shown. These were supported with narrative based-assessments offering professional interpretation of likely significance of effect. Detailed systematic method for reaching such conclusions would generally not be based on further methodology than presented for the wind farm in isolation.
- 8.12 Consistent with ES predictions, at the time of the study cumulative impacts had not yet been found to give rise to significant in-combination visual or landscape

⁴⁸ Landscape Institute and Institute of Environmental Management & Assessment, *Guidelines for Landscape and Visual Impact Assessment*, Third Edition, 2013

character effects across the county. A greater concentration of wind turbines towards the southeast of the county (Lynemouth, Bewick Drift, Blyth Harbour and Cramlington MSD) do present views and vistas from a variety of locations in which more than one of these installations is visible, a phenomena influenced heavily by the low coastal plain topography. As such, cumulative effects can be seen to arise. However, the combination of distance between the individual wind farms, the developed urban fringe and industrial landscapes within which they are located has resulted in no *significant* cumulative harm arising in respect to landscape character or visual impact on specific receptors. In the west and north of the county there are again opportunities for inter-visibility between wind farms, most notably in relation to Middlemoor and Wandylaw Wind Farms, where their proximity to one another is such that the twin arrays read visually as one in most views, particularly from the coastal strip to the east.

- 8.13 Assessing the likelihood of cumulative impacts is inherently difficult in relation to the anticipation of potential impacts from proposals at earlier stages of the planning process, which may either not gain planning permission or may not come forward due to other considerations (such as those rehearsed for Green Rigg and Wingates Wind Farms). However this is a problem in reaching a balanced planning judgement rather than one of anticipating potential landscape, visual and heritage effects. Here it will remain necessary to maintain a precautionary approach to predicted impacts through anticipation of 'worst case' scenarios (i.e. where all proposals come forward and are implemented. Observed more recent practice in respect to cumulative impacts was found to be sound in respect to the preparation of cumulative visualisations, such as for Wingates. In most respect the recommendations set out within this report in relation to planning application material and ES material for individual wind farms applies equally to outputs in relation to cumulative effect predictions.
- 8.14 Best practice for the consideration of cumulative effects of wind energy developments is set out in SNHs 2012 Guidance note⁴⁹. It is proposed that NCC embrace the principles and procedures set out within this comprehensive guidance in its Development Management procedures. It is important to emphasise the need to indicate the purpose and scope of a cumulative assessment from the earliest opportunity to assist developers to understand the LPA's concerns and set the scope of the ES. Opportunities to *insist* on cumulative assessments to be added or broadened once an application and supporting material has been submitted and registered can diminish with time under NPPF principles, GPDO processes and EIA Regulations. Hence, early indication of this requirement is essential and overt

⁴⁹ Scottish Natural Heritage, Assessing The Cumulative Impact Of Onshore Wind Energy Developments
March 2012

requirement for such assessments in the emerging policy framework for wind energy is therefore supported.

- 8.15 Greater familiarisation of these findings and matters, possibly through preparation of an internal practice note and/or training would be likely to allow more confidence in achieving robust and informed consideration of wind energy proposals, better application of policy, and hence achieving a net benefit to the landscape and heritage assets of the county. Preparation of a more widely available Supplementary Planning Document in relation to applications for wind energy development may offer further benefits through its dissemination across the development industry and other stakeholder groups. With regard to assessing cumulative effects, SPD could stipulate, for example, an assessment of sequential visual effects as a 'journey scenario' to predict likely effects on recognised tourist routes such as the coastal route and national trails within Northumberland.

Proposed Validation List for Wind Energy Developments

- 8.16 This study suggests that specific validation requirements (a *Local List*) should be prepared in relation to wind energy proposals arising in Northumberland. In light of the specific scope and findings of this study, and having regard to the experience gained in field survey and ES review, the following requirements are proposed as important components in ensuring the effective provision of material supporting any such application. It is important to note that these recommendations address matters of landscape, visual and heritage assets only. Matters pertaining to ecology, residential amenity and radio/radar signal interference etc. should also be included within an adopted list.
- 8.17 Figure 21 presents a model 'Local List' in relation to validation requirements for wind energy developments in Northumberland.

Figure 21: Draft Validation Requirements

Dependent primarily on the scale of development and the sensitivity of the application site, planning applications for the erection of wind turbines and associated infrastructure will be required to be supported by appropriate and adequate information, whether within an Environmental Statement (where required under the Town and Country Planning (Environmental Impact Assessment) Regulations 2011) or as part of an 'appraisal' or non-statutory environmental report (where EIA thresholds are not exceeded). These should include:

Landscape and Visual Impact Assessments

Identification and assessment of the significance of and the effects of change resulting from wind farm development on the landscape. Reference should be

made (in the short term*) to:

- The Northumberland Key Land Use Impacts Study;
- the Northumberland Landscape Character Assessment 2010;
- Tynedale and Northumberland National Park Landscape Character Assessment, 2007;
- Northumberland Historic Landscape Characterisation; and
- *(Pending preparation) Iconic Viewpoint/Viewcone and Heritage Outlooks Sensitivity and Capacity to Wind Energy Study^{50*}*
- *As appropriate*, neighbouring authority adopted SPD which set out good practice and pertinent local considerations for cross boundary effects.

Consider the inter-relationship and effect of the proposal on the particular landscape character of the location and on character areas beyond the site but where views from it are important components of its character, particularly nationally designated landscapes.

The most appropriate study area / Zone of Theoretical Visibility for the nature of the development proposed will be agreed in advance with the LPA (see below).

Identification and assessment of the significance of and the effects of change resulting from wind farm development on the people's views and visual amenity. Consider the visual impact and significance of the proposals upon a range of receptor sites, including residences, visitor sites/recreational sites/the PRoW network); workplaces and transport routes (particularly cycle routes, the A1, coastal routes, routes serving the Northumberland National Park and North Pennines AONB, and the East Coast Mainline). Consideration should be given to sequential views along important routes.

Consider the extent and significance of any cumulative impacts of the proposal in combination with existing and consented wind farms/turbines or other existing and consented structure(s) or visually prominent land uses within an appropriate range of the proposed development dependant on size and scale.

Methodologies of any assessment should closely follow established and prevailing best practice at the time, including:

- Landscape Institute and IEMA, *Guidelines for Landscape and Visual*

⁵⁰ * A recommended output in combination or as part of the proposed Northumberland Wind Energy SPD

Impact Assessment (GLVIA 3) (2013)

- Landscape Institute Advice Note 01/11 *Photography and Photomontage in Landscape and Visual Impact Assessment*. (2011)
- Scottish Natural Heritage, *Visual Representation of Wind Farms*, Version 2 (July 2014)
- Scottish Natural Heritage, *Assessing The Cumulative Impact Of Onshore Wind Energy Developments* (March 2012).
- Neighbouring Authority adopted best practice notes/SPD etc. as *appropriate* to the site and proposals.

In following best practice in LVIA, application should be made of locally prepared⁵¹ matrices of receptor sensitivity, magnitude of change/effect and relative significance of landscape and visual (including cumulative) effects considered most appropriate to the Northumberland landscapes

The application should normally be supported by the following types of visualisation material from specific viewpoints agreed in advance with the LPA:

- Cartographically illustrated expression of the Zone of Theoretical Visibility for the proposal (range set out below dependent upon turbine size) on Ordnance Survey base map at not less than 1:50,000 scale;
- Appropriate photographic baseline illustrations of the landscape at the application site and from agreed viewpoints;
- Computer generated wireframe diagrams and verifiable photomontages for the development prepared in accordance with the above listed best practice and guidance. Where wireframes are prepared they should be superimposed over a photographic baseline image.

Heritage Assessment

For the purposes of this report, the recommendations for heritage assessment requirements relate to indirect effects on setting only.

Assessment of the effects and significance of the proposals on the special heritage resource of the county. A heritage assessment will be required in relation to all wind energy proposals (above micro-generation schemes). The assessment will cover the individual effects of the proposals and in-combination (cumulative with existing, consented and screening stage wind energy proposals) on:

- Listed Buildings
- Conservation Areas

⁵¹ Recommended as an outcome of this study

- Scheduled Monuments
- Hadrian's Wall World Heritage Site and the World Heritage Site buffer zone
- Registered Parks and Gardens, and Battlefields
- Where relevant, buildings and structures from the County's Local List of non-designated sites.

In undertaking such an assessment, the sensitivity of the assets(s) should be attributed to reflect its designation status and any particular historic or cultural importance attached to the specific outlook.

Of particular importance will be the need to have carried out an assessment of the impact upon important views from and towards the county's important heritage sites. For example, heritage assessments for wind energy proposals will be expected to have assessed potential impacts upon:

- Main lookouts and vistas from the county's distinctive castles and defensive structures
- Views towards these buildings and their distinctive landscape setting, such as coastal location or other strategic positioning
- Designed views and lookouts from historic parks and gardens.

As wind energy developments of different scales are likely to present differing visual and landscape character impacts, different parameters for supporting material requirements are likely to be appropriate. SNH guidance on standards for wind farm visualisations (2014) represent a starting minimum requirement based on heights to blade tip. These should be adopted within supporting materials. Additional information may be required at the Council's discretion where visual impacts are potentially more significant or the environmental and heritage context is particularly sensitive to effects.

8 figure grid references for each wind turbine proposed shall be supplied and indicated clearly on a Ordnance Survey base map at not less than 1:25,000 scale.

8 figure grid references for each viewpoint /visualisation location (agreed with the LPA in advance) shall be indicated clearly on a Ordnance Survey base map at not less than 1:25,000 scale.

Planning applications which do not meet the minimum requirements for the provision of supporting material, prepared to appropriate standards, will be at risk of not being registered until all required materials are supplied to the above standards.

Appendix A1

Viewpoint Selection Tables by Wind Farm

Table A1: Wingates Viewpoints

View-point No.	Description from ES	Justification	Distance to nearest turbine
1.	Embleton Terrace	Existing photomontage. Sensitive viewpoint from elevated road.	2.4km
2.	Longframlington	Wireframe only but sensitive PRoW on edge of settlement.	6.4km
4.	West of Longhorsley	Existing photomontage. Sensitive viewpoint from elevated PRoW on edge of settlement.	4.7km
5.	PRoW near Wingates Moor Farm	Existing photomontage. Sensitive viewpoint from road/PRoW.	1.4km
6.	A1 Corridor, Morpeth.	Wireframe. View from A1 fleeting and at over long distance.	13km
7.	Folly House	Wireframe only but prominent view from public highway.	1.6km
8.	Longwitton	Wireframe only but prominent more distant view from public highway and dwellings.	5.7km
10.	Codger Fort	Wireframe only. Sensitive heritage receptor. Prominent vistas. Cumulative issues in same view.	5.9km
11.	Knowesgate	Wireframes only. Sensitive viewpoint from elevated public highway with expansive vistas.	12.4km
12.	Coldrife	Sensitive vista. Wireframe only. Close proximity.	1.3km
13.	Simonside 'The Beacon'	Wireframes only. Sensitive receptor from within National Park and iconic viewpoint(s)	c5-6km
14.	The Cheviot	View from Cheviot summit. Distant. Site visited but no view possible.	30km.
15.	Garleigh Moor Cairn*	Sensitive receptor. Wireframes. Close parallels in sensitivity, bearing and distance to Viewpoints 13.	5km
16.	Ship Crag, Rothbury	Sensitive receptor above significant settlement and population. Cumulative issues within same vista.	7.8km

* at project team request

Table A2: Wandylaw Viewpoints

View-point No.	Description from ES	Justification	Distance to nearest turbine
1.	Eastern edge of Warenford Village	Includes cumulative photomontage with Middlemoor	3.5km
2.	Road heading west out of North Charlton Village	Existing photomontage	2.9km
3.	Triangulation Point, Eglington Moor	Includes cumulative photomontage with Middlemoor	3.7km
4.	Ros Castle, Chillingham	Sensitive viewpoint at Ros Castle from wind farm - includes cumulative photomontage with Middlemoor	4.2km
5.	The Priory, Holy Island	Sensitive view from Holy Island in AONB (although no existing photomontage to compare)	15km
6.	B1340 to the south of Bamburgh Castle	Existing photomontage; sensitive viewpoint near Bamburgh Castle just beyond study area	10km
7.	Road heading south-west out of Craster Village	Sensitive viewpoint in AONB - includes cumulative photomontage with Middlemoor	10km
8.	B6341 west of Alnwick	Existing photomontage; viewpoint on B6341 west of Alnwick	10km
10.	St Cuthbert's Way near a Triangulation point, Gains Law	No existing photomontage to compare and remote, but important long distance footpath through Northumberland National Park;	17km
12.	Langlee Crags*, south of Harthope Burn	Langlee Crags in the Cheviots is remote from wind farm but lies within the National Park as a popular walking destination.	16km

** at project team request*

Table A3: Middlemoor Viewpoints

View-point No.	Description from ES	Justification	Distance to nearest turbine
1.	Ros Castle	Sensitive viewpoint at Ros Castle (same as Wandylaw viewpoint 4)	6km
2.	Cateran Hill	Sensitive viewpoint at Cateran Hill	3.4km
3.	South-west of Ditchburn	Existing photomontage	2.3km
4.	A1 south	Existing photomontage	3.9km
5.	Coastal strip east of site	Sensitive viewpoint on edge of AONB	6.6km
6.	Seahouses Area	Sensitive viewpoint in AONB	10km
8.	A1 North	Sensitive view from A1	5.6km
9.	Holy Island	Sensitive view from Holy Island in AONB (although no existing photomontage to compare, potential cumulative impact with Wandylaw); same as Wandylaw viewpoint 5	15km
10.	Eglington Area	View from minor road	6km
11.	The Cheviot	Sensitive viewpoint at The Cheviot within the National Park	over 22km
14.	Minor Road east of NNP	Sensitive viewpoint on National Cycle Route and close to National Park	
15.	Above Hulne Park*	Sensitive viewpoint overlooking Hulne Park – within Brizlee Wood Radar base.	11km
16.	Bamburgh Castle	Sensitive view from close to Bamburgh Castle in AONB (although no existing photomontage to compare, potential cumulative impact with Wandylaw)	10.8km
17.	East of A1	View from Coastal Plain	3.8km
18.	West edge of Embleton	Sensitive viewpoint on edge of AONB	6.4km

- *at project team request*

Table A4: Kiln Pit Hill Wind Farm Viewpoints

View-point No.	Viewpoint Name / Description	Reason for inclusion in study	Distance to nearest turbine
1.	VP1 Shotleyfield	Representative of close view; photomontage	0.8km
3.	VP3 Greymore Hill	Representative of close view; photomontage	1.1km
4.	VP4 Kiln Pit Hill	Representative of close view; listed building; photomontage	
6.	VP6 Muggleswick Common	Representative of long distance view; AONB & AHLV; photomontage	9.1km
7.	VP7 Derwent Reservoir	Representative of middle distance view; AONB & Country Park; photomontage	4.9km
9. (+22 & 28)	VP9 + 22-28 St. Andrews Church & The Hopper Mausoleum	Representative of close view; setting of Grade I & II listed buildings subject to English Heritage objection; photomontages	0.9km
10.	VP10 Benfieldside Road	Representative of middle distance view; photomontage	4.3km
12.	VP12 Derwent Valley, Ebchester	Representative of middle distance view on PRoW; (no photomontage)	4.8km
18.	VP18 B6318 east of A68 Roundabout	Representative of long distance view; Hadrian's Wall WHS; (no photomontage)	15.2km
19.	VP19 SW of Whittonstall on road to Ebchester	Representative of middle distance view; looking towards AONB; (no photomontage)	3.3km
C3.	Cumulative VP3 B6318 Military Road	Representative of long distance view from National Park; Hadrian's Wall WHS; no photomontage but includes cumulative assessment	24.3km

Table A5: Boundary Lane Wind Farm Viewpoints

View-point No.	Viewpoint Name / Description	Reason	Distance to nearest turbine
1.	Footpath from Boundary lane	Representative near, prominent, open view. photomontage	0.3km
3.	Hopper mausoleum	Elevated open vista, heritage value? photomontage	2.8km
4.	Shaw Lane, Ebchester	Edge of settlement, heritage value? Middle distance. photomontage	2.8km
5.	Derwent Walk, Shotley Bridge	Edge of settlement, recreation value. photomontage	3.6 km
6.	Alston Road, Consett	Views from within large settlement. photomontage	4.4km
9.	A692, Moorside	Settlement views, transport corridor, middle distance. photomontage	6.5km
11.	Burnopfield	Edge of settlement, elevated, recreation value? Wireframe.	8.5km
14.	Muggleswick Common	Expansive moorland setting in AONB, Green Lane/BOAT, rec value. Wireframe	11.2km
17.	B6318, east Portgate Rndbt.	Hadrian's Wall fp., Heritage value. Wireframe	15km

Table A6: Kirkheaton Wind Farm Viewpoints

View-point No.	Viewpoint Name / Description	Reason	Distance to nearest turbine
1.	Tongues Farm	Limited viewpoints in ES, all assessed	1.5km
2.	Hallington Village	Limited viewpoints in ES, all assessed	2.5km
3	Cocklaw Walls	Limited viewpoints in ES, all assessed	1.5km
4.	Kirkheaton	Limited viewpoints in ES, all assessed	820m
a.	Maften 'Line of sight'	Limited viewpoints in ES, all assessed	5.8km
b.	Ingoe 'Line of sight'	Limited viewpoints in ES, all assessed	3.5km
c.	Wallridge 'Line of sight'	Limited viewpoints in ES, all assessed	5km
d.	Kirkheaton 'Line of sight'	Limited viewpoints in ES, all assessed	820m

Table A7: Green Rigg Wind Farm Viewpoints Viewpoints

View-point No.	Viewpoint Name / Description	Reason	Distance to nearest turbine
1.	Footpath, Great Wanney Crag	Near distance, elevated, recreation asset.	0.8km
4.	A68, Carrycoats Hall	Near distance, transport corridor, heritage asset?, partial views/ multiple tips over horizon.	1.6km
6.	Local Road, Raw Side * Bellingham	Middle distance, open vistas, on boundary of Northumberland National Park	3.8km
7.	A696, Knowesgate	Transport route, middle distance from east, open vistas over mixed pasture and woodland landscape, edge of settlement.	6.5 km
10.	B6320 Bellingham	Edge of settlement, NNP, National Cycle Route.	7.7km
11.	B6318, Carrawbrough (Hadrian's Wall)	Distant view from main transport corridor and significant heritage asset, NNP, National cycle route, NNP	10km
13.	Simonside	Popular recreation site, NNP, distant vista	18.7km

Table A8: Cramlington MSD Viewpoints

View-point No.	Viewpoint Name / Description	Reason	Distance to nearest turbine
1.	Top of Nelson Pit	Prominent local access point. photomontage	2km
4.	Seaton Sluice Roundabout	Edge of settlement, longer view over settlement. photomontage	10 km
6.	Stannington	Prominent open middle distance vista over open landscape. photomontage	2.9km
9.	Big Water Park	Important public amenity, middle distance. photomontage	5.3km
10.	Nr Plessey	Near distance prominent viewpoint. photomontage	0.5km
11.	Nr Nedderton Hall	Edge of settlement view, heritage interest? photomontage	3.1km
13.	North Plessey Woods	AHLV. Potentially prominent, Amenity	2.2 km

		value? photomontage	
14.	A19 Arcot Hall	Important transport corridor, potential heritage impacts? photomontage	3.8km

Table A9: Lynemouth Wind Farm Viewpoints

View-point No.	Viewpoint Name / Description	Reason for inclusion in study	Distance to nearest turbine
2.	Lynemouth Cemetery	Representative of close view; photomontage including A1 size	0.6km
4.	A1068 SW of Site	Representative of close view; photomontage including A1 size	0.8km
5.	Linton	Representative of close view; photomontage including A1 size	0.6km
8.	North Seaton	Representative of middle distance view photomontage including A1 size	3.2km
9.	A189 & cycle route	Representative of middle distance view; photomontage including A1 size	3.4km
10.	Newbiggin-by-the-Sea	Representative of middle distance view; photomontage including A1 size	2.3km
14.	Pegswood	Representative of middle distance view; photomontage	4.9km
15.	Widdrington Station	Representative of middle distance view; photomontage	3.6km
16.	Druridge Bay	Representative of middle to long distance view; no photomontage but sensitive VP in Country Park	8.9km
17.	A697 Longhorsley Moor	Representative of long distance view; no photomontage but includes cumulative assessment	10.1km
18.	A1 near Morpeth	Representative of long distance view; no photomontage but includes cumulative assessment	10.1km

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Appendix A2

Extract Emerging Findings Recommendations for Policy 37 Refinement (September 2014)

A7.6 Suggested specific amendments and identification of where further work to develop understanding would be appropriate are set out as follows, based upon the component parts of Policy 37 (emphasis added for clarity):

Criterion i) *'The large scale development of wind turbines, or groups of turbines will be supported, unless the environmental and economic benefits of the proposal are clearly outweighed by significant adverse impacts upon:.....'*

A7.7 **Suggested Change(s)** – For avoidance of doubt, the opening statement to the policy might be refined to ensure that policy addresses *individual* turbines of a larger physical size (specific scale thresholds to be considered – possibly 25m or more to hub height to reflect the middle paragraph of the policy). A simple re-ordering of words to ***'The development of large wind turbines (over 25m in height) individually or as wind farms,....'*** Would help achieve this potential ambiguity in draft policy.

Criterion ii) *'The large scale development of wind turbines, or groups of turbines will be supported, unless the environmental and economic benefits of the proposal are clearly outweighed by significant adverse impacts upon:.....'*

A7.8 Quantifying what would constitute a *significant adverse impacts* will often entail a degree of professional judgment that may or may not be consistent with that of the developer (and identification of significant effects through ES processes), elected members, LPA officers, Inspectors or the public. The previous section of this report recognises the complexity in arriving at a robust assessment of the significance of effects, and how categorisation of sensitivity, magnitude of change can influence such statements of significance. The residual effects of wind energy developments on the environmental and heritage resources of the county can be systematically (and hence consistently) quantified through the application of LVIA best practice using a function of receptor (site/area/heritage feature) *sensitivity* against the *magnitude* of change on that receptor, but the application of values to sensitivity and magnitude will inherently be based to some extent on (professional) judgment.

A7.9 This study has generally found that considerations of *significance* set out in the 3 initial ES LVIAs and Cultural Heritage Assessments have been, in most instances, arrived at transparently, and with which the consultants have mostly agreed with

those assessment. In a small number of instances the significance of effect at certain receptors has even been over-stated. However, there is also a greater number of instances when the significance of change has been under-estimated in the opinion of this report. It is desirable therefore to seek to minimise the opportunity for inconsistent judgments to be embedded within ESs supporting applications for wind energy developments (although removing this completely would be unlikely).

- A7.10 The Northumberland Key Land Use Impact Study 2010 sets a useful baseline for identifying the sensitivity of the county's Landscape Character Areas to wind energy developments and reference to this (or an equivalent updated resource) could be considered in respect to scoping of Environmental Statements and/or be required to be included by local validation lists within planning statements. In addition it may be appropriate to consider the value in preparing a county-wide assessment of important (and hence sensitive) views or outlooks which contribute to the wider heritage and tourism/recreation value of Northumberland and which for the purposes of assessing significant wind energy developments (and other infrastructure). An area which this study has provisionally identified as being under-represented in the case of the initial study sites has been *views from significant heritage assets, particularly along the coastline, and from the AONB coast generally*. The 2013 study into landscape capacity for wind energy developments within the Northumberland Coast AONB⁵² recognised and identified a series of viewpoints and view-cones from iconic heritage sites or important landscape features, within which visual sensitivity to major infrastructure development was particularly high. Such considerations, including from sites within the National Park, could be rolled out for application county-wide within policy.
- A7.11 **Criterion iii)** *'b) Long range views of and from the Cheviot, Simonside Hills, and the Outcrop Hills and Escarpments of the Northumberland Sandstone Hills National Landscape Character Area which are important to the character and quality of the landscape;...'*
- A7.12 Field survey observations suggest that the significance (and importance and value applied by Inspectors at Public Inquiry) of visual and landscape character effects on extensive areas of the Northumberland Coast AONB from Wandylaw and Middlemoor Wind Farms have been underplayed. The visual and character effects of these two Wind Farms in-combination is considered to be significant in respect to a perceived 'hemming-in' of a significant stretch of the narrow coastal strip by a extended line of 28 turbines, each 125m in height. This is particularly evident when travelling north and south along the network of highways and minor roads within

⁵² *Landscape Sensitivity And Capacity Study*, Bayou Bluenvironment & The Planning and Environment Studio, June 2013

and immediately outside the AONB for a significant distance. Appreciable visual prominence was experienced from as far south as Embleton village centre, and as far north as Holy Island. Exacerbating this impact is the siting of the turbines on the distinctive ridge of higher land falling between the AONB and National Park to the east and west respectively, highly visible from important transport corridor of the A1 and East Coast Mainline. In many places within this area, the presence of the turbines is significant and can be seen to erode the sense of remoteness which the designated landscape has long been associated with and which still pervades further to the north.

A7.13 In addition to this impact, the Northumberland Coast AONB is blessed with some of the nation's most treasured historic buildings, from which several vistas are significant on locally raised outcrops, such as Bamburgh Castle, Lindisfarne Castle and Dunstanburgh Castle. Whist vistas from these tend to lead the eye out to sea and along the coast itself, views inland can be expansive and dramatic. A prime example would be from the parapet and ramparts of Bamburgh Castle. Views inland from these sites, as well as dune-top paths which partly characterise the nationally designated landscape, can now be found to have prominent views of the Middlemoor and Wandylaw arrays, and in the consultants' opinion have changed the visual and perceptual 'experience' of those views significantly. Iconic views from the public look-out on Holy Island, where vistas to the south are particularly significant – (and possibly justifying *iconic* value at the national level), are now appreciably interrupted by the presence of the two wind farms in the same sweeping vista as the Farne Islands, Bamburgh Castle, the estuary and to the brooding mass of Cheviot to the west.

A7.14 Whilst it might be seem now that the previously 'horizontal' character and uncluttered natural 'framing' of the landscape to the west of the AONB has been seriously eroded in the longer term, it is considered expedient to strengthen the degree of policy protection from this being exacerbated by further prominent wind energy development west of the AONB's coastal strip. Notwithstanding the strategic policy to protect the valued characteristics of the AONB in draft policy 50 '*Natural and Historic Environment*' of the plan, it would seem appropriate to expand the principle established within '*criterion b*' with an additional criterion which seeks to protect long-range views of and from the iconic sites and features of the Northumberland Coast AONB.

A7.15 Suggested additional policy criterion to policy 37:

'xx) *Long and medium range views and lines-of-sight between iconic landscape and heritage sites and features, particularly where one or more feature is within the Northumberland National Park, Northumberland Coast AONB or North Pennines AONB;*

- A7.16 Alternatively, the final paragraph of draft Policy 50 which addresses wind energy development *within* the two AONBs of the county (i.e. preceding the ‘*additional requirements*’) could be expanded to address this weakness using similar wording as suggested above.
- A7.17 A Supplementary Planning Document in respect to where such lines-of-sight and view-cones are identified should be considered as a possible method to add clarity to the scope and application of this proposed additional criterion.

Criterion Omission: Visual Impacts On and Between Heritage Assets

- A7.18 These emerging findings have focused attention on the effects of large scale wind energy development on important heritage assets *outside* the Northumberland Coast AONB, (see section 3), and field survey work has clearly suggested that there is evidence of harm to the setting or important outlooks from heritage sites across the whole county. In some instances this report suggests that the degree of impact caused to heritage assets has been underplayed by ES material. A particularly significant example of this was the outlook from Preston Tower, a Peel Tower located to the east of the Wandylaw and Middlemoor arrays. Views from the ramparts (lookout) to the west are dominated by the presence of the wind farms. No visualisation in the ES was prepared for this view, whilst a particularly ‘screened’ viewpoint was selected within a short distance from it. The heritage assessment of the ES, considered any potential harm to be not significant. Other examples of the prominence of the study wind farms in important views from heritage assets were experienced at Codger Fort, Cateran Hill and Ros Castle, the latter particularly important as a consequence of spectacular vistas from one cultural heritage site to others such as Dunstanburgh Castle. These sites partially owe their being and significance to original purposes of look-out and defence, and by definition those views can be seen to potentially constitute import heritage components.
- A7.19 In this context it would be appropriate to present a further criterion in Policy 37 to have full regard to the importance of protecting recognised outlooks from heritage sites outside the AONBs.
- A7.20 Suggested wording / additional criterion:
‘xx) *Important recognised outlooks and views from heritage assets where these remain predominantly unaffected by harmful visual intrusion;*’
- A7.21 **Policy Paragraph 2:**
‘*Within the North Pennines and Northumberland Coast AONBs there will be a presumption against wind energy developments of more than one turbine, or turbines with a hub height of 25 meters or more.*’

A7.22 Notwithstanding the following section of the policy (*part ii*), this criterion of draft policy can be seen to overlook the potential harm caused by the development of individual turbines, such as those serving a rural business or farm, in close proximity to one another or within a discreet area of landscape which would be presented as separate and individual proposals. Policy could be refined to have regard to such possibilities through explicit reference to the need for cumulative impact considerations.

A7.23 Suggested wording:

'xx) Within the North Pennines and Northumberland Coast AONBs there will be a presumption against wind energy developments of more than one turbine, or turbines with a hub height of 25 meters or more, or where an individual turbine would in combination with existing turbines serve to create a visual cluster or concentration in the landscape.'

A7.24 **'Additional Requirements':**

- i. 'All planning applications for wind turbine development should be accompanied by rigorous and accurate assessments of all aspects of the proposed development consistent with national guidance, and undertaken in accordance with the latest technical standards and guidance.'*
- ii All planning applications need to assess the cumulative impact of developments, including those with planning consent which have not yet been constructed.*

A7.25 This element of draft policy remains sound, and it is not considered necessary to propose significant amendments to its wording or intention *per se*, apart from supporting text to clarify that national guidance would include that prepared by responsible authorities in Scotland and Wales, such as Scottish Natural Heritage.

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Glossary of Terms

[reproduced from *Guidelines for Landscape and Visual Impact Assessment*, The Landscape Institute and Institute of Environmental Management and Assessment, Third Edition 2013, unless indicated otherwise]

Cumulative effects The additional changes caused by a proposed development in conjunction with other similar developments or as the combined effect of a set of developments taken together [SNH, 2012⁵³]

Cumulative landscape effects Effects that can impact on either the physical fabric or character of the landscape, or any special value attached to it [SNH, 2012⁵⁴]

Cumulative visual effects Effects that can be caused by combined visibility, which occurs where the observer is able to see two or more developments from one viewpoint and/or the sequential effects which occur when the observer has to move to another viewpoint to see different developments [SNH, 2012⁵⁵]

Heritage The historic environment and especially valued assets and qualities such as historic buildings and cultural traditions

Landscape An area, as perceived by people, the character of which is the result of the action and interaction of natural and/or human factors

Landscape and Visual Impact Assessment A tool used to identify and assess the likely significance of the effects of change resulting from development both on the landscape as an environmental resource in its own right and on people's views and visual amenity

Landscape effects Effects on the landscape as a resource in its own right

Landscape receptors Defined aspects of the landscape resource that have the potential to be affected by a proposal

Magnitude (of effect) A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short or long term in duration

⁵³ Scottish Natural Heritage (SNH), *Assessing the Cumulative Impact of On Shore Wind Energy Developments*, 2012

⁵⁴ Scottish Natural Heritage (SNH), *Assessing the Cumulative Impact of On Shore Wind Energy Developments*, 2012

⁵⁵ Scottish Natural Heritage (SNH), *Assessing the Cumulative Impact of On Shore Wind Energy Developments*, 2012

Photomontage A visualisation that superimposes an image of a proposed development upon a photograph or a series of photographs

Sensitivity A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor

Significance A measure of the importance or gravity of the environmental effect, defined by significance criteria specific to the environmental topic

Visual effects Effects on specific views and on the general visual amenity experienced by people

Visual receptors Individuals and/or defined groups of people who have the potential to be affected by a proposal

Visualisation A computer simulation, photomontage or other technique illustrating the predicted appearance of a development

Zone of Theoretical Visibility (ZTV) sometimes referred to as Zone of Visual Influence (ZVI) A map, usually digitally produced, showing areas of land within which a development is theoretically visible