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Landscape Capacity Study for Wind Energy Developments in the South Pennines

Final Report

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1 Introduction

1.1 Planning and Policy Context

The development of renewable energy resources is central to government policy on climate change. This has been reinforced in the recent publication of the *UK Renewable Energy Strategy*[1]. A key theme of the strategy is swifter delivery, with measures being proposed for a strategic and evidence-based approach to energy-related spatial planning at regional and local levels. The strategy refers to the government's Planning Policy Statement 1 (PPS1) supplement on climate change[2] and Planning Policy Statement 22 (PPS22) on renewable energy[3], which already support such an approach; and indicates that national policy on renewable energy is to be further reinforced in coming months by the issue of new National Policy Statements for energy (including renewable energy) and a new combined climate change Planning Policy Statement.

At regional and local levels, effective and proactive strategic planning for renewable energy is therefore set to be a key theme during the ongoing review of Regional Strategies and preparation of Local Development Frameworks; it will also be central to the role of the new statutory City Regions (in Greater Manchester and Leeds) which have planning, economic and other powers devolved from central government.

Within this context, districts in preparing their Local Development Frameworks require information and robust evidence on opportunities for and constraints to onshore wind energy development to enable them to actively plan for and support renewable energy generation. There is also a need to assist decision makers in reaching an appropriate planning balance when considering wind energy development proposals. This study will inform and provide appropriate evidence to support these needs.

1.2 Purpose and Scope of the Study

This study was commissioned by six local planning authorities in the South Pennines, namely Burnley, Bury, Calderdale, Kirklees, Rochdale and Rossendale. The overall aim of the work was to provide a landscape capacity study for wind energy developments to inform and provide a sound evidence base for the production and monitoring of the Local Development Frameworks in the six districts[4]. The brief for the study indicated that it should provide baseline information and assessments but not policy development.

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[1] http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/res/res.aspx

[2] http://www.communities.gov.uk/planningandbuilding/planning/planningpolicyguidance/planningpolicystatements/planningpolicystatements/ppsclimatechange/

[3] http://www.communities.gov.uk/publications/planningandbuilding/pps22

[4] Note that part of Kirklees district lies within the Peak District National Park. The local planning authority for this area is the Peak District National Park Authority, which is preparing its own Local Development Framework and has commissioned separate work on landscape sensitivity to wind energy development, referenced later in this report.

The study objectives were to:

- Identify, at a strategic scale, broad landscape areas which may be able to accommodate various scales of wind energy development subject to detailed appraisal;
- Identify any specific strategic constraints which may reduce the potential of particular landscape areas to accommodate wind energy development;
- Identify any likely cumulative and cross-border impacts of wind power developments;
- In doing the above, assist the local planning authorities in producing Local Development Frameworks, future energy and landscape strategies, and scoping opinions and assessments for wind energy development proposals.

The study brief required the consultants to assess the contribution that the landscape of the study area could make to meeting renewable energy targets; compile a baseline of existing and programmed wind energy developments by type and by district; review existing landscape character assessments and landscape capacity studies for wind energy development; develop and apply a methodology for assessing landscape sensitivity to and capacity for wind energy development; ground truth that assessment; provide a report and mapping to describe and justify the sensitivity and capacity assessment; and provide key landscape criteria and guidelines to assist in formulation of appropriate development proposals.

1.3 Wind Energy Development in the South Pennines

The South Pennines is a highly valued landscape, important scenically as an upland link between the Peak District and Yorkshire Dales National Parks, and recreationally for the countryside experience that it offers to the large nearby urban populations of West Yorkshire, Greater Manchester and south Lancashire. The area is also nationally and internationally important for its habitats (including extensive peat moorland and blanket bog) and for its historical and cultural influence as the seat of the industrial revolution.

Despite these many important landscape resources the area has no statutory national landscape designation. As one of the few upland areas in England without such designation, it is under great pressure for wind energy development. The situation is further complicated by the fact that the area straddles Lancashire, Greater Manchester and West Yorkshire as well as two government regions; in the absence of a coordinated approach this may give rise to differences in policy and decision-making.

It is of key importance that wind energy development in the South Pennines should, as far as possible, be developed in harmony with the surrounding landscape and the needs of other users of the landscape resource, and in a way that is consistent across local authority boundaries. This requires consistent, transparent and robust background information on landscape sensitivity to and capacity for wind energy development to inform the preparation of Local Development Frameworks (including Infrastructure Plans), provide siting and design advice to intending wind energy developers, and guide planning decisions on wind energy development applications in the six local planning authority areas.

This report, which will be referenced in the Core Strategies for each of the six authorities, is intended to meet these requirements, indicating the landscape and visual criteria against which wind energy developments will be assessed. Site identification, design and planning decisions for wind energy development will be informed by the material presented in this report.

1.4 Scope of the Report

This report provides:

- ***broad guidance on the relative sensitivity of each of the landscape character types*** that occurs within the study area, based on systematic assessment of their sensitivity using an explicit set of criteria that encompasses both landscape character and landscape values;

- ***indicative advice on the landscape capacity of different parts of the study area*** (termed capacity areas) for different forms of wind energy development, under headings of constraints, opportunities, guidance, cumulative and cross-district issues and overall capacity (in terms of number of sites, turbine groupings and turbine heights).

The capacity assessment is informed by and complementary to the sensitivity assessment but goes one step further, looking for positive opportunities within the landscape to accommodate wind energy development.

Both the sensitivity assessment and the capacity assessment for a given location should always be read together when considering any specific development site or proposal. The fact that a landscape character type is identified as being of high (or relatively high) sensitivity overall does not mean that it has no capacity for wind energy development in any location.

It is important to note that the study is intended to provide broad, strategic guidance on appropriate locations for wind energy development. However every development proposal is unique, and there remains a need for detailed consideration of the landscape and visual impacts as well as the siting, layout and design of individual applications on a case by case basis.

1.5 Structure of the Report

The report is structured as follows:

- ***Section 2: Assessment Approach*** sets out the broad approach and principles used to prepare the wind energy landscape sensitivity and capacity assessment, including key terms and definitions, sensitivity criteria, a wind energy development typology, and principles affecting capacity.

- ***Section 3: Assessment Process*** briefly describes the main steps in the assessment process, explaining the information sources that were used, the desk and field survey work that was undertaken, and the outputs that were provided to the client authorities.

- ***Section 4: Baseline Assessment*** introduces the South Pennines landscape, reviews the distribution of existing wind energy developments and considers, at a strategic level, their effects on landscape and visual resources, highlighting issues of cumulative impact that may need to be taken into account.

- ***Section 5: Landscape Sensitivity and Capacity Assessment*** describes the spatial framework for the assessment; and provides a sensitivity assessment sheet for each of the 14 landscape character types within the study area and a capacity assessment sheet for each of 12 capacity areas.

- ***Section 6: Landscape and Visual Guidance on Wind Energy Proposals*** explains how to use the assessments sheets and provides good practice guidance on taking landscape issues into account in initial scheme planning; in siting, layout and design; and in the review of development proposals.

- ***Annex 1*** explains how the landscape character types were identified and how they relate to existing landscape character assessments within and around the study area, in addition to providing key characteristics and descriptions of each of the 14 landscape character types referred to in this study.

- ***Annex 2*** provides a map and brief descriptions of each of the local landscape character areas in Bury, Rochdale, Calderdale and Kirklees. This output, which was additional to the main study brief, ensures that each of the six districts included in the study has complete, if basic, landscape character assessment coverage.

- ***Annex 3*** is a bibliography, providing details of information sources used in this study as well as suggestions for further reading;

- ***Annex 4*** provides a list of acronyms.

1.6 How to Use This Report

Figure 1 opposite is intended to assist those using the report (eg planning officers and developers) to assess landscape sensitivity and capacity for wind energy development and to consider issues of siting, layout, design and landscape and visual impacts.

Figure 1: How to Use This Report

Steps and Tasks	Relevant Report Sections	Key Reference Material
Step 1: Review background and collect information ▼		
Understand factors underlying landscape sensitivity	Section 2.3	• Table 3 Landscape sensitivity criteria
Understand factors underlying landscape capacity	Sections 2.4 and 2.5	• Table 6 Principles of fit with landscape character • Table 7 Principles relating to scale and cumulative impact
Consider the South Pennines landscape as a whole	Section 4.2	• Figure 3 Physical features of the study area • Figure 4 South Pennines landscape context
Step 2: Assess landscape sensitivity and capacity ▼		
Identify location of proposed development		• OS 1:25,000 scale map
Identify scale of proposed development		• Table 4 Wind energy development typology
Consider existing wind energy developments and their impacts at a strategic scale	Section 4.5 – text for relevant National Character Area	• Figure 6 Wind energy developments and National Character Areas
Identify landscape character type(s) and capacity area(s) within which the development would sit	Annexes 1 and 2 Landscape character descriptions	• Figure 7 Landscape character types • Figure 8 Capacity areas
Review sensitivity and capacity assessment sheets and consider whether or not location and scale are consistent with advice given. (*If so, proceed to Step 3. If not, identify alternative location and/or scale)*	Sections 5.2 and 5.3	• Relevant sensitivity and capacity assessment sheets
Step 3: Design and assess impacts of proposed development ▼		
If location and scale are appropriate, review and address detailed siting, layout and design issues	Section 6.4	• Table 11 Principles of good siting, layout and design • Guidance and cumulative and cross-district sections of capacity assessment sheet(s)
Assess landscape and visual impacts and if necessary, seek to revise scheme siting, layout and design	Section 6.5	• Table 12 Good practice requirements for landscape and visual impact assessment • Table 13 Checklist of presentation material

2 Assessment Approach and Principles

2.1 Introduction

There is currently no formally agreed approach or method for assessing the sensitivity or capacity of different landscapes to wind energy development. The approach taken in this study is tailored specifically to the South Pennines situation but builds on the consultants' experience from previous similar studies, and on emerging good practice in assessing wind energy landscape sensitivity and capacity (for example in Lancashire, North Yorkshire, Cumbria, Northern Ireland, the Peak Sub Region and the Shetland Islands).

The approach aims to be transparent, robust and defensible. It is consistent with good practice guidance on landscape character assessment and landscape and visual impact assessment, notably:

- Countryside Agency and Scottish Natural Heritage (2002) *Landscape Character Assessment Guidance for England and Scotland*, Countryside Agency and Scottish Natural Heritage.
- Countryside Agency and Scottish Natural Heritage (2004), *Landscape Character Assessment Guidance Topic Paper 6: Techniques and Criteria for Judging Sensitivity and Capacity*, Countryside Agency and Scottish Natural Heritage.
- Landscape Institute and Institute of Environmental Management and Assessment (2002) *Guidelines for Landscape and Visual Impact Assessment*, 2nd edition, Spon.

This section of the report outlines the broad assessment approach and principles. The assessment process is described further in *Section 3*; and the spatial framework for different aspects of the assessment is set out in *Sections 4* and *5*.

2.2 Key Terms and Definitions

Landscape is about the relationship between people and place. It provides the setting for our day-to-day lives and influences our enjoyment of the natural environment. It results from the interaction between different components of the environment, both natural (the influences of geology, landform, soils, climate and habitats) and cultural (the impact of historical and current land uses, settlement patterns, enclosure and other human interventions). Landscapes are everywhere, not just in special or designated places. An important driver behind this approach is the government-ratified European Landscape Convention (ELC), which came into force on 1 March 2007[5]. People value landscapes for many different reasons, related not only to aesthetics and scenery but also to their contribution to recreation and health, wildlife and biodiversity, natural resources and geodiversity, and local culture and distinctiveness. Key terms relating to landscape resources are defined below.

[5] http://www.coe.int/t/dg4/cultureheritage/heritage/Landscape/default_en.asp

Table 1: Key Terms Relating to Landscape Resources[6]

Landscape fabric – Physical landscape elements and features, such as landform, landcover, boundary features, trees and woodland, that make up the landscape we see, and that may be affected for example by recontouring, land use changes, or damage to vegetation in the course of development.

Landscape character – The distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape and how this is perceived by people. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement. It creates the particular sense of place of different areas of the landscape.

Landscape quality (or condition) – A term based on judgements about the physical state of the landscape, and about its intactness, from visual, functional and ecological perspectives. It also reflects the state of repair of individual features and elements which make up the character in any one place.

Landscape value – The intrinsic value that is attached to a landscape, often (but not always) reflected in designation or recognition. It expresses national or local consensus as to the (degree of) importance of a landscape, for reasons including landscape quality, scenic (or visual) quality, wildness and tranquillity, natural and cultural heritage interests, cultural associations and recreational opportunities.

Amenity – The benefits afforded to people by a particular area in terms of what is seen and experienced. Amenity includes not just visual amenity and views but also the experience of landscape in its widest sense. Different groups of people such as walkers, residents and motorists may have different amenity expectations.

Landscape sensitivity to wind energy development is the extent to which a landscape is vulnerable to change as a result of wind energy development, due to potentially significant adverse impacts on its landscape resources (that is its fabric, character, quality, value or amenity). Sensitivity may be identified in relation to particular characteristics or features. For example, the wild character of a particular upland area may increase its sensitivity, but so too may the presence of specific natural or cultural heritage features that contribute to landscape character and enjoyment.

Landscape capacity for wind energy development is the extent to which a landscape can accommodate wind energy development without significant adverse impacts on its landscape resources (that is its fabric, character, quality, value or amenity). Capacity, like sensitivity, reflects the particular landscape characteristics and features of a given area. For example a degraded habitat character, or the presence of existing large scale infrastructure, may suggest that there is capacity for wind energy development.

Importantly, sensitivity and capacity depend on both character and on the degree to which society values a particular place. A landscape that is highly valued and designated as such may nonetheless be able to accommodate wind energy development in the right location, if there is a good fit with character and the special qualities and features of the place can be conserved. Conversely, a landscape that has not been designated may still be highly sensitive to wind energy development, for example due to its particular visual prominence or its role as a recreational resource.

[6] Definitions in *Tables 1* and *2* are taken from (or closely based upon) the most recent relevant guidance from the sources listed in the introduction to this section.

Additional terms relating to landscape and visual impact assessment are presented in *Table 2*.

Table 2: Key Terms Relating to Landscape and Visual Impact Assessment

Landscape impacts – Changes in the physical landscape that give rise to changes in its character and how it is experienced, and may in turn affect the value attached to a landscape. Landscape impacts may be beneficial (for example where a characteristic feature is restored) or adverse (for example where a characteristic feature is damaged or lost).

Visual impacts – Changes in the appearance or perceptions of a particular area or view as a result of development or other change. Visual impacts can be beneficial (for example where a new view is opened up) or adverse (for example where an existing view is affected by the addition of an intrusive feature).

Cumulative impacts – The combined impacts that occur, or may occur, as a result of more than one project being constructed, giving rise to accumulating landscape and visual changes where developments are seen simultaneously (at the same place, in the same field of view), in succession (at the same time, but not in the same field of view) or in sequence (on travelling through an area).

Landscape sensitivity – A term based on the inherent sensitivity to change of a landscape in both landscape character and visual terms (as a result of its type of character, visibility etc). In Environmental Impact Assessment the term sensitivity may also be used to encompass the value placed upon the landscape.

Visual sensitivity – The sensitivity of visual receptors (viewers and views) to changes in the appearance of the landscape. Sensitivity depends on the location and context of the viewpoint, the expectations and occupation or activity of the viewer, and the importance or value of the view.

Landscape capacity – A term used to indicate – generally for the purposes of planning policy or guidance – the extent to which a landscape can accommodate specific types of change or development. Capacity assessment should identify key aspects of the specific change or development that are likely to have an impact on the landscape.

Magnitude – A combination of the scale, extent and duration of an effect. The nature and degree of change to the landscape resource, the scale of the change in view resulting from the loss or addition of features, the degree of contrast or integration of new features in the landscape, the angle and distance of view, the extent of the area over which the changes would be visible, and the duration of the effects are all relevant considerations.

Impact significance – A term that is not absolute and can only be defined in relation to each development and its location. The two principal criteria determining significance are the sensitivity of the landscape or viewer and the magnitude of the effect.

2.3 Sensitivity Assessment

The first step in the assessment process is to assess the inherent sensitivity to wind energy development of each landscape using the criteria listed below. The criteria are based on current good practice in assessment of landscape sensitivity and capacity for wind energy. They have been carefully worded for clarity, ease of interpretation and consistency with published guidance on landscape character assessment and landscape and visual impact assessment.

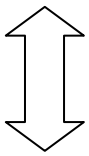
They include criteria based on landscape and visual character as well as others based on valued landscape qualities and features. However, references to value do not imply a blanket presumption against development. Instead the intention is to highlight specific aspects of the landscape that are valued and hence may be vulnerable to change associated with wind energy development.

Table 3: Criteria for Assessing Landscape Sensitivity to Wind Energy Development

Sensitivity Criterion	Explanation of Criterion
Scale	A large scale landscape, such as extensive rolling uplands or expansive plains, where the turbines may be in proportion with the landscape, is likely to be less sensitive to wind energy development than a small scale landscape where turbines may appear to dominate local landform and landcover elements. A large height differential between valley floors and summits may also help reduce sensitivity in upland landscapes by diminishing the perceived height of turbines.
Landform	Landform that is smooth, convex and flowing, or flat and uniform, is likely to be less sensitive to wind energy development than dramatic or rugged landform. This is because the former types of landform tend to be less prominent and less distinctive in character. Convex landform may in addition provide partial screening for turbine structures.
Landcover	Simple, regular, uncluttered landscapes with extensive areas of consistent ground cover are likely to be less sensitive to wind energy development than areas with more complex, irregular or intimate landscape patterns (for example ancient, irregular field systems). The latter areas tend to be more vulnerable to physical disturbance, which is likely to have greater effects on landscape fabric and landscape condition (for example affecting the integrity of landscape patterns). Intensive farming or commercial forestry may also reduce sensitivity.
Built environment	Landscapes already affected by contemporary built structures such as masts, pylons, chimneys, major transport infrastructure (or by influences such as quarrying or landfill) may be less sensitive to wind energy development, provided care is taken to avoid visual conflicts where any existing structures are seen in close proximity to turbines. Conversely areas with a more established, traditional or historic built character, are likely to be more sensitive.
Skylines and settings	Landscapes with prominent, undeveloped skylines are likely to be more sensitive to wind energy development than landscapes with skylines that are less prominent or that have already been affected by built development. The presence of distinctive landscape features, such as hilltop monuments, church spires or designed landscapes, may also heighten sensitivity where turbines would be seen in the same view and/or would adversely affect the setting of the feature concerned.
Visibility and views	Landscapes that are visually contained by topography, buildings, trees or woodlands and hence have limited inward and outward views may be less sensitive than areas with extensive inward and outward views. Such features may give screening for the lower parts of turbines and for associated

	access and infrastructure. However trees and woodlands should be a long term feature if their screening effects are to be relied upon. Extensive close or middle range views from scenic routes, well-known vistas or tourist viewpoints may increase a landscape's sensitivity to wind energy development, as may close proximity to settlement.
Landscape quality (condition)	Areas of countryside where the condition and integrity of landscape patterns, elements and features are relatively good may be more sensitive to wind energy development than areas where condition is relatively poor. In such areas the fabric and character of the landscape are likely to be more highly valued and also more vulnerable to physical damage as a result of wind energy development.
Scenic quality	Scenic quality, that is visual appeal due to important views, visual interest and variety, contrasting landscape patterns, or dramatic topography, may increase landscape sensitivity to wind energy development. Land of high scenic quality occurs within designated landscapes (World Heritage Sites, National Parks, Areas of Outstanding Natural Beauty and Heritage Coasts) but also elsewhere. For example, the approaches to and settings of designated landscapes may be sensitive where they share or contribute to the scenic quality of those landscapes.
Wildness and tranquillity	The presence of a relatively wild and/or tranquil character (due to remoteness, freedom from human activity and disturbance, and factors such as openness and perceived naturalness) tends to make the landscape more sensitive to wind farm development. The introduction of wind turbines may alter perceptions of wildness and tranquillity, introducing movement, sound and light effects and possibly bringing a more industrial character to the affected landscapes.
Natural and cultural heritage features	The presence of natural and cultural heritage features such as interesting and valued habitats, wildlife, geological, archaeological, historical or built environment features that enhance the landscape experience may increase sensitivity to wind farms, particularly where these features may directly affected by construction works and/or access tracks; or where enjoyment of these features may be diminished.
Cultural associations	Specific cultural (ie historical, folklore, literary or artistic) associations relating to the landscape may result in increased sensitivity to wind energy development if the character or perceptions of the landscape concerned are likely to be significantly altered.
Amenity and recreation	Areas offering access to high quality landscapes, memorable places, and special experiences and to a range of opportunities for open-air recreation may be more sensitive to wind energy development due to potential effects on accessibility and/or on the quality of the recreational experience that will be obtained. Sensitivity may be raised by proximity to important recreational features such as National Trails and other long distance routes.

For each landscape within the study area an assessment of sensitivity against each of these criteria is prepared. This is used to give an overall sensitivity level using a five point scale as shown below.

High sensitivity		Landscape is very vulnerable to change due to wind energy development. Wind energy development seems likely to result in significant adverse impacts on landscape resources. Wide areas are likely to be unsuitable for wind energy development.
Moderate- high sensitivity		Landscape is of intermediate vulnerability to change due to wind energy development. Wind energy development seems likely to result in locally significant adverse impacts on some landscape resources. Some specific areas are likely to be unsuitable for wind energy development.
Moderate sensitivity		
Moderate- low sensitivity		
Low sensitivity		Landscape is not very vulnerable to change due to wind energy development. Wind energy development seems unlikely to result in significant adverse impacts on landscape resources. Limited areas are likely to be unsuitable for wind energy development.

The overall sensitivity level is assessed by considering the combined weight of evidence on landscape sensitivity (rather than by scoring the landscape against each criterion and averaging the scores). This is because landscape and visual characteristics and values do not readily lend themselves to scoring and criteria may carry different weights in different types of landscape and with different types and scales of development. The sensitivity assessment provides the background information that is needed to inform the subsequent capacity assessment, which explores further the ability of a specific area to accommodate different turbine heights and groupings.

2.4 Capacity Assessment

Once the sensitivity assessment is complete, a capacity assessment is prepared. In assessing capacity, consideration is given to issues of wind farm ***fit*** with landscape character, as well as to any site-specific sensitivities or other constraints that may apply. Different areas of landscape may have fundamentally different abilities to accommodate wind energy development, reflecting the presence of different landscape characteristics and values.

In assessing capacity, consideration also needs to be given to the ***scale*** of wind energy development that may be accommodated. Clearly, landscape capacity for wind energy development is influenced by the extent and size of any development ie by both turbine groupings and turbine height in relation to the underlying landscape. To help describe capacity, it is helpful to use an explicit wind energy development typology. The typology used in this study is set out in *Table 4* (so for example when the capacity assessment refers to a medium wind farm with large turbines, it means a grouping of 6-10 turbines 90-130m in height to blade tip). *Figure 2* shows the comparative heights of the different turbine classes and other landscape features.

Figure 2: Comparative Turbine Heights

1:1250 @ A4

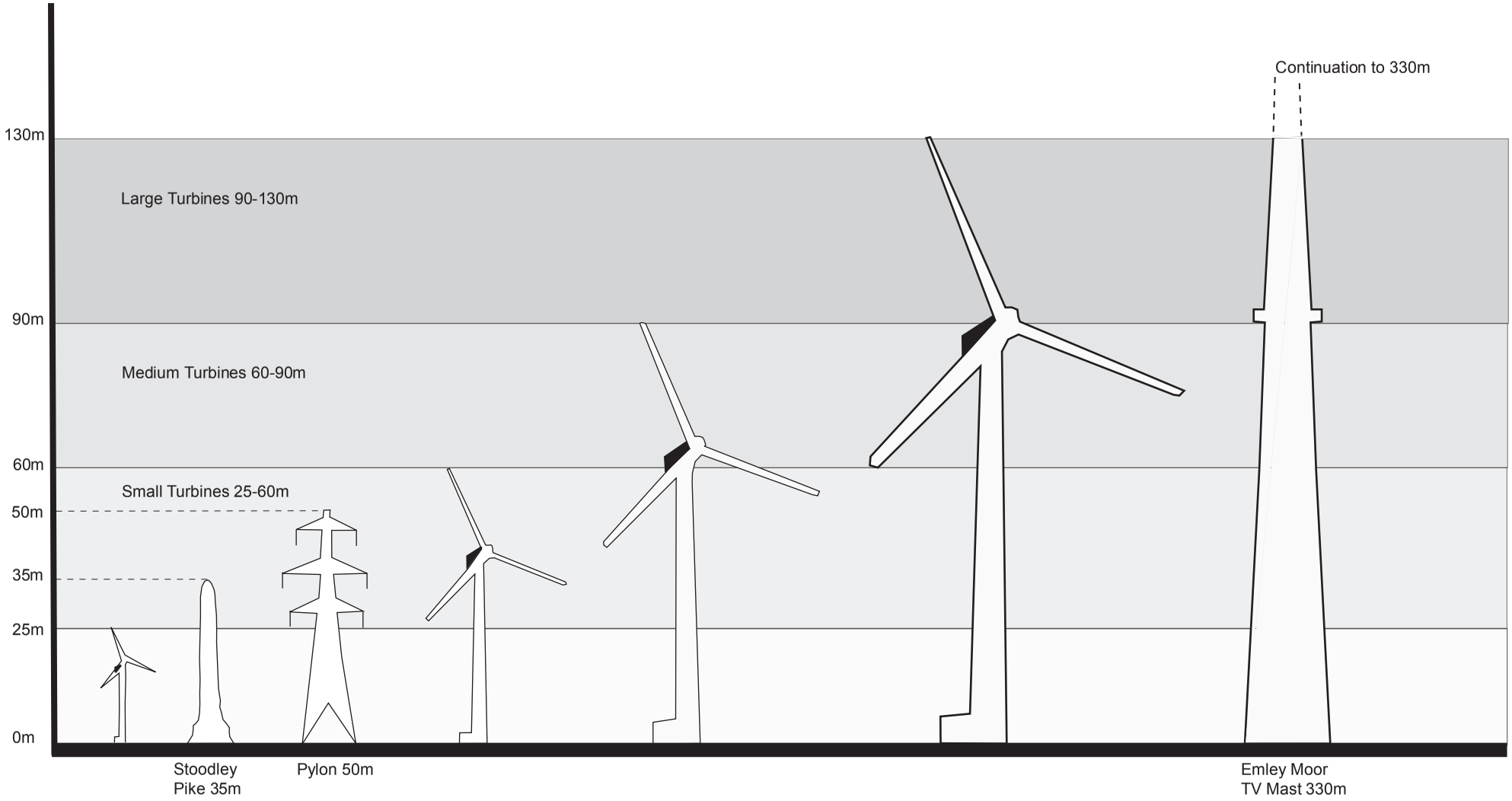


Table 4: Wind Energy Development Typology[7]

Turbine groupings
Single – 1 turbine
Small group – up to 3 turbines
Small wind farm – up to 5 turbines
Medium wind farm – 6 to 10 turbines
Large wind farm – 11 to 20 turbines
Very large wind farm – 21 to 30 turbines
Turbine height
Very small – 25m or less to blade tip (average power rating around 12kW)
Small – 25-60m to blade tip (average power rating around 0.5MW)
Medium – 60-90m to blade tip (average power rating around 1MW)
Large – 90-130m to blade tip (average power rating around 2.5MW)

Finally, the capacity assessment needs to consider the 'baseline' impacts of any existing wind energy developments in the vicinity and the ***cumulative impacts*** that might occur if further development were to take place. This requires information on operational and consented wind farms within the study area and a 30km radius beyond (see *Section 4*). This information is used to assess where and how existing wind energy development may affect the landscape's capacity to accommodate further wind energy development.

Taking all these factors into account, a written capacity assessment is then prepared that indicates in broad terms what type(s) of wind energy development can be accommodated, where, in a given assessment area. It summarises the location, context and intervisibility of each area before providing an assessment of capacity under the following headings:

- ***Constraints*** – The key landscape sensitivities that occur within the area and that need to be recognised and respected when siting wind energy development. These may include not only specific aspects of the area's landscape and visual character but also valued landscape qualities and features that might be adversely affected.
- ***Opportunities*** – The main areas of opportunity for wind energy development, taking account of landscape character and landscape values. Any broad areas of opportunity for wind energy development are described and advice is given on the size of turbine grouping(s) that might be accommodated where relevant.
- ***Guidance*** – Reasoned advice on more detailed issues of siting, layout and design, including consideration of turbine height in relation to the landscape and/or in relation to any existing wind energy development in the surrounding area.
- ***Cumulative and cross-district issues*** – Details of any existing developments in the vicinity and their effects on the capacity of the landscape to accommodate further wind energy development (NB this section will require regular updating).
- ***Overall capacity*** – The overall capacity of the area ie the maximum number of developments (including any existing developments) that can be accommodated without significant adverse impacts on landscape resources.

[7] Developments larger than 50MW will be determined by the new Infrastructure Planning Commission, not by the local planning authorities. In practice very large wind farms with large turbines are likely to fall into this category.

Hence the capacity assessment provides a reasoned appraisal and brief guidance on the general location, type and level of wind energy development that may be accommodated without significant adverse impacts on landscape resources. The general assumption is that change will be easiest to accommodate in areas of low sensitivity, and most difficult to accommodate in areas of high sensitivity. Areas of moderate sensitivity are generally taken to have capacity to accommodate some change. However it is also recognised that every specific case is different and that ultimately capacity will also be affected by other factors, including technical feasibility and perceptions of the need for development, which are not considered in this study.

In assessing overall capacity we have endeavoured to identify and refer to the key ***thresholds*** or 'tipping points' of landscape change that may occur as a result of wind energy development. The diagram below summarises these thresholds and shows how they may relate to the strategy for a given landscape. Thresholds vary from one landscape to another and are also dependent on the specific nature of the development proposals concerned. However, it can be seen that, in general, there is most likely to be significant capacity for wind energy development where landscape change (or indeed the creation of a new character) is considered acceptable. Conversely, where the strategy is one of conservation, capacity is likely to be limited.

Table 5: Thresholds of Landscape Change

Landscape strategy	▶ **Conservation**	▶ **Accommodation**	▶ **Change**	▶ **New character**
Wind energy development capacity	A 'landscape with no wind farms or infrequent wind farms'	A 'landscape with occasional wind farms'	A 'landscape with wind farms'	A 'wind farm landscape'

2.5 Principles Affecting Landscape Capacity for Wind Energy Development

As discussed above, in assessing landscape capacity for wind energy development, there is a need to consider issues of fit with landscape character, scale and cumulative impact. The tables below summarise some of the general principles that have been applied in this assessment. These are developed further in *Section 6*, which advises on good siting, layout and design in the South Pennines specifically.

Table 6: General Principles Relating to Fit with Landscape Character

Upland landscapes
• The broader the upland, the greater its capacity for wind energy development is likely to be. • Uplands with a simple, rounded and generally horizontal form may be able to accommodate larger turbine groupings than more dramatic or convoluted upland landforms. • In areas of more complex upland landform, smaller turbine groupings will generally fit better than larger groupings. • Development that is well set back from upland edges or scarps will be less prominent in the landscape than development close to the upland edge.

- The central part of an upland area will often be least visible from adjoining lowland landscapes. Convex landform in particular may offer some screening and reduce visible turbine heights, especially in short range views from valleys below.
- Siting of turbines on obvious summits or other prominent landforms should generally be avoided.
- Impacts can be reduced by selecting sites on less prominent side slopes, benches and gentle undulations as sites rather than tops themselves.
- Locations close to distinctive topographic features, field patterns, buildings or other features may bring undesirable scale comparisons.
- Wilder areas of upland, characterised by open heather moor and bog, are usually more sensitive than areas of grass moor or forestry which may have a more intensively managed character.
- Locations that can utilise existing roads or tracks for access are preferable to locations that require lengthy and often highly visible new access tracks.

Intermediate landscapes

- Such landscapes, typified by rolling ridge and drumlin landscapes, tend to suit smaller turbine groupings and turbine heights.
- Where the landscape is rolling or undulating, small turbine groups are likely to fit best in the landscape; where the landscape is flatter or more gently sloping, larger turbine groups may sometimes be accommodated.
- Where skylines are especially sensitive, it may be helpful to site turbines so that they are backclothed against hillsides beyond.
- Where sited on low ridges or hills, particular care should be given to turbine height in relation to landform.
- As rule of thumb, turbine heights should not exceed the average hill or drumlin height (note, height, not elevation AOD) and should ideally be no taller than half that height.

Lowland landscapes

- These landscapes, including valleys, floodplains and lowland farmlands, may accommodate larger turbines and turbine groupings than intermediate landscapes, provided that their character is simple and expansive.
- However capacity may be reduced by the presence of features such as prominent church spires that offer a scale comparison nearby.
- Valley landscapes that are enclosed by uplands with existing wind farm development should generally be kept free of wind turbines, to maintain a sense of contrast and ensure that the wider landscape does not become dominated by wind energy development.
- Floodplain landscapes, unless very extensive, may have little landscape capacity for wind turbines because openness is an essential part of their character.
- Extensive flat farmlands may be better able to accommodate wind energy development. Here regular rows or lines of turbines may provide the best fit with large, regular field patterns.

Urban and industrial landscapes

- These landscapes may have capacity for wind energy development due to the presence of existing man-made influences.
- For example sites close to power stations, factories, large institutions such as hospitals, business parks, major transport corridors and quarries may have capacity for wind turbines in landscape terms.
- Wind turbines should be carefully sited and designed relative to existing structures. Particular attention should be paid to relative heights and proportions; close visual relationships may help to reinforce functional relationships.
- In some cases turbines may be used to create a new focal point or landmark, drawing the eye upwards and away from existing intrusive features.
- However care should be taken to avoid creating visual clutter by placing turbines too close to other complex structures such as pylons or telecommunications masts.
- Functional relationships between domestic, community and industrial turbines and their landscape settings should be reflected in turbine siting, turbines being closely associated with, and in scale with, the farms, settlements or industrial plant that they serve.

Table 7: General Principles Relating to Scale and Cumulative Impact

Turbine groupings

- Landscapes with a simple, strong and mainly horizontal form are more likely to be able to accommodate large turbine groupings successfully.
- Small turbine groupings may however fit less well in these horizontal landscapes, because their height may appear disproportionate.
- Conversely, in landscapes with more complex and varied landform, large turbine groupings may have an undesirable 'flattening' effect on landscape character.
- Smaller turbine groupings are likely to fit better in these smaller scale, more intricate landscapes.
- Compact clusters of turbines may sometimes be used to create or highlight a focal point within the landscape, adding or reinforcing a vertical emphasis in the landscape.
- However such an approach needs to be used very selectively if it is to be effective in creating a visual focus.

Turbine height

- In general, turbine height should be proportionate to landform height, with taller turbines being used on higher hills and smaller turbines on lower ground. This will help to retain topographic distinctions and contrasts between upland and lowland landscapes.
- Hence elevated upland landscapes can often accommodate taller turbines than lowland landscapes, especially where the lowland landscapes have a rolling, varied topography whose subtle variations could be overwhelmed by tall turbines.
- However, extensive, flat, uniform lowland landscapes may also be able to accommodate tall turbines because of the lack of topographic distinctions and because the larger horizontal extent of such landscapes tends to diminish perceived turbine height.

Cumulative impacts and spacing between wind farms

- Satisfactory spacing depends both on landscape character and on the degree of intervisibility.
- Where several wind farms are visible together or sequentially they may cumulatively affect landscape character and visual amenity at a strategic level.
- Retention of areas of undeveloped landscape is important. For example, where a small lowland wind farm connects larger upland sites visually, wind farm influence on landscape character may become much more significant and dominant.
- Inconsistencies in turbine layout, height or design between adjacent wind farms can draw the eye and may cause increased landscape and visual impact.
- Appropriate spacing depends at least partly on landscape patterns and rhythms. Hence on an undulating upland ridge, wind farm spacing may reflect the pattern and frequency of undulations, whereas on a simple rounded upland ridge a cluster of wind farms may give a better landform fit.
- As a rule of thumb, separation distances ranging from 6km (for smaller sites in landscapes with some visual enclosure) to 12 km (for larger sites in open exposed landscapes) are desirable to prevent the landscape becoming dominated by wind farms and to reduce intervisibility.
- If small and medium sized wind farms are located less than 3-5km apart (to the outermost turbines) they may be seen as clusters and in areas of appropriate character may be accommodated as such within the landscape.

3 Assessment Process

3.1 Overview

This section briefly describes the main steps in the assessment process, explaining the information sources that were used, the desk and field survey work that was undertaken, and the outputs that were provided to the client authorities. The main steps were:

- Development of the assessment approach and principles;
- Review of existing wind energy development;
- Development of a spatial framework for the assessment;
- Background research;
- Preparation of working maps;
- Baseline assessment;
- Sensitivity and capacity assessment;
- Preparation of guidance on siting, layout and design;
- Preparation of outputs.

The study involved both desk and field work, with field survey work being undertaken in the early stages of the study (to familiarise the team with the landscapes of the study area and inform the development of the spatial framework) and again during the preparation of draft sensitivity and capacity assessments (to inform and verify the assessments). Field work was undertaken by two assessors (Julie Martin and Alison Farmer) providing the opportunity for peer review. All study outputs were also subject to peer review and checking.

3.2 Development of Assessment Approach and Principles

The assessment approach and principles, now set out in *Section 2*, were developed and were subject to review and feedback from members of the study Steering Group in the early stages of the study. Comments from the Steering Group on the sensitivity criteria, the wind energy development typology and the principles affecting landscape capacity for wind energy development were incorporated into the assessment approach and principles before they were finalised and applied.

3.3 Review of Existing Wind Energy Development

Information was compiled on operational and consented wind energy developments within the study area (ie the six district council areas) and a 30km radius around to permit assessment of baseline and cumulative impacts. Information was obtained initially from the British Wind Energy Association (BWEA) database, but was checked and confirmed with the relevant local planning authorities where necessary. Broader information was also gathered on wind speeds and on wind energy applications both past and present, to inform the team's understanding of likely future trends in wind energy development. Further details can be found in *Section 4*.

3.4 Development of Spatial Framework

An important early task was to develop appropriate spatial framework(s) for the baseline assessment and the sensitivity and capacity assessments. This involved familiarisation with the study area, research and discussion with the Steering Group. It was decided that the spatial framework for the baseline assessment should be Natural England's National Character Areas (NCAs). For the sensitivity assessments, the preferred spatial framework was local authority landscape character types (LCTs), based on the existing SCOSPA landscape character assessment typology[8], which covers the greater part of the study area and which, for the purposes of this study, was extended to cover the whole study area. For the capacity assessments, capacity areas (CAs) developed specifically for the purposes of this study were considered the best available spatial framework. Further details of these frameworks, the rationale behind their choice, and any limitations, are given in *Sections 4.5* and *5.1*.

3.5 Background Research

This involved review of all the existing landscape character assessments for the study area and adjoining districts (see *Annex 1*) and of the documentation listed in the brief. In addition the team examined other sources such as existing policy and guidance on wind energy development at district, regional and national level; Environmental Statements for existing wind energy developments in the study area; further information on natural and historic environment interests such as Natural Area profiles, SSSI citations and historic profiles; recent research by Natural England on deep peat resources in the North West; and studies of recreation and recreation management in the South Pennines, for example by Pennine Prospects. A full bibliography is presented in *Annex 3*.

3.6 Preparation of Working Maps

1:50,000 scale working maps were compiled for use in the study. These provided basic information on the spatial frameworks described above, the location of wind energy developments, and wind speeds. In addition the working maps provided consistent reference information on landscape characteristics and values across the study area, as listed in the table below. Information was obtained from national data sources, from Natural England and from local planning authorities, and was generally restricted to datasets that were available for the whole study area rather than for specific local planning authority areas only.

Table 8: List of Working Maps

Maps of 'landscape characteristics' (data obtained from Natural England) • 50m contour and hillshade analysis • Field parcel size analysis from Rural Land Register • Land cover from Land Cover Map 2000 • Tranquillity and infrastructure (CPRE tranquillity mapping, brownfield land, major road/rail corridors, transmission lines)

[8] Land Use Consultants (1999) *South Pennines Landscape Character Assessment*, report to Standing Conference of South Pennine Authorities (SCOSPA).

Maps of 'landscape values' (data obtained from national sources, Natural England (NE) and local planning authorities)

- Landscape designations - National Parks and AONBs in wider area, plus South Pennines Heritage Area, West Pennine Moors and other local landscape designations where applicable
- Natural heritage interests - SSSIs, SACs, SPAs, important bird areas (NE), ancient woodland (NE), deep peat (NE)
- Cultural heritage interests - Scheduled Monuments, Registered Parks and Gardens, Registered Battlefields, Conservation Areas
- Recreational interests - National Trails, other long distance paths, Country Parks

1:25,000 base mapping was also used throughout the study, providing further useful background information, for example on field patterns, access land and local walking routes. Aerial photos[9] were an invaluable additional reference source.

3.7 Baseline Assessment

The next step in the study was to prepare the baseline assessment. This provided the opportunity to review the distinctive characteristics and values associated with the South Pennines landscape at a strategic scale and to consider the impacts of existing wind energy developments. The findings of the baseline assessment, which are presented in *Section 4*, include an overview of the landscape character of each of the NCAs that lies wholly or partly within the study area, a description of its wind energy development status, commentary on the broad impacts of any existing wind energy development on the landscape of the study area, and comments on existing and potential issues of cumulative impact. The baseline assessment was initially produced as a desk exercise but was refined and developed further following field survey work. It also drew upon zone of theoretical visibility mapping for existing wind energy development sites (normally available as part of the Environmental Statement).

3.8 Sensitivity and Capacity Assessment

The main bulk of the work on this study comprised the preparation of the sensitivity and capacity assessment sheets, presented in *Section 5*. The assessment sheets were developed at an early stage in the project and were initially piloted, as a desk exercise, in two LCTs and two CAs. These pilots were reviewed by the study Steering Group, whose comments on content and structure were taken on board before the assessment was rolled out across the whole study area.

All the assessment sheets were prepared in rough draft prior to field work. This required very careful review and consideration of landscape characteristics, key environmental features, and landscape values. Both published sources (mainly existing landscape character assessments) and mapping fed into this process; as indicated above, aerial photography was also invaluable. Existing wind energy sensitivity and capacity assessment work was also consulted where available[10].

[9] http://www.flashearth.com/

[10] Lovejoy (2005) *Landscape Sensitivity to Wind Energy Development in Lancashire*, report to Lancashire County Council and others; Land Use Consultants (2009) *Landscape Sensitivity Assessment for Renewables in the Peak Sub-Region*, report to the Peak District National Park Authority and others.

For each LCT, the landscape was reviewed during desk study against the landscape sensitivity criteria. An overall assessment of sensitivity was prepared, highlighting any spatial variations in sensitivity across the LCT. The subsequent field work then allowed refinement of the sensitivity assessments. In particular it helped the team to understand issues relating to built environment, skylines and settings, visibility and views, landscape quality (condition) and scenic quality, and to understand how the landscape is experienced both from key viewpoints and by people travelling through the area. The sensitivity levels assigned to each of the LCTs and the broad patterns that emerged were reviewed for consistency.

For each CA, the relevant sensitivity assessments for constituent LCTs were used to draft initial comments on possible capacity for wind energy development. As well as considering context, intervisibility, and likely key constraints, consideration was given to potential areas of opportunity within the landscape. The working maps were scrutinised for land that might afford a good fit with character (eg areas of simple domed landform) as well as areas that are relatively unconstrained by the presence of special landscape values. The field survey then allowed the team to assess these broad areas in more detail, exploring the likely implications of different types of wind energy development in that general location. Issues of scale (ie possible turbine groupings and heights), design, cumulative impacts, and overall capacity were all considered. Following the field survey the full capacity assessment sheets were prepared.

3.9 Preparation of Guidance

Having completed this work, guidance was prepared on how to use the assessments sheets and on how to take landscape and visual issues into account in initial scheme planning; in siting, layout and design; and in the review of wind energy development proposals. The findings of this work, presented in *Section 6*, reflect the specific character and qualities of the South Pennines landscape, and highlight some of the key landscape and visual issues that apply in this area.

3.10 Outputs

The study outputs include this report and associated mapping, GIS and database material. Both the presentation maps included in this report and the working maps detailed in *Table 8* were supplied as pdfs to the client authorities. In addition, the spatial frameworks shown in *Figures 7-10* were supplied as MapInfo GIS files with associated databases of textual information drawn from the sensitivity and capacity assessment sheets, for ease of reference by individual districts. This should also facilitate updating of the assessment in future to take account of changing cumulative impacts over time.

4 Baseline Assessment

4.1 Introduction

This section introduces the South Pennines landscape; reviews the distribution of existing wind energy developments; and considers, at a strategic level, their effects on landscape and visual resources, highlighting issues of cumulative impact that may need to be taken into account as wind energy development in the South Pennines and surrounding areas expands. Some consideration is also given to the potential effects of applications that are currently in the pipeline. The baseline assessment has informed the more detailed landscape sensitivity and capacity assessment work that has been undertaken.

4.2 The South Pennines Landscape

4.2.1 Landscape and Visual Character

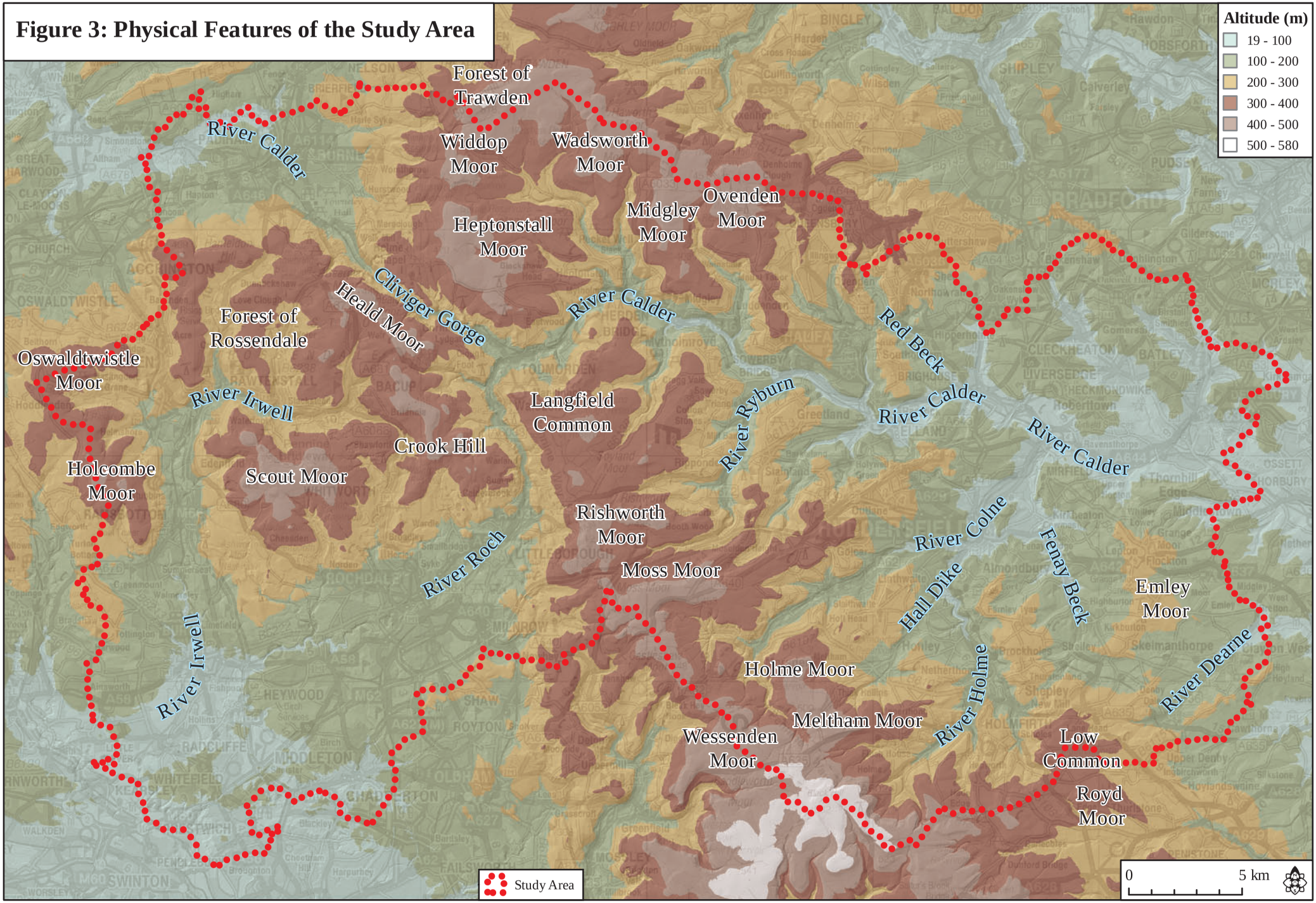
Figure 3 shows the principal physical features of the study area. The landscape of the South Pennines as a whole is characterised by wide open moorland plateaux with sharp gritstone edges and tors, deeply trenched by narrow valleys and wooded cloughs. There is a mosaic of moorland and blanket bog with enclosed walled pastures on broad terraces at lower elevations around the fringes of the moors. Reservoirs are common throughout the area. The valley bottoms are densely settled, with gritstone towns centred around key features of industrial heritage such as textile mills. Stone buildings extend along the valley sides, with older vernacular settlements and some coalfield settlements (particularly in the east of the area) on the moorland fringes above. Historic packhorse trails traverse the exposed moorland tops and in parts the landscape is affected by wind farm development, overhead power lines and quarrying, mainly on the fringes of the area.

There are extensive views from elevated locations in all directions. The open and broadly level plateau tops provide uninterrupted visibility over long distances, with wide horizons, big skies and a strong sense of relative isolation and remoteness. The plateau tops are characteristically open and largely undeveloped, although there are a number of important landmarks, including the monuments of Peel Tower (39m) above Ramsbottom in the west, Stoodley Pike (35m) on the south side of the Calder valley near Todmorden, as well as Emley Moor Tower (330m) east of Huddersfield.

Perhaps the most dramatic and striking views are from the sharp gritstone plateau edges where the contrast with the adjoining, intimate valley landscapes can be most clearly seen. This type of landscape and visual experience is most characteristic of the central part of the study area, which forms the Pennine watershed and has been most deeply incised. Here the Pennine Way and Pennine Bridleway National Trails run north-south across the study area and there are many other long distance paths.

In contrast, the incised valleys themselves have a more settled character and are often strongly influenced by large industrial structures such as textile mills and chimneys. Above the valleys, the sharp plateau edges form short-range skylines that tightly

Figure 3: Physical Features of the Study Area



Extensive views from elevated locations, including Pennine Way and Bridleway.

Sharp gritstone edges, tors and field enclosures.

Landmark hilltop monuments such as Peel Tower on Holcombe Moor.

Strong contrasts between the open moors and the industrial heritage of the valleys.

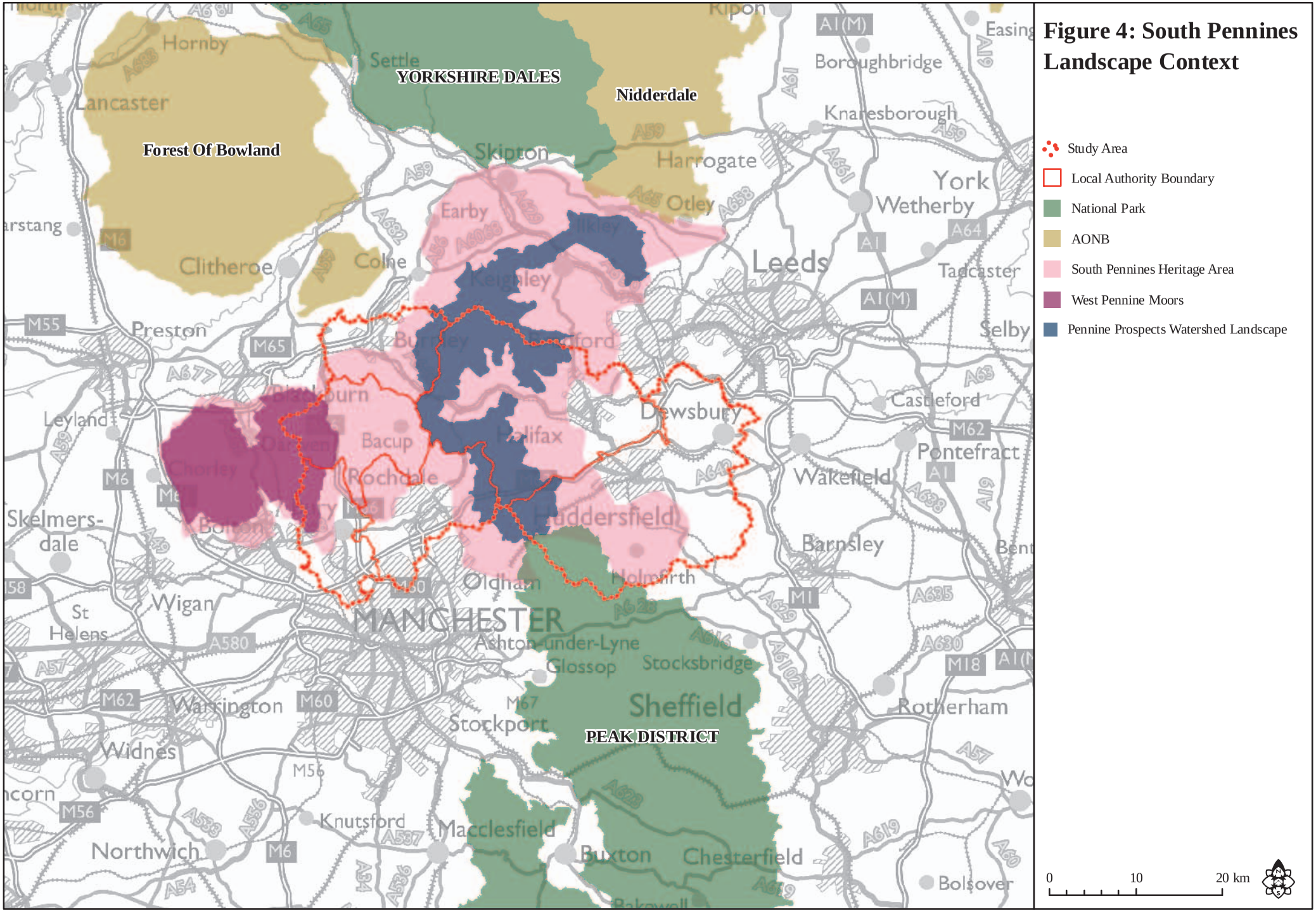


Figure 4: South Pennines Landscape Context

frame the settlements below, forming distinctive scarps that lend physical and visual enclosure, are the focus of many distinctive and dramatic views, and bring a sense of open countryside close to the heart of the built up areas and their urban populations.

These complex patterns mean that the landscape of the South Pennines is viewed and perceived in diverse ways by different groups of viewers. It is seen from surrounding urban areas as a distant countryside backdrop; from the trans-Pennine M62 as an apparently vast expanse of semi-natural moorland; from the area's many recreational routes as scenic, relatively wild and easily accessible countryside; and from the settled valleys of Rossendale, Calderdale and Kirklees as an immediate landscape setting. These differing experiences and perceptions need to be taken into account when assessing the landscape's sensitivity to and capacity for wind energy development.

4.2.2 Landscape Designations

The South Pennines is the only upland landscape in England that is not statutorily designated. Forming the central part of the Pennine 'spine' which runs up the middle of northern England, it separates the three major industrial conurbations of Greater Manchester and East Lancashire to the west and West Yorkshire to the east. At the same time it provides the physical link between landscapes that are statutorily designated, to north and south, namely the Yorkshire Dales National Park and the Nidderdale and Forest of Bowland Areas of Outstanding Natural Beauty close to the north, and the Peak District National Park to the south, a small part of which lies within the study area. This regional landscape context can be seen in *Figure 4*.

Despite its lack of statutory designation, the natural beauty of the South Pennines landscape has long been recognised. The main upland spine was identified in 1947 by the National Parks Committee, chaired by Sir Arthur Hobhouse, as a Conservation Area, that is a potential Area of Outstanding Natural Beauty (AONB). In selecting the South Pennines as a potential AONB, it seems that the Committee not only sought to highlight the area's great natural beauty, but also aimed to connect the National Parks to north and south and make recreational provision for the urban populations adjoining the South Pennines, in recognition of the strategic planning and recreational role of this area of countryside, as well as its natural beauty.

Ultimately, the South Pennines was not designated as an AONB, but the landscape importance of the area has continued to be acknowledged in other ways. It remains a highly valued landscape resource, important scenically as an upland link between the Peak District and Yorkshire Dales National Parks, and recreationally for the countryside experience that it offers to the large nearby urban populations of West Yorkshire, Greater Manchester and south Lancashire. It is also nationally and internationally important for its habitats (including extensive peat moorland and blanket bog designated as SSSI, SAC and SPA) and its historical and cultural influence as the seat of the industrial revolution.

These interests have been recognised in the non-statutory designation of the South Pennines Heritage Area and the West Pennine Moors (see *Figure 4*). The South Pennines Heritage Area, which covers large parts of the study area, was designated by the Standing Conference of South Pennines Authorities (SCOSPA) (now Pennine Prospects); while the West Pennine Moors, which lies on the western edge of and

largely outside the study area, was designated by the West Pennine Moors Partnership. Both designations were made in the 1990s and were supported by the Countryside Commission, English Heritage, English Nature and the Department of Natural Heritage.

Recently the central part of the study area, the so-called 'Watershed Landscape' (see *Figure 4*) has received further recognition, in the form of £2 million of Heritage Lottery funding for Pennine Prospects. This is intended to raise the profile of the area and the public's appreciation and enjoyment of its value and qualities, through a series of programmes focused on: access to the watershed landscape; the history and geology of the moorlands; enhancement of characteristic habitats; the moorlands as inspiration; understanding and enjoying the landscape; and training in aspects of countryside management. This narrow band of landscape, which includes the ridge between Crook Hill and Heald Moor, is especially important to the continuity of the Pennine backbone, as well as for the upland experience that it offers in a compact area between major conurbations.

4.2.3 Landscape Values

The *Landscape Character Assessment Guidance for England and Scotland*[11] identifies a number of criteria or reasons why stakeholders may attach value or importance to different landscapes. Briefly, these include landscape quality (the condition and intactness of a landscape and its features); scenic quality (visual appeal); rarity (the presence of rare landscape types or features); conservation interests (the presence of features of particular wildlife, earth science, archaeological, historical or cultural interest); wildness (the presence of wild or relatively wild character in the landscape); associations (with particular people, artists, writers or events in history); tranquillity (reflecting perceived links to nature and natural features and relative lack of detractors such as built development, traffic and noise); and recreational opportunities (for enjoyment of the landscape).

The landscapes of the South Pennines, despite their lack of statutory designation, rate highly against most if not all of these criteria. Among the 'special qualities' or values that can be ascribed to the landscape are:

- the distinctive and recognisable moorland plateau landform, which is a dramatic physical feature created by hard Millstone Grit;
- the rich variety and diversity of landscape types, including many rural landscapes that are relatively intact and unspoilt given their location sandwiched between three urban conurbations;
- the very close juxtaposition of industrial and dramatic 'wild' landscapes, which together create a harsh, wild beauty and strong visual contrasts;
- the area's unique cultural heritage, which includes a fascinating mix of industrial and prehistoric landscapes;
- the important semi-natural habitats, including moorland, in-bye land, remnant ancient woodland, and waterbodies and wetlands;

[11] Countryside Agency and Scottish Natural Heritage (2002) *Landscape Character Assessment Guidance for England and Scotland*, Countryside Agency and Scottish Natural Heritage.

- the isolation, remoteness and relatively wild character of the moorland summits and cloughs – qualities that are increasingly rare, especially close to large urban populations;
- the important cultural associations with, among others, the Brontës, who lived at Haworth north of Hebden Bridge; the former poet laureate, Ted Hughes, whose work was inspired by his early years at Mytholmroyd in the Calder Valley; and the access movement of the 1930s;
- the relative tranquillity of the moorland plateaux landscapes in particular, which offer a chance to 'get away from it all';
- the access and recreation opportunities offered by the area's vast tracts of urban common and other open access land;
- the extensive networks of public paths, including the Pennine Way and Pennine Bridleway, which are of national importance, having been funded by central government through Natural England.

In making decisions on future wind energy development, it is critical that wind energy developers as well as the local planning authorities and the new Infrastructure Planning Commission should recognise and respect the distinctive character, importance and values attached to the South Pennines landscape. These factors should be given due consideration and appropriate weight in the planning balance when determining applications for new wind energy development.

Given that the area straddles Lancashire, Greater Manchester and West Yorkshire as well as two government regions, it is also vital that decisions on specific wind energy applications should be taken in a holistic manner, acknowledging the effects on the wider landscape of the South Pennines (and beyond) as well as on the local area. A key purpose of this study is to help promote a common understanding of and approach to wind energy development in the landscape across the South Pennines.

4.3 Wind Energy Development in the Landscape

The South Pennines has a good wind energy resource. *Figure 5* shows the sub-region's wind energy resource in terms of mean wind speeds at 45m above ground level. This information, while not used directly in this study, nonetheless indicates the broad distribution of wind energy resources. The areas most likely to be subject to commercial wind energy development, in the short to medium term at least, are those with wind speeds exceeding 6m/s. It can be seen that those areas are located mainly in the upland landscapes of the sub-region.

Not only is there a growing number of existing and proposed wind farms, but the size of the turbines proposed has steadily increased in recent years and some existing sites are likely to be repowered with larger turbines in the near future. Hence issues of cumulative impact are coming increasingly to the fore. The open, exposed character and wide intervisibility of the moorland plateaux and their close juxtaposition with the densely settled valleys below mean that there are often especially complex issues to be addressed when siting wind energy development here.

There are also specific issues of concern to those living in and visiting the area. One of these relates to the perception that large scale wind farms may 'industrialise' the open moorland plateaux, which historically have always been open and relatively unaffected by industrial development, in contrast with the valleys below. Even in the areas where existing industrial features occur, the imposing vertical form and height of wind turbines are new and starkly different in character to existing industrial features, which often have strong historic associations. Another concern is that the relative wildness and tranquillity of the moors, which can be enjoyed from the dense network of public rights of way (including the Pennine Way and Pennine Bridleway National Trails), will be eroded by close range views of many wind farm sites. A third area of concern is that associated infrastructure, including monitoring masts, access tracks, substations and grid connections will seriously damage the landscape fabric (including the important deep peat resource) and create visual clutter.

4.4 Wind Energy Development Baseline

Figure 6 and the accompanying keys show the location of operational and consented wind energy developments and applications both within the study area and within a 30km radius of the study area. Data were compiled in October 2009 and came principally from the British Wind Energy Association (BWEA) database[12]. This is the best available national data source, but it is not necessarily complete and up to date, especially in relation to single turbines and small turbines. Hence data (for the study area only) were checked and verified as far as possible against local authority records and during site work. As a result, a number of single/small turbine developments were added to the list, together with larger development proposals that had been publicly announced although applications were still awaited. Only turbines 25m or more high to blade tip were included as there was no easy access to comprehensive data on smaller turbines and in general it is larger turbines that are more significant in terms of landscape and visual impacts.

It can be seen from *Figure 6* that as at October 2009, operational wind energy development was concentrated in the north-western part of the study area, at Ovenden Moor north of Halifax, Coal Clough and Hameldon Hill south-east and south-west of Burnley respectively and Scout Moor north of Bury and Rochdale. Two further developments in the same broad area are soon to be added, namely the consented Crook Hill and Reaps Moss wind farms north of Rochdale and east of Bacup respectively.

Just outside the study area, in its south-east corner, is a second cluster of wind energy development, where the operational Royd Moor wind farm is soon to be joined by further development at the consented Hazelhead and Blackstone Edge (Barnsley) sites. There is also a single operational turbine within the study area here, near Holmfirth.

Other operational and consented wind energy developments within or close to the study area are generally very small. Beyond the study area, all other operational or consented sites (Chelker Reservoir, Knabs Ridge and Marr) are more than 15km away and hence are likely to have only limited impacts on the study area.

[12] http://www.bwea.com/ukwed/index.asp

Figure 5: Mean Wind Speeds at 45m Above Ground Level

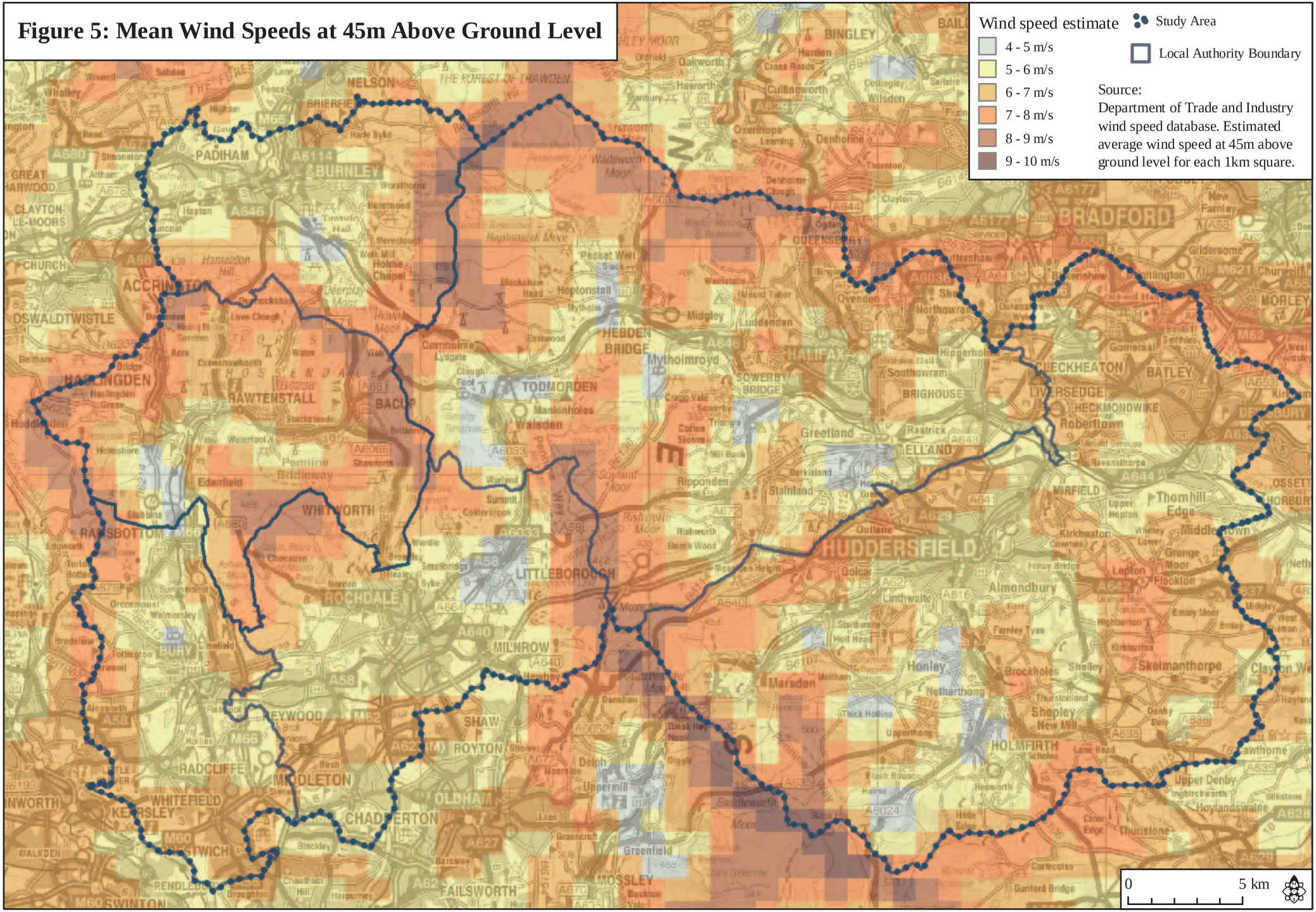
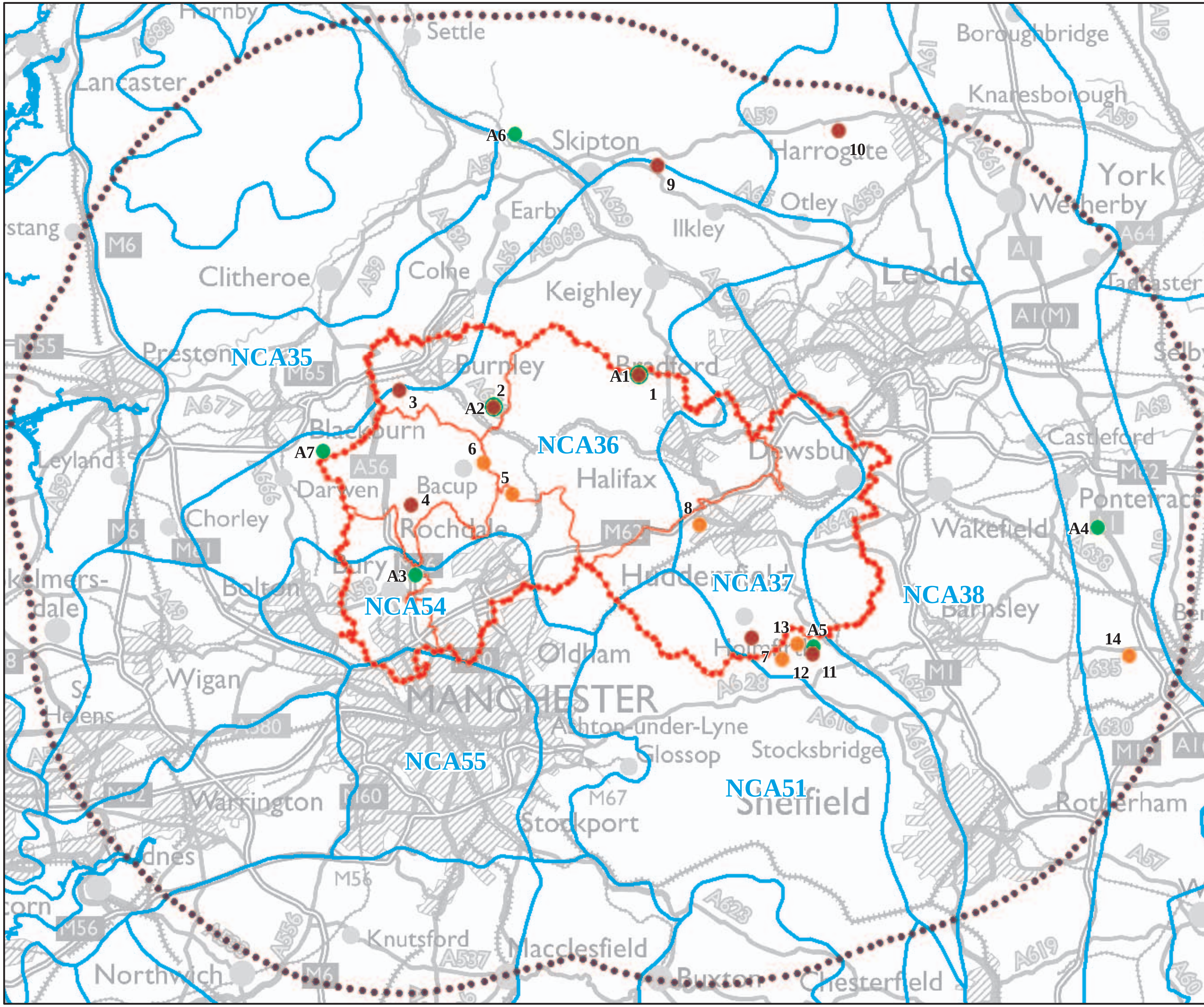


Figure 6:
Wind Energy Developments (as at October 2009) and National Character Areas



- 30km Buffer
- Operational Wind Development
- Consented Wind Development
- Proposed Wind Development
- Study Area
- Local Authority Boundary
- National Character Area

National Character Areas

35	Lancashire Valleys
36	Southern Pennines
37	Yorkshire Southern Pennine Fringe
38	Nottinghamshire, Derbyshire and Yorkshire Coalfield
51	Dark Peak
54	Manchester Pennine Fringe
55	Manchester Conurbation

0 5 10 15 km

Key to Operational and Consented Wind Energy Developments (as at October 2009)

Site No	Site Name	Status	Authority (ies)	NCA	Number of Turbines	Blade Tip Height of Turbines
Within Study Area						
1	Ovenden Moor	O	Calderdale	36 Southern Pennines	23	49m
2	Coal Clough	O	Burnley	36 Southern Pennines	24	49m
3	Hamdeldon Hill	O	Burnley	36 Southern Pennines	3	90m
4	Scout Moor	O	Rossendale, Rochdale	36 Southern Pennines	26	100m
5	Crook Hill*	C	Rochdale, Calderdale	36 Southern Pennines	12	120m
6	Reaps Moss*	C	Rossendale, Calderdale	36 Southern Pennines	3	120m
7	Dunford Road, Holmfirth (identified in field)	O	Kirklees	37 Yorkshire Southern Pennine Fringe	1	Est 40m
8	Scapegoat Hill, Huddersfield (identified from local authority records)	C	Kirklees	37 Yorkshire Southern Pennine Fringe	2	25m
Within 30km Radius of Study Area						
9	Chelker Reservoir	O	Harrogate	36 Southern Pennines	4	45m
10	Knabs Ridge	O	Harrogate	22 Pennine Dales Fringe	8	93m
11	Royd Moor	O	Barnsley	37 Yorkshire Southern Pennine Fringe	13	54m
12	Hazelhead	C	Barnsley	37 Yorkshire Southern Pennine Fringe	3	100m
13	Blackstone Edge (Barnsley)	C	Barnsley	37 Yorkshire Southern Pennine Fringe	3	101m
14	Marr	C	Doncaster	30 Southern Magnesian Limestone	4	125m

NB No sites are currently under construction either within the study area or within a 30km radius

Key to Applications and Expected (E) Applications for Wind Energy Development

Site No	Site Name	Authority (ies)	NCA	Number of Turbines	Blade Tip Height of Turbines
Within Study Area					
A1	Ovenden Moor Repowering	Calderdale	36 Southern Pennines	10	115m
A2	Coal Clough Repowering (E)	Burnley	36 Southern Pennines	10	110m
A3	Sillinghurst Farm, Bury (identified from local authority records)	Bury	54 Manchester Pennine Fringe	1	Est 40m
Within 30km Radius of Study Area					
A4	Westfield Lane	Wakefield	30 Southern Magnesian Limestone	6	125m
A5	Spicer Hill	Barnsley	37 Yorkshire Southern Pennine Fringe	5	84m
A6	Brightenber Hill	Craven	21 Yorkshire Dales	5	101m
A7	Hyndburn (E)	Hyndburn	36 Southern Pennines	12	122m

* Subject to approval under the Commons Act.

However there are a number of applications or expected applications that may affect the landscape of the study area in future, notably repowering applications for Ovenden Moor and Coal Clough; and newly proposed wind farms at Hyndburn (just west of Haslingden) and Spicer Hill (near the existing cluster of wind farms at Royd Moor). These applications, if consented, would broadly reinforce the existing patterns whereby major wind energy development is concentrated towards the north-west and south-east of the study area.

Finally it is interesting to note that there have been a number of other major wind energy applications within and around the study area in recent years. These include applications at Todmorden Moor east of Bacup (recently dismissed at appeal); Denshaw (just outside the study area, withdrawn); and also in Pendle District to the north (several applications, refused). It is possible that revised proposals will emerge for these sites although no applications have been submitted at the time of writing (January 2010).

4.5 Baseline Assessment of Landscape and Visual Impacts

4.5.1 Spatial Framework

The spatial framework for the baseline assessment was Natural England's National Character Areas (NCAs)[13], as shown on *Figure 6*. This broad landscape classification was considered appropriate as an introduction to the landscapes of the study area, and as a framework within which to consider the 'baseline' impacts of existing wind energy development. However it was recognised that this is a generalised national landscape classification; at a more detailed level the boundaries of the NCAs do not necessarily correspond with landscape units shown in regional and local authority landscape character assessments.

The baseline assessment takes account of operational and consented wind energy developments, including those within a distance of around 30km, as within this distance a wind energy development (if visible) may contribute to cumulative landscape and visual impacts. The key landscape and visual issues associated with operational and consented developments are highlighted. The possible impacts of further development in areas with known application sites are also discussed, but this is done separately as these are more speculative.

There are seven NCAs that lie partly inside the study area, namely:

NCA 35 Lancashire Valleys
NCA 36 Southern Pennines
NCA 37 Yorkshire Southern Pennine Fringe
NCA 38 Nottinghamshire, Derbyshire and Yorkshire Coalfield
NCA 51 Dark Peak
NCA 54 Manchester Pennine Fringe
NCA 55 Manchester Conurbation.

[13] http://www.naturalengland.org.uk/ourwork/landscape/englands/character/areas/default.aspx

4.5.2 Scope of the Assessment

The baseline assessment, presented in below in tabular form for each NCA, provides an overview of:

- Key characteristics of the NCA (note that these relate to the NCA as a whole and may include some characteristics that are not present within the study area);
- The number, scale and location of operational and consented wind energy developments that already affect (or will affect, when built) the part of the NCA landscape that lies within the study area[14];
- Further applications that might affect the landscape in future if they were consented;
- Any existing and potential impacts and cumulative impacts, including issues of: separation distances and cluster sizes; compatibility of turbine size and design; intervisibility and potential for simultaneous, successive or sequential views; impacts on landscape character; impacts on landscape fabric; impacts on skylines, settings and key views; impacts on designated landscapes; and impacts on landscape values including wildness, tranquillity, natural and cultural heritage, cultural associations and amenity and recreation.

4.5.3 NCA 35 Lancashire Valleys

Key characteristics

- The broad valley of the River Calder and its tributaries running north-east/south-west between natural backdrops of Pendle Hill and the Southern Pennines.
- Intensely urban character derived from main towns of Blackburn, Accrington and Burnley which have developed rapidly since the industrial revolution.
- A strong industrial heritage associated with cotton weaving and textile industries producing under-utilised mill buildings, mill lodges and ponds.
- Profusion of communication routes along the valley bottom including the Leeds and Liverpool Canal, the Preston-Colne rail link and M65 motorway.
- Victorian stone buildings well integrated into the landscape.
- Numerous large country houses with associated parklands particularly on northern valley side away from major urban areas.
- Remnants of agricultural land fragmented by industry and scattered development.
- Field boundaries, regular to the west, irregular to the east, and degraded round the urban areas, formed of hedges with few hedgerow trees and, at higher elevations, by stone walls and post and wire fences.
- Small woodlands are limited to cloughs on valley sides.

Wind energy development status

There is no operational, consented or proposed wind energy development in the part of this NCA that lies within the study area or indeed in any part of the NCA.

[14] This includes both developments within the study area and those in surrounding areas where visible. Visibility was assessed by examining zone of theoretical visibility (ZTV) maps for most of the key development sites, as provided in the Crook Hill wind farm Environmental Statement.

However the part of the NCA that lies within the study area is affected by wind energy developments in adjoining NCAs, notably those in the Southern Pennines NCA at Hameldon Hill (3 turbines 90m high) immediately to the south; Scout Moor (26 turbines 100m high) around 11km to the south; and Coal Clough (24 turbines 49m high) around 4km to the south-east. In future, the area may also be affected by the expected wind farm application at Hyndburn (12 turbines 122m high) around 6km to the south-west and by repowering at Coal Clough.

Baseline assessment

This NCA has no existing wind energy development, but its wider landscape context is affected by several wind farm sites (a total of 56 operational and consented turbines) to the south and south-east in the Southern Pennines NCA. These sites occupy a field of view of less than 90˚ when seen from within the NCA at present. There are no issues of compatibility of turbine size and design because turbines of different sizes are generally not seen together.

At present wind energy development has little direct effect on the landscape character and landscape fabric of this NCA. However it does influence the southern setting of the NCA and approaches to the NCA from the south and south-east. Skylines are not significantly affected at present as nearby wind energy development is either relatively distant or (in the case of Hameldon Hill) sited on valley side slopes so that turbines generally do not break the skyline when viewed from the north.

If further development were to take place at Hyndburn, this would increase the field of view occupied by wind farms and hence further affect the southern setting of and approaches to the NCA.

Cumulative issues that need careful consideration in this part of the Lancashire Valleys NCA are:

- The possibility that wind farms might come to dominate the southern and eastern settings of and approaches to the NCA;
- Potential impacts on the southern and eastern skylines of the NCA, which are an important element of views not only from the Burnley area, but also from Pendle Hill and other parts of the Forest of Bowland AONB to the north.

4.5.4 NCA 36 Southern Pennines

Key characteristics

- Large scale sweeping landform with an open character created by exposed gritstone moors at an altitude of 400-450m, deeply trenched by narrow valleys and wooded cloughs.
- Mosaic of mixed moorland and blanket bog with enclosed pasture of varying qualities at lower elevations, largely defined by drystone walls.
- Valuable wildlife habitats on the open moorland and the moorland fringe including semi-natural boggy mires, acid flashes and wooded cloughs.
- Reservoirs, common throughout the area.
- Densely populated valley bottoms with stone buildings extending along valley sides, set against the backdrop of the moorland tops.
- Gritstone towns centred around key features of industrial heritage such as textile mills and other industrial development mainly in the valleys but with a group of older settlements on the moorland fringe.
- Main road, rail and canal routes located along valley bottoms, with historic packhorse trails traversing the exposed moorland tops.
- Intrusive features, including wind farm developments, numerous transmission masts, overhead power lines and sandstone, gritstone and clay quarries, mainly on the fringe of the area.
- Extensive views from elevated locations in all directions.

Wind energy development status

Within the study area, the NCA includes four operational wind farm sites at Scout Moor (26 turbines 100m high); Hameldon Hill (3 turbines 90m high); Coal Clough (24 turbines 49m high); and Ovenden Moor (23 turbines 49m high). In addition, there is consented wind energy development at Crook Hill (12 turbines 120m high); and Reaps Moss (3 turbines 120m high).

The part of the NCA that lies within the study area is also affected by wind energy developments in the wider area, notably those around Royd Moor (Yorkshire Pennine Fringe NCA) around 16km to the south-east.

A wind farm application is expected very soon at Hyndburn (12 turbines, 122m) immediately to the west of the study area and also within the Southern Pennines NCA; and there is an outstanding application at Brightender Hill (5 turbines, 101m high) around 19km to the north of the study area within the Yorkshire Dales NCA near Skipton. These developments, together with the proposed repowering at Coal Clough and Ovenden Moor, may affect the landscape in future.

Baseline assessment

This NCA now contains considerable operational and consented wind energy development. Development is no longer concentrated on the fringes of the area (as it was when the NCA key characteristics were written in the late 1990s) but is more widespread.

Development within the study area comprises a total of 91operational and consented turbines, concentrated mainly towards the northern and western edges of the study area, where the wind farms form a broad arc extending from near Ramsbottom almost to Halifax. Sites at Scout Moor, Coal Clough and Crook Hill form a triangle, each being separated by around 9km; while Ovenden Moor lies a further 15km to the east of Coal Clough. Sites at Coal Clough, Reaps Moss and Crook Hill are more closely spaced, around 5km apart along a north-south axis; there will be a marked contrast in size between the turbines at Coal Clough and Reaps Moss where they are seen in the same view.

Together these wind farms exert a strong landscape and visual influence over the northern and western parts of the study area. None are close enough together to read as a cluster; and different combinations and groupings can be seen from different directions, sometimes separate, sometimes overlapping, and often occupying a broad field of view of up to 360˚. There is wide intervisibility between wind farms as most are sited on the moorland plateau tops, and this gives rise to considerable cumulative impacts, particularly affecting high level viewpoints. Within the valley landscapes turbine visibility is reduced, although turbines at the edge of uplands such as Scout Moor can often be seen at very close range from below. Scout Moor and Crook Hill are visible over a broad area within the Manchester conurbation to the south and south-west. Visibility of multiple wind farms also extends to much of the South Pennine 'spine', although the northern and southern sections of the spine are somewhat less affected in this respect than other areas.

The landscape of the northern and western parts of the study area is rapidly becoming a 'landscape with wind farms' ie the extent of development is such that significant change in landscape character is now occurring. This is due not only to the presence of the turbines themselves, but also to the cumulative impacts of associated infrastructure, including visually prominent access tracks, substations, fencing and grid connections. The distinctive open moorland skylines that form an important backdrop to settlements and contrast strongly with the settled character and industrial heritage of the valleys below have been lost some areas (for example the Rossendale valley and Cliviger gorge); and the relatively wild character of the moorland tops, a key recreational resource for large urban populations nearby, has been damaged.

There are cumulative impacts on substantial parts of the South Pennines Heritage Area as well as on the recreational experience of those using the Pennine Way and Pennine Bridleway National Trails and the many other long distance walking routes that occur here. Any further development towards the north or south of the study area could also affect the settings of the Peak District and Yorkshire Dales National Parks, as the Southern Pennines NCA forms an important 'landscape bridge' between the two National Parks.

If further development were to take place at Hyndburn, the arc of wind farm development across the northern and western parts of the study area would be extended and similar effects to those described above would affect an even wider area.

Cumulative issues that need careful consideration in this part of the Southern Pennines NCA are:

- The growing levels of impact on the area's open moorland character, sensitive skylines, many important views, fragile peatlands and other habitats, cultural heritage and valued recreational assets;

- Separation distances and thresholds of wind energy development that can be accommodated if the core landscape values associated with the South Pennines Heritage Area are to be conserved;
- The vulnerability and growing rarity value of undeveloped landscapes – particularly the main upland blocks north and south of the Calder valley, which retain their wild character; and the visually sensitive moorland edges throughout the area;
- Mitigation of the impacts of access tracks and visual clutter associated with existing and consented wind farm development;
- Potential impacts on the setting of the National Parks to north and south.

4.5.5 NCA 37 Yorkshire Southern Pennine Fringe

Key characteristics

- Eastern slopes of the Pennines, dropping from upland in the west down to the east, and dissected by numerous steep-sided valleys.
- Extensive urban influences from the matrix of large and small towns.
- Close conjunction of large scale industry, urban areas and transport routes with open countryside.
- Predominance of local sandstone and 'gritstone' as a building material, notably in large and dominant industrial buildings.
- Urban development mainly confined by valleys creating dramatic interplay of views between settlements and the surrounding hillsides.
- Predominantly pastoral farming with strong linear patterns of walled enclosures on plateaux.
- Predominantly broadleaved woodlands on steep valley sides forming important backdrops to industrialised areas.
- Impression of a well wooded landscape even though tree cover is relatively sparse overall.
- Dense network of roads, canals and railways.

Wind energy development status

Within the study area, the NCA includes operational wind energy development at Dunford Road, Holmfirth (1 turbine estimated 40m high) and consented wind energy development at Scapegoat Hill, Huddersfield (2 turbines 25m high).

The part of the NCA that is in the study area is also potentially affected by the operational wind farm around 5km to the north-west at Ovenden Moor (23 turbines 49m high) in the Southern Pennines NCA. In addition, around 3km to the south-east (near Penistone), there is an operational wind farm at (Royd Moor, 13 turbines 54m high) and two consented wind farms (Hazelhead (3 turbines 100m high) and Blackstone Edge (Barnsley) (3 turbines, 101m high)). This latter group of sites lies within the Yorkshire Southern Pennine Fringe NCA.

In future the area may also be affected by repowering of Ovenden Moor (10 turbines 115m high) and by an application for further development at Spicer Hill next to Royd Moor (5 turbines 84m high).

Baseline assessment

The part of the NCA that lies within the study area has little existing wind energy development and what there is is very small in scale. However the wider landscape context is affected by wind farm development to the north-west at Ovenden Moor and to the south-east near Penistone where a total of 19 existing or consented turbines lie very close to the study area and within the same NCA.

At present wind energy development has little direct impact on the landscape character and landscape fabric of the part of the NCA that lies within the study area. However there are indirect effects. The Ovenden Moor development affects skylines north of Halifax and can be seen from a wide area. The developments around Royd Moor occupy a relatively narrow field of view when seen from the north, but from the south-east affect several of the approaches to Holmfirth and Huddersfield. In addition, these wind farms (when all are built) will be of very disparate heights, and this inconsistency may tend to draw the eye.

If Ovenden Moor were to be repowered it is likely that the impact on the skyline would be greater, even though the number of turbines would be smaller, as the new turbines would be more than twice

the height of existing. Further development near Royd Moor would also increase the impacts of this cluster.

Cumulative issues that need careful consideration in this part of the Yorkshire Southern Pennine Fringe NCA are:

- Cumulative effects of any further wind farm development in the adjoining Southern Pennines NCA on the Pennine skylines to the west, which form important landscape settings for Halifax and Huddersfield;
- The growing impacts of the cluster of existing wind farms on the southern fringes of the area around Royd Moor;
- Potential impacts of any further development in this NCA on the setting of the Peak District National Park, which lies just to the west – the setting of the National Park already having been affected to some degree by the wind energy developments around Royd Moor;
- Compatibility of small and larger new turbines visible around Royd Moor.

4.5.6 NCA 38 Nottinghamshire, Derbyshire and Yorkshire Coalfield

Key characteristics

- Widespread evidence of industrial activity including mine buildings, former spoil tips, and iron and steel plants.
- Complex mix of built-up areas, industrial land, dereliction and farmed open country.
- Many areas affected by urban fringe pressures creating fragmented and downgraded landscapes.
- Substantial areas of intact agricultural land in both arable and pastoral use.
- Small, fragmented remnants of pre-industrial landscape and semi-natural vegetation, including many areas of woodland, river valley habitats, subsidence flashes and other relict habitats.
- Ever present urban influences from major cities, smaller industrial towns and mining villages.
- Widespread influence of transport routes, including canal, road (M1, M62) and rail, with ribbon developments emphasising the urban influence in the landscape.
- Rolling landforms with hills, escarpments and broad valleys.
- Local variation in landscape character reflecting variations in underlying geology.
- Strong cultural identity arising from history of coal mining and other heavy industry.

Wind energy development status

There is no operational, consented or proposed wind energy development in the part of this NCA that lies within the study area.

However the part of the NCA that is within the study area is affected (or potentially affected) by wind energy developments just outside the study area in the Yorkshire Southern Pennine Fringe NCA. These developments, which lie within around 5km, are the operational wind farm at Royd Moor (13 turbines 54m high), the two consented wind farms (Hazelhead (3 turbines 100m high) and Blackstone Edge (Barnsley) (3 turbines, 101m high)), and the application site at Spicer Hill (5 turbines 84m high).

Baseline assessment

The part of this NCA that lies within the study area is not directly affected by wind energy development, but is indirectly affected by the nearby group of sites around Royd Moor. A total of 19 existing or consented turbines are potentially visible from higher ground within this NCA. From this direction these sites form a relatively compact cluster, and occupy a field of view of less than 45˚, but inconsistency in turbine heights may tend to draw the eye. The turbines appear in the foreground of views to the Dark Peak landscape beyond although they lie several km outside the National Park itself.

Further development at Spicer Hill would not extend the apparent size of the cluster when seen from this direction, but might exacerbate the issue of inconsistency in turbine heights.

Cumulative issues that need careful attention in this part of the Nottinghamshire, Derbyshire and Yorkshire Coalfield NCA are:

- Potential impacts on the setting of the Peak District National Park of any new development in this NCA that may be seen in conjunction with existing development sites around Royd Moor;
- Compatibility of small and larger new turbines visible around Royd Moor.

4.5.7 NCA 51 Dark Peak

Key characteristics

- Dramatic character created by sharply defined, elevated and vast plateaux with 'gritstone ridges' and edges and long uninterrupted views.
- Wild and remote semi-natural character created by blanket bog, dwarf shrub heath and heather moorland with rough grazing and a lack of habitation.
- Contrasting valley heads created by combination of sheltered, deeply-incised cloughs with fast-flowing streams around margins of plateaux and greater diversity of vegetation including semi-natural broadleaved woodland.
- Cultivated character of margins created by in-bye with dispersed farmsteads, gritstone wall boundaries and hedgerows in valley bottoms and small scale of enclosure.
- Major valleys some of which are dominated by coniferous woodland and reservoirs.
- Durable and stocky architectural style to dispersed buildings and settlements constructed from local gritstone with typical blackened appearance.

Wind energy development status

There is no operational, consented or proposed wind energy development in the part of this NCA that lies within the study area.

However the part of the NCA that lies within the study area is affected (or potentially affected) by wind energy developments just outside the study area in the Yorkshire Southern Pennine Fringe NCA. These developments, which lie within around 5-8km, are the operational wind farm at Royd Moor (13 turbines 54m high), the two consented wind farms (Hazelhead (3 turbines 100m high) and Blackstone Edge (Barnsley) (3 turbines 101m high), and the application site at Spicer Hill (5 turbines 84m high) just north of Royd Moor.

Baseline assessment

The part of this NCA that lies within the study area is not directly affected by wind energy development, but is indirectly affected by the nearby group of sites around Royd Moor, where a total of 19 existing or consented turbines are potentially visible looking south-east and east from the edge of the moorland plateaux within the Peak District National Park. The areas most affected lie just outside the study area at Thurlstone Moor and the Transpennine Trail, but parts of the study area are also affected. In addition, inconsistency in turbine heights may tend to draw the eye.

Further development at Spicer Hill would not extend the apparent size of the cluster when seen from this direction but might exacerbate the issue of inconsistency in turbine heights.

Cumulative issues that need careful attention in this part of the Dark Peak NCA are:

- Potential impacts on views from the Peak District National Park of any wind energy developments on its fringes;
- Need for appropriate separation from the cluster of existing wind energy development sites around Royd Moor;
- Compatibility of small and larger new turbines visible around Royd Moor.

4.5.8 NCA 54 Manchester Pennine Fringe

Key characteristics

- Transitional zone between wild open moorlands and densely populated urban areas with an abrupt boundary where the town stops and the countryside starts.
- 18th and 19th century stone and brick-built industrial buildings including mill lodges and

reservoirs originating from the woollen and cotton industry along the valley bottoms and providing important heritage features.
- Broadly similar elevational range of 100-300 metres largely comprising ridges and steep sided valleys with fast flowing rivers.
- Stock rearing and rough grazing on improved grassland between urban areas.
- Field boundaries include dry 'gritstone' walls at higher elevations and hedgerows at lower elevations with predominance of holly along valley bottoms.
- Countryside with an unkempt appearance due to heavy recreational demands and diversification of farming into uses such as haulage and riding schools.
- Mineral extraction related to the quarrying of local sandstones creates prominent scars on the landscape.
- Historic trans-Pennine communication routes, especially railways and canals, form important part of the cultural landscapes.
- Woodland cover is sparse overall with concentrated pockets confined to narrow, steep-sided river valleys.
- Overspill housing estates including high rise blocks form unsympathetic elements in the landscape.
- Elevated vantage points providing extensive views across adjacent Manchester conurbation.

Wind energy development status

Within the study area, the NCA includes no operational or consented wind energy development sites. However there is an application site at Sillinghurst Farm, Bury (1 turbine estimated 40m high).

The part of the NCA that lies within the study area is also affected by wind farms in the Southern Pennines NCA, notably by the operational wind farm at Scout Moor around 4km to the north (26 turbines 100m high) and the consented wind farms at Crook Hill around 3km to the north (12 turbines 120m high) and Reaps Moss around 6km to the north (3 turbines 120m high).

Baseline assessment

There is no existing wind energy development in the part of this NCA that lies within the study area, but the wider landscape context is strongly affected by the Scout Moor, Crook Hill and Reaps Moss wind farms close to the north, which have a total of 41 operational and consented turbines.

These sites occupy a wide field of view (over 90˚ in the northern part of the NCA) and are prominently located relative to the urban areas to the south. All three sites are theoretically visible over extensive areas and strongly affect the moorland skylines that frame the northern side of the Greater Manchester conurbation – skylines that until comparatively recently were ‘wild and open’ as the NCA’s key characteristics suggest.

As well as affecting the characteristic setting of, and views from, the urban area, the wind farms to the north have a significant impact on approaches to Greater Manchester, especially the elevated approach from Yorkshire on the M62. Other major transport routes in this part of the NCA (M62 eastbound, M60, M66) are also affected by simultaneous, successive and sequential views of multiple wind farms at relatively close range.

If further development were to take place at Hyndburn, it is probable that this would increase the field of view occupied by wind farms, further affecting the northern setting of the NCA and generating additional cumulative visual impacts.

Cumulative issues that need careful attention in this part of the Manchester Pennine Fringe NCA are:
- Cumulative impacts on the ‘wild and open’ moorland skylines;
- Cumulative impacts on views from and approaches to Greater Manchester;
- Potential encirclement of the urban areas by wind farms if further development takes place on the West Pennine Moors to the west and/or the South Pennines Moors to the east.

4.5.9 NCA 55 Manchester Conurbation

Key characteristics Only a very small part of this NCA lies within the study area and no key characteristics are available for the NCA.
Wind energy development status There are no known operational, consented or proposed wind energy developments (greater than 25m high) in this part of the study area. However the area is affected by views to wind farm developments to the north, notably the operational wind farm at Scout Moor (26 turbines 100m high) which lies around 13km to the north; the consented wind farm at Crook Hill (12 turbines 120m high) which lies around 16km to the north-east; and the consented wind farm at Reaps Moss (3 turbines 120m high) which lies around 19km to the north-east.
Baseline assessment Given the distance between these developments and the NCA, existing landscape and visual impacts are relatively limited. There are some effects on skylines and on approaches to Bury and Rochdale from the west on the M62 in conditions of good visibility. There are no significant cumulative issues for this area at the present time.

4.6 Updating the Baseline and the Baseline Assessment

This baseline assessment represents a snapshot of the landscape and visual impacts of existing wind energy development in and around the study area as at October 2009. It will need to be regularly updated to take account of further wind energy development within the study area and a 30km radius around.

To facilitate updating of the assessment in future, we recommend that the authorities should develop and maintain a central register and map of wind farm developments, similar to *Figure 6* and its accompanying tables.

5 Landscape Sensitivity and Capacity Assessments

5.1 Spatial Framework

The study brief specified that the assessment should be based on agreed landscape character types and areas, informed by the National Character Areas. Following discussion with the study Steering Group it was decided that the spatial framework for the landscape sensitivity assessment should be local authority level landscape character types (*Figure 7*) while the capacity assessment should focus on broader capacity areas (see *Figure 8*). The background to the choice of this spatial framework is set out below.

5.1.1 Landscape Character Types

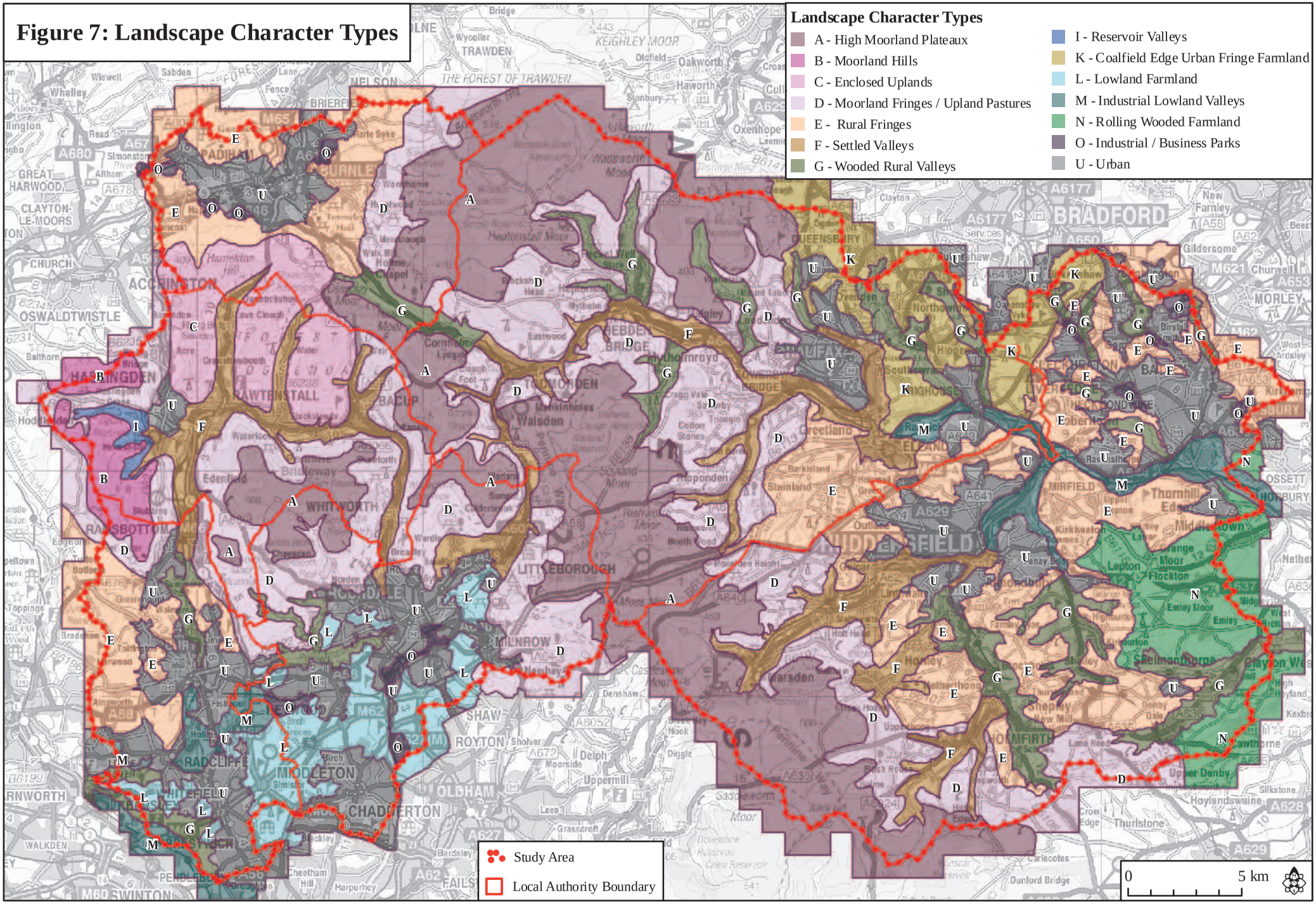
The majority of the study area is already covered by the SCOSPA landscape character assessment[15] and/or the Lancashire landscape character assessment[16] (which uses a very similar landscape typology), but landscape character assessment coverage for some districts (Bury, Calderdale, Kirklees and Rochdale) was found to be incomplete or inconsistent with these assessments. Accordingly, it was agreed that the framework of landscape character types (LCTs) should be an extension of that used in the SCOSPA *South Pennines Landscape Character Assessment* (which has been subject to public consultation and covers the largest part of the study area) with new types being added as required. Further details of the LCTs can be found in *Annex 1*; while *Annex 2* provides more detailed landscape character information for Bury, Calderdale, Kirklees and Rochdale as an additional study output.

The final list of fourteen LCTs is as follows, with types L to O and U being new[17]:

A: High Moorland Plateaux
B: Moorland Hills
C: Enclosed Uplands
D: Moorland Fringes/ Upland Pastures
E: Rural Fringes
F: Settled Valleys
G: Wooded Rural Valleys
I: Reservoir Valleys
K: Coalfield Edge Urban Fringe Farmland
L: Lowland Farmland
M: Industrial Lowland Valleys
N: Rolling Wooded Farmland
O: Industrial/Business Parks
U: Urban

[15] Land Use Consultants (1999) *South Pennines Landscape Character Assessment* (1999), report to Standing Conference of South Pennine Authorities (SCOSPA).
[16] Environmental Resources Management (2000) *A Landscape Strategy for Lancashire: Landscape Character Assessment*, Report to Lancashire County Council.
[17] SCOSPA Types H and J are not present in the study area so these letters have not been used.

Figure 7: Landscape Character Types



5.1.2 Capacity Areas

The selection of an appropriate framework within which to assess capacity presented some difficulties. While the LCTs could have been used, some of these cover very extensive areas; and as generic units they occur in different parts of the study area, so are not very suitable as a means of indicating where wind energy development may or may not be accommodated in the landscape. The LCTs are subdivided into landscape character areas (LCAs), and these too were considered as possible working units. However many of the LCAs are very small (due to the densely settled character of much of the study area), so if used as a framework for capacity assessment the assessment would have become almost site-specific, which was considered inappropriate for a strategic study of this kind.

Another possible unit for capacity assessment would perhaps have been a higher level landscape character area, ie an area with a distinct and recognisable character and identity at a scale somewhere between the NCAs and the LCAs. However no such landscape units currently exist within the study area. Hence – in discussion with the Steering Group – the decision was taken to develop a broad, pragmatic subdivision of the study area for the purposes of the capacity assessment only.

The capacity areas (CAs) represent the major upland and lowland units within the study area. They are working units that should be recognisable to planners and to local people although they are not part of any formal landscape character assessment. They are intended to complement the LCTs, which remain the principal *landscape* framework for the assessment. Their boundaries are generalised and broad-brush, but they represent the main areas of landscape and visual association, informed by strategic analysis of topography (including ridgelines, watersheds and valleys) and the way in which it influences visibility. They were developed initially during early field work and familiarisation during which visibility was analysed; were then subject to desk study; and finally were checked and confirmed during later field work.

The twelve CAs are:

1: Burnley
2: West Pennine Moors
3: Forest of Rossendale
4: Scout Moor
5: South Pennine Moors
6: Calder Valley Moorland Fringe
7: Halifax and Brighouse
8: Huddersfield and Dark Peak Fringes
9: Batley and Dewsbury
10: Emley Moor
11: Northern Dark Peak
12: Bury, Radcliffe and Rochdale

The more detailed rationale for the development and use of the each of the CAs is briefly given at the top of each of the capacity assessment sheets under the headings ‘Location and Context’ and ‘Intervisibility’. This describes how the CA relates to its constituent LCTs and also explains the context in visual and perceptual terms.

Figure 8: Capacity Areas

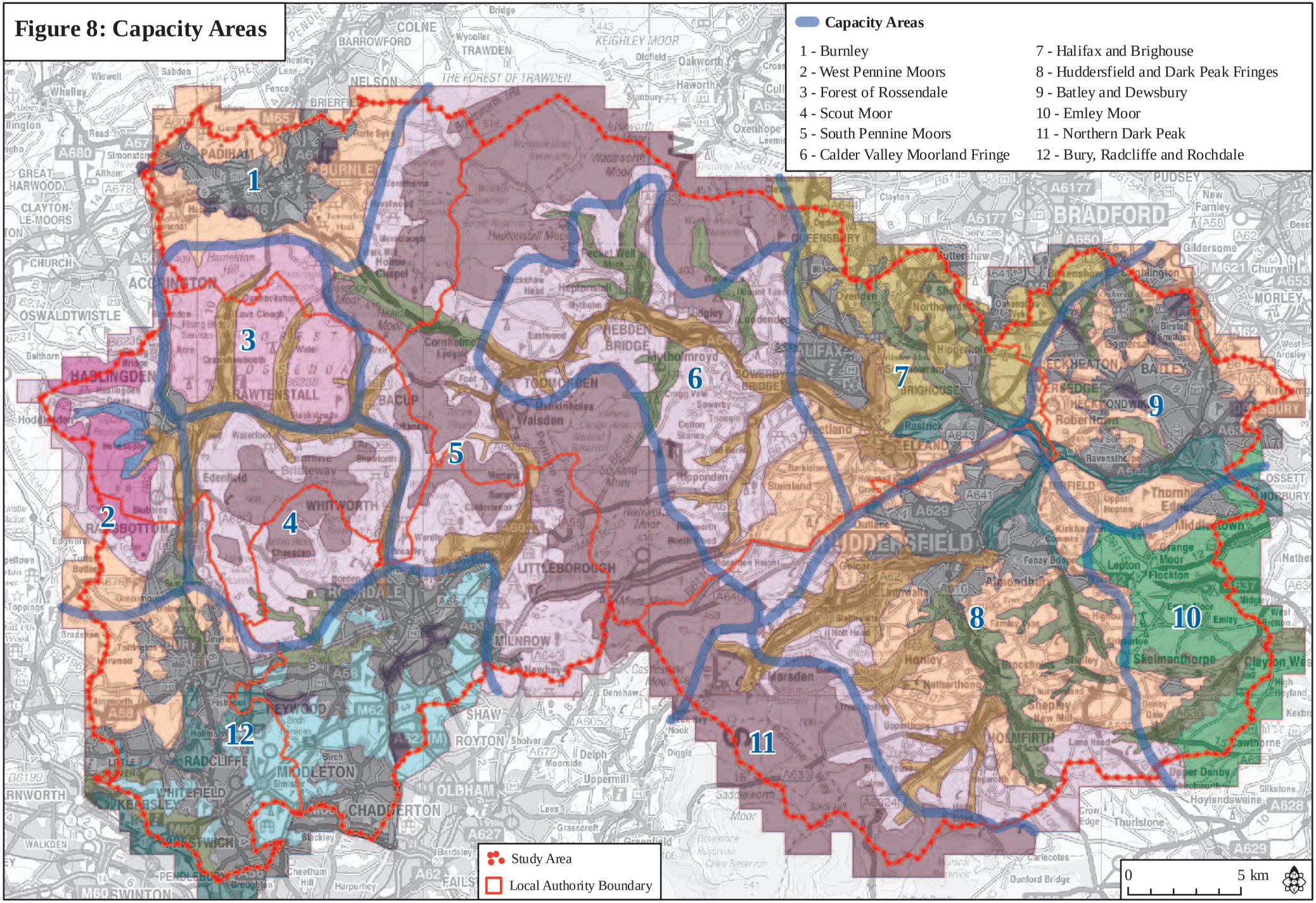


Table 9 summarises the spatial framework for the assessment, including key relationships between the NCAs, CAs, LCTs and local authority areas.

Table 9: Summary of Spatial Framework for the Assessment

NCA	Capacity Areas	LCTs in Capacity Areas	Local Planning Authorities in Capacity Areas
NCA 35 Lancashire Valleys	1: Burnley	E: Rural Fringes O: Industrial/ Business Parks U: Urban	Burnley
NCA 36 Southern Pennines	2: West Pennine Moors	B: Moorland Hills D: Moorland Fringes/ Upland Pastures E: Rural Fringes I: Reservoir Valleys U: Urban	Rossendale Bury
	3: Forest of Rossendale	C: Enclosed Uplands F: Settled Valleys U: Urban	Rossendale Burnley
	4: Scout Moor	A: High Moorland Plateaux D: Moorland Fringes/ Upland Pastures F: Settled Valleys G: Wooded Rural Valleys	Rossendale Rochdale Bury
	5: South Pennine Moors	A: High Moorland Plateaux D: Moorland Fringes/ Upland Pastures F: Settled Valleys G: Wooded Rural Valleys	Burnley Rossendale Calderdale Rochdale Kirklees
	6: Calder Valley Moorland Fringe	A: High Moorland Plateaux D: Moorland Fringes/ Upland Pastures E: Rural Fringes F: Settled Valleys G: Wooded Rural Valleys	Calderdale Kirklees
NCA 37 Yorkshire Southern Pennine Fringe	7: Halifax and Brighouse	E: Rural Fringes F: Settled Valleys G: Wooded Rural Valleys K: Coalfield Edge Urban Fringe Farmland M: Industrial Lowland Valleys U: Urban	Calderdale
	8: Huddersfield and Dark Peak Fringes	D: Moorland Fringes/ Upland Pastures E: Rural Fringes F: Settled Valleys G: Wooded Rural Valleys M: Industrial Lowland Valleys U: Urban	Kirklees
	9: Batley and Dewsbury	E: Rural Fringes G: Wooded Rural Valleys M: Industrial Lowland Valleys O: Industrial/ Business Parks U: Urban	Kirklees
NCA 38 Nottinghamshire, Derbyshire and Yorkshire Coalfield	10: Emley Moor	E: Rural Fringes G: Wooded Rural Valleys N: Rolling Wooded Farmland U: Urban	Kirklees
NCA 51 Dark Peak	11: Northern Dark Peak	A: High Moorland Plateaux D: Moorland Fringes/ Upland Pastures F: Settled Valleys	Kirklees Peak District National Park
NCA 54 Manchester Pennine Fringe and NCA 55 Manchester Conurbation	12: Bury, Radcliffe and Rochdale	E: Rural Fringes G: Wooded Rural Valleys L: Lowland Farmland M: Industrial Lowland Valleys O: Industrial/ Business Parks U: Urban	Rochdale Bury

5.2 Sensitivity Assessment Sheets

For each LCT, the landscape was systematically assessed against the landscape sensitivity criteria set out in *Table 3*. The findings of those assessments are presented in the sensitivity assessment sheets below. No sensitivity assessment is provided for the urban landscape character type, which is almost wholly built up.

As qualitative judgements are required against each criterion, no explicit sensitivity 'ratings' are provided; however the assessment sheets do indicate, in general terms, whether sensitivity on that criterion is towards the higher or lower end of the range, or somewhere in the middle.

The assessment sheets include an *overall* assessment of the level of sensitivity of each LCT (see *Section 2.3* for definitions of sensitivity levels), as a summary of sensitivity across all the criteria. This is accompanied by a description of any broad spatial variations in sensitivity across the LCT.

It should be noted that within many LCTs there is considerable spatial variation in sensitivity level. The overall sensitivity level is therefore the level that prevails over most of the LCT's geographic area. Localised areas of higher or lower sensitivity may also exist.

In two cases (A: High Moorland Plateaux and D: Moorland Fringes/ Upland Pastures) different parts of the LCT clearly have different overall sensitivities, and are given separate, different sensitivity levels. This reflects the fact that these LCTs are especially extensive and show distinct patterns of variation in sensitivity.

Table 10 provides a summary of overall sensitivity by LCT. *Figure 9* (which follows the sensitivity assessment sheets) is a map of sensitivity by landscape character type.

Table 10: Summary of Overall Sensitivity by Landscape Character Type

LCT	Name	Overall Sensitivity
A	High Moorland Plateaux	High (Moderate-High in the west)
B	Moorland Hills	Moderate-High
C	Enclosed Uplands	Moderate-Low
D	Moorland Fringes/ Upland Pastures	High (locally Moderate-High)
E	Rural Fringes	Moderate
F	Settled Valleys	Moderate-High
G	Wooded Rural Valleys	Moderate-High
I	Reservoir Valleys	Moderate-High
K	Coalfield Edge Urban Fringe Farmland	Moderate-Low
L	Lowland Farmland	Moderate-Low
M	Industrial Lowland Valleys	Moderate-Low
N	Rolling Wooded Farmland	Moderate-Low
O	Industrial/Business Parks	Low
U	Urban	Not assessed

The sensitivity assessments and the map of sensitivity by landscape character type are intended as broad guidance only. The fact that a landscape character type is identified as being of high (or relatively high) sensitivity overall does not mean that it has no capacity for wind energy development in any location.

This is because (as indicated above) most LCTs vary in sensitivity across their areas; and also because sensitivity varies depending on the scale of wind energy development proposed. Hence it is important that both the sensitivity assessment and the capacity assessment for a given location should be read together when considering any specific development site or proposal.

Landscape Character Type A: High Moorland Plateaux

Location and Context

This type occurs principally in the western half of the study area where it covers most of the higher ground. It dominates the South Pennine ridge, extending from the edge of Wessenden Moor in the south to near Haworth in the north. It is split into two main blocks north and south of the Calder valley but these blocks are linked visually by the relatively narrow ridge that runs north-south from Crook Hill to Heald Moor. Further west, Scout Moor forms an outlier of the same type.

Assessment Against the Landscape Sensitivity Criteria	Sensitivity Lower ↔ Higher		
Scale The high moorland plateau lies mainly between 300 and 500m AOD, and is relatively large in terms of vertical scale. However horizontal scale varies. The two main plateau blocks north and south of the Calder valley have an expansive character, but other areas such as the narrow ridge from Crook Hill to Heald Moor do not and hence are more sensitive.		■	
Landform On the tops, this is a large scale sweeping landform. However the high ridges are narrow in places and are intersected by numerous deeply incised valleys; and alternating tough gritstones and softer shales have created a characteristic stepped profile with prominent tors and regoliths. These factors may heighten landscape sensitivity.		■	
Landcover The characteristic semi-natural vegetation cover includes blanket bog, heather moor and extensive areas of grass moor and the landscape is generally unenclosed. Sensitivity is often fairly low, but on the edges of the plateau may be higher, due to the presence of walled, often historic, enclosures that are vulnerable to physical disturbance eg on the southern fringes of Crook Hill.		■	
Built environment This type is highly sensitive in that it is characteristically open and undeveloped, in contrast to the adjoining valleys. However locally the landscape may be affected by quarries on plateau edges, transmission lines and increasingly, wind energy developments (including associated masts, access tracks, fencing and grid connections), reducing its sensitivity. This is particularly the case towards the west, around Scout Moor and east of Bacup.		■	
Skylines and settings The sharp edges of the high moorland plateaux are highly sensitive because they are extremely prominent visually (particularly where narrow ridges or fingers of moorland extend outwards from the main ridgelines). They often form open, unspoilt and highly valued backdrops to the settlements in the valleys below. The presence of hilltop monuments such as Stoodley Pike may also heighten sensitivity locally.			■
Visibility and views The moorland plateaux are characteristically open in character, with expansive views and wide areas of intervisibility, and in this sense they are highly sensitive. They are visible from many well-known vistas and tourist viewpoints, including Blackstone Edge, Stoodley Pike and the Pennine Way; such views tend to occur mainly on higher ground along the main South Pennine ridge. Visibility from the settled valleys below may be more limited where views are contained by steep enclosing hillsides. However there are also many more distant views, notably from Greater Manchester to the south-west and Pendle Hill (part of the Forest of Bowland AONB) to the north-west.			■

A: High Moorland Plateaux (continued)			
Landscape quality (condition) The landscape quality of the moorland plateaux is generally good, but some areas have been adversely affected by lack of management, or by urban fringe pressures such as flytipping and scrambling. Again, this is particularly the case towards the west.		■	
Scenic quality The high scenic quality of the South Pennine moors has long been recognised. The southern section of this type lies within the Peak District National Park; and most of this type, with the exception of Scout Moor, lies within the area of the South Pennines that was identified in 1947 by the National Parks Committee as a potential AONB. Today, Pennine Prospects promotes the protection and regeneration of these landscapes, which are valued regionally as part of the non-statutory South Pennines Heritage Area and the Watershed Landscape Project.			■
Wildness and tranquillity This is a windswept, exposed upland landscape that possesses a strong sense of remoteness and 'wildness'. It is very sparsely settled and this lends a sense of isolation and relative tranquillity which is rare and highly valued, especially given the close proximity to large urban areas. The area of highest tranquillity lies in the north of the study area around Heptonstall, Widdop and Wadsworth Moors. Locally, views to development may diminish the sense of isolation.			■
Natural and cultural heritage features A very high proportion of this landscape character type is covered by the South Pennine Moors SSSI, SAC and SPA, which extends both north and south of the Calder valley and is of international importance for its mosaic of upland habitats and bird life. Much of the landscape character type as a whole is covered in deep peat. Locally there are also areas of high geological interest, including several geological SSSIs. The area is an important archaeological landscape with much prehistoric interest, often associated with the blanket bog.			■
Cultural associations This is a landscape with strong cultural and literary associations, forming a 'wild' backdrop to the novels of the Brontës and an inspiration for the poetry of the former Poet Laureate Ted Hughes. It is of high sensitivity in this regard.			■
Amenity and recreation The southern section of this type lies within the Peak District National Park. The type as a whole is a key recreational resource for surrounding urban populations, with extensive areas of open access land and a strong concentration of National Trails (including substantial sections of the Pennine Way and Pennine Bridleway) and other long distance recreational routes. It provides access to open, relatively wild landscapes for 7 million within an hour's drive.			■

Overall Sensitivity Assessment: High (Moderate-High in the west)

Overall, this type is of high sensitivity over most of its area. It is important to the continuity of the Pennine backbone (see p33) and is highly sensitive for this reason, particularly where the moorlands narrow, as between Crook Hill and Heald Moor. Although otherwise not of the highest sensitivity in character terms, this is outweighed by the fact that the landscape is very highly valued for its scenic quality, wildness and tranquillity, natural and cultural heritage features, cultural associations, and recreational interests and opportunities, which are often of national or even international importance.

Land of highest sensitivity occurs on the edges of the plateaux where scale comparisons are most easily made and turbines are most prominent visually; in areas with particularly distinctive landform or field enclosure patterns; in areas where the sense of wildness and tranquillity remains strong, especially in the north; and at the northern and southern ends of the South Pennine ridge within the South Pennine Moors SSSI, SAC and SPA. Locally there are significant areas of somewhat lower (moderate-high) sensitivity, particularly around Scout Moor to the west, where the landscape has already been affected by extensive wind energy development and other influences such as quarrying and urban fringe pressures, and is also of lesser scenic quality and natural heritage interest.

Landscape Character Type B: Moorland Hills

Location and Context

This type occurs west of Haslingden and Ramsbottom on the western edge of the study area, within the West Pennine Moors. It comprises lower outlying blocks of moorland to the west of Scout Moor and the main Pennine ridge. The moorland occurs in a number of discrete blocks, including Haslingden Moor and Musbury Heights in the north (around Haslingden Grane); and Holcombe Moor in the south. The type also extends westwards beyond the study area.

Assessment Against the Landscape Sensitivity Criteria	Sensitivity Lower ↔ Higher		
Scale These moorland hills rise to around 350 to 400m AOD within the study area; while the valley floors and reservoirs to the east lie at around 150m to 230m. The vertical scale of the hills is therefore relatively modest. The horizontal scale of the landscape is also modest, as the open moorland hill tops are generally only 1-2km wide in this area.		■	
Landform In general this landscape character type has a gentler and more rounded profile than the high moorland plateaux. However the land that lies within the study area is in transition from the moorland plateaux. Hence around the glaciated valley of Haslingden Grane and around Ramsbottom the hills retain steep, sharp edges with distinctive tops such as Bull Hill as well as deep cloughs at the moorland edge, and this tends to increase landscape sensitivity.		■	
Landcover There is a mosaic of upland habitats, including blanket bog, heather moor, wet heath and acid grassland. However grass moor dominates and the landscape is generally unenclosed, so sensitivity is relatively low in this respect. Locally where there are walled enclosures, for example around High Moss and Musbury Brook, sensitivity is higher.	■		
Built environment This type, like the high moorland plateaux, is highly sensitive in that it is characteristically open and undeveloped, in contrast to the valleys to the east. Locally the landscape is affected by quarrying on the moorland edges, reducing sensitivity to some degree, but there are few other intrusive influences, so sensitivity overall is high.			■
Skylines and settings The hills form a significant backdrop to the surrounding towns. Within the study area the steep, undeveloped edges of the hills form the immediate western landscape setting for Haslingden and Ramsbottom and are highly sensitive for this reason. The southern tip of Holcombe Moor is particularly sensitive as it lies very close to Ramsbottom, forms the backdrop to the Holcombe village Conservation Area (a unique pre-industrial settlement) and includes the prominent landmark of Peel Tower, which is visible for miles around.			■
Visibility and views These hills are very widely visible from long distances, particularly from the east and south. At the edges of the hills the landform permits extensive views out across the surrounding hills, urban areas and lowland valleys. The Rossendale Way closely follows the edge of the hills, taking advantage of these views, particularly around Ogden Reservoir. Peel Tower is also a very popular recreational viewpoint. All these factors contribute to high sensitivity.			■

B: Moorland Hills (continued)			
Landscape quality (condition) The landscape quality of the moorland hills is generally good, but some areas have been adversely affected by lack of management, peatland erosion, urban fringe pressures such as flytipping and scrambling, and infrastructure such access tracks. Sensitivity is medium.		■	
Scenic quality The West Pennine Moors landscape, the eastern edge of which lies within the study area, contains a rich variety of natural and industrial heritage. Although it lacks statutory landscape designation, it is widely recognised for its scenic quality. The West Pennine Moors Partnership works to conserve and enhance the area's landscape character and natural and historic assets, sustain rural communities and contribute to the well-being of adjoining urban communities. The area around Haslingden Grane, including Fairy Glen, is a local beauty spot, sometimes referred to as 'Little Scotland'.			■
Wildness and tranquillity The high moorland tops have a sense of remoteness, isolation and wildness, created by the altitude, absence of settlement and long, wide views. However the sense of wildness is diminished to some extent by the fact that the individual moorland blocks are relatively small in extent and have panoramic views across adjacent urban areas, so overall the area is not of the highest sensitivity.		■	
Natural and cultural heritage features The deep peat and blanket bog on the summits are important natural and archaeological resources and are vulnerable to damage, some areas already being affected by erosion. There is evidence of prehistoric settlement and a rich concentration of prehistoric sites, including Mesolithic flints, evidence of Neolithic activity on Holcombe Moor and extensive Bronze Age remains.		■	
Cultural associations The Peel Tower on Holcombe Moor commemorates Sir Robert Peel, Prime Minister of Britain between 1841 and 1846 and founder of the modern Police Force.		■	
Amenity and recreation The moorland hills, as part of the West Pennine Moors, provide a 'wild space' for urban populations in Greater Manchester and many of the Lancashire towns. The proximity to these nearby urban centres means that these moors are very important for recreation, with an extensive rights of way network and many opportunities for quiet enjoyment such as walking, cycling, and horse-riding, promoted by the Partnership. There is extensive open access land and the Rossendale Way runs the length of the area.			■

Overall Sensitivity Assessment: Moderate-High

This type is of moderate-high sensitivity. It has a relatively open, undeveloped character; some important skylines, settings and views; areas of recognised scenic quality; some natural and cultural heritage interest; and is of regional recreational importance as part of the West Pennine Moors.

Areas of highest sensitivity are around Haslingden Grane and Holcombe Moor, where there are important skylines, settings and views, as well as notable cultural heritage and recreational features. The open moorland hill tops on the western edges of the study area may be somewhat less sensitive than other areas due to their rounded profiles and setback from the steep moorland edges and settlements to the east.

Landscape Character Type C: Enclosed Uplands

Location and Context

This type occurs in one area only, the Forest of Rossendale. Here three spurs of undulating high plateau extend northwards from the Irwell valley towards Burnley, separated and bounded by a series of settled valley landscapes. A distinguishing characteristic of these uplands is their enclosure – a network of gritstone walls enclosing virtually all of the upland area. Unlike the empty moorland landscapes of the South Pennines, the area is dotted with isolated farms and small settlements.

Assessment Against the Landscape Sensitivity Criteria	Sensitivity Lower ↔ Higher		
Scale The area forms a raised upland plateau at approximately 300m AOD, rising to summits and ridges at about 400m; it is somewhat lower in altitude than the main South Pennines ridge to the east. This is a relatively large scale landscape topographically, the open, elevated topography creating a feeling of space. There is a relatively small height differential between the plateau top and the valley floors, particularly in the north. Scale sensitivity is relatively low.	■		
Landform This is an undulating, generally undramatic landform of Lower Coal Measures capped by Millstone Grit and glacial boulder clay. The distinctive gritstone edges are mainly confined to the terraces above the Irwell valley, for example at Cribden Hill. Further north the landform becomes more regular and rounded although some tops, such as Great Hameldon in the north-east, are more distinctive. Other topographic variations include the hummocky forms of former coal and lead workings.		■	
Landcover Vegetation is dominated in the south by improved grassland and in the north by grass moor, with isolated peat-covered moors at Cribden Hill, Swinshaw Moor and Small Shaw Heights as well as more extensive areas of moor on the area's northern edge where a number of reservoirs and some commercial forestry also occur. Trees are generally absent on higher ground. The landcover variety and presence of field enclosures (although these are generally fairly large) mean that the area is of medium sensitivity.		■	
Built environment The landscape is dotted with small isolated farms, many now abandoned. The area's industrial history is evident in small miner-farmer smallholdings; former coal and lead mines and associated spoil heaps; and more extensive areas of former quarrying, eg on Hameldon Moor. Transmission lines also cross the north-east edge of the area. These human influences tend to reduce sensitivity.	■		
Skylines and settings The skyline scarps in the southern part of this area are relatively sensitive as they closely overlook the settlements of the Irwell valley, providing a countryside setting for towns including Haslingden, Rawtenstall and Bacup. The northern edge of the landscape type also forms a sensitive (albeit more distant) skyline that is part of the eastern setting to Accrington and the southern setting to Burnley.		■	
Visibility and views This landscape is widely visible from Burnley and the Forest of Bowland AONB to the north. It is less visible from the west, south and east, where views are contained by steep valley sides and adjoining hills and moors. The main north-south road routes and the east-west Rossendale and Burnley Ways (which connect southwards to the Pennine Bridleway) offer panoramic views.		■	

C: Enclosed Uplands (continued)			
Landscape quality (condition) The overall impression is of a landscape in decline, with rush infested pastures and abandoned farm buildings. Most of the hill areas remain in agricultural use and are still grazed by sheep, but it is clear that farming here is at the margins of economic viability. Many boundaries are poorly maintained and contribute to a bleak, neglected appearance. Landscape sensitivity is relatively low.	■		
Scenic quality Although this area is part of the non-statutory South Pennines Heritage Area, it is not part of the Watershed Landscape and its scenic quality is not especially high. Protection and regeneration of its landscapes, like those of the rest of the Heritage Area, are promoted by Pennine Prospects.		■	
Wildness and tranquillity There is some sense of relative wildness and tranquillity within this landscape, particularly on areas of moorland and other high ground. However perceptions of remoteness are often diminished by views towards urban areas and the presence of human artefacts.	■		
Natural and cultural heritage features Deep peat and blanket bog on the higher summits provide upland bird habitat and archaeological interest. Medieval bell pits and industrial age relicts of the coal and lead mining industries are of cultural heritage importance.		■	
Cultural associations In the medieval period the area was part of the feudal Forest of Rossendale hunting forest, which was subsequently enclosed in the eighteenth and nineteenth centuries. The enclosed uplands remain a distinct and unusual cultural landscape, characterised by high altitude enclosure, industrial and lead mining remnants, and a settlement pattern of small scattered dwellings and urban terraces.			■
Amenity and recreation A particular feature of this type is the dense network of public footpaths, which may relate to early industrial activity and continue to provide recreational access to the countryside, especially in the southern part of this area. The Burnley and Rossendale Way long distance recreational routes connect areas of open access land to the north; while the route of the Pennine Bridleway National Trail runs north-south across enclosed uplands.		■	

Overall Sensitivity Assessment: Moderate-Low

Overall the sensitivity to wind energy development of the enclosed uplands is moderate-low. The area's open, expansive scale; relatively low landscape quality; and reduced sense of wildness and tranquillity compared to other South Pennines upland areas tend to lessen its sensitivity.

The most sensitive parts of the landscape are the lower, enclosed, southern fringes overlooking the Irwell valley; and the prominent northern and western moorland tops. The least sensitive areas are the central parts of each of the upland blocks, where there tend to be fewer constraints in terms of skylines, visibility, landscape quality, deep peat and other biodiversity interests.

Landscape Character Type D: Moorland Fringes/ Upland Pastures			
Location and Context The enclosed landscapes of the moorland fringes and upland pastures fringe the high moorland plateaux and moorland hills (types B and C) on all sides. They typically occur on the broad terraces that separate the main river valleys from the open moors around Rochdale, Bury, the Irwell valley and the Calder valley, as well as in the area south and south-west of Huddersfield on the edge of the Dark Peak.			
Assessment Against the Landscape Sensitivity Criteria	**Sensitivity Lower ↔ Higher**		
Scale These landscapes are relatively small in scale. They are transitional, contained uphill by the high moorland plateaux and downhill by the settled valleys and rural fringes, so their horizontal extent is often quite limited (typically 2-3km). In addition, the subdivision of the land into a patchwork of small fields and larger intakes enclosed by gritstone walls heightens sensitivity in terms of scale.			■
Landform This type occupies the high land fringing the main moorland blocks at between 250 and 300m AOD. It includes the immediate slopes to either side of the main upland ridge as well as the terraces that occur above the main South Pennine valleys such as that of the River Calder. The distinctive terraced landform is often relatively flat, steepening both above and below. These marked landform changes mean that it is of at least medium sensitivity.		■	
Landcover The land is almost entirely grazed pasture, most farms also having rights for summer grazing on the moorland above. The lower gentler slopes comprise older enclosures distinguished by their small size and irregular patterns; while higher and steeper slopes tend to have larger more regular parliamentary enclosures and intake land. The strong, often ancient, enclosure patterns and networks of narrow winding lanes are very vulnerable to physical disturbance.			■
Built environment Much of the area has an established historic built character and is of high sensitivity in this respect. Locally certain areas are affected by other influences eg quarrying on the moorland edges above the Irwell valley; urban fringe uses such as riding stables close to Rochdale; and commercial development on the south-western outskirts of Huddersfield. The landscape is also affected in parts eg around Bacup by transmission lines, routed to avoid the open moorland tops.		■	
Skylines and settings These landscapes may form an immediate skyline when seen at close range from the valley settlements below and in this context may be highly sensitive. Where slopes are gentler and views slightly longer they may not form part of the skyline but may nonetheless provide the foreground and setting to the high moorland plateaux and be sensitive in this respect, their green patchwork of fields contrasting with the more subdued tones of the moors above.		■	
Visibility and views At the main upland edges, eg south of Scout Moor and south-west of Huddersfield, these landscapes are widely visible over long distances. Where these landscapes occur within the upland area, eg between Todmorden and Littleborough, visibility may be somewhat more limited. The landscape generally has an open character often with long views out across the valleys; and views may be spectacular where walking routes traverse the valley sides, eg north and south of the Calder valley. Sensitivity is therefore high.			■

D: Moorland Fringes/ Upland Pastures (continued)			
Landscape quality (condition) Landscape quality is mainly fairly high, although locally the landscape may be affected by farm decline and abandonment and by the introduction of non-agricultural uses, particularly in the western parts of the area, where farming is more marginal and urban fringe influences strong.		■	
Scenic quality The high scenic quality of the South Pennine moors has long been recognised. The southern section of this type lies partly within the Peak District National Park; and much of the land in the eastern part of this type lies within the area of the South Pennines that was identified in 1947 by the National Parks Committee as a potential AONB. Today, Pennine Prospects promotes the protection and regeneration of these landscapes, which are valued regionally as part of the non-statutory South Pennines Heritage Area.			■
Wildness and tranquillity Much of the area retains a relatively wild and tranquil upland character, due to its altitude and long views. In many areas it has a sense of remoteness and isolation due to its close associations with open moorland above. Locally, particularly close to settlement, wildness and tranquillity may be more limited.		■	
Natural and cultural heritage features There is extensive deep peat, and remaining unimproved areas of in-bye hay meadows and damp pastures are very valuable for nature conservation, supporting a rich and distinctive flora and fauna and important bird species including twite, curlew, lapwing and snipe. Numerous scheduled industrial features (eg Shedden Clough hushings east of Burnley) and Conservation Areas (eg Lumbutts and Mankinholes) underline the historic importance of the moorland fringes. There is fine vernacular architecture, including laithe houses and weavers' cottages of Millstone Grit.			■
Cultural associations The terraces provided the route for many ancient trackways including much of the Long Causeway from Burnley to Halifax and other routes for the transport of lime and salt as well as later packhorse ways associated with the expansion of the woollen trade. This landscape, in conjunction with that of the high moorland plateaux, was an inspiration for the poetry of the former Poet Laureate Ted Hughes. It is of high sensitivity in this regard.			■
Amenity and recreation Like the high moorland plateaux, this type is of considerable recreational value to nearby urban populations, its many panoramic views offering an outstanding landscape experience. The extensive rights of way network includes the route of much of the Pennine Bridleway, dramatic sections of the Pennine Way where it crosses the Calder valley, and other long distance recreational routes, including the Todmorden Centenary Way, Calderdale Way and Kirklees Way. There are popular Country Parks at Hollingworth Lake and Watergrove Reservoir.			■

Overall Sensitivity Assessment: High (locally Moderate-High)

This type is of high sensitivity over much of its area, due to its close relationship to the adjoining open moorland plateaux, as well as its small scale, complex land cover, wide visibility, high scenic quality, natural and cultural heritage features, and nationally or regionally important recreational interests.

Land of highest sensitivity generally occurs in the east, where the moorland fringes are associated with the main South Pennine ridge, The Calder valley and the Peak District National Park. Locally there are significant areas of lower (moderate-high) sensitivity, notably in the north-west, eg in the area east of Burnley, and in the south-east near Park Head. In these areas the landscape is somewhat larger in scale (more expansive, with larger enclosures) than elsewhere and is already affected by influences such as mining, quarrying, wind turbines, transmission lines and urban fringe land uses.

Landscape Character Type E: Rural Fringes

Location and Context

The rural fringes (classified as industrial foothills and valleys in the Lancashire Landscape Character Assessment) form the periphery of the South Pennines upland area. They lie below the moorland fringes/ upland pastures (type D) and occupy broad bands of land along the eastern dip slope and valleys near Huddersfield and Halifax as well as narrower bands along the western scarp slope near Burnley and south of the West Pennine Moors near Bury. The transition from the moorland fringes/ upland pastures is relatively gradual, mainly reflecting the growing influence of settlement that tends to occur at lower levels and towards urban edges.

Assessment Against the Landscape Sensitivity Criteria	Sensitivity Lower ↔ Higher		
Scale This is a relatively low-lying landscape surrounding the uplands at an elevation generally less than 250m and hence is small in terms of vertical scale. Forming a band around the edge of the uplands, the horizontal scale of this landscape is also limited due to its containment by the adjoining hills and urban edges and this tends to increase landscape sensitivity.			■
Landform The landform is gently sloping with relatively even gradients although local variations in topography create some areas of more complicated and hence more sensitive landform, for example in areas where the slopes are deeply incised by wooded valleys.		■	
Landcover These sheltered fringes are settled and farmed. Land cover patterns are small scale and relatively complex, and vegetation cover is varied. Small pastures are enclosed by gritstone walls or locally by hedgerows, and there is considerable tree and woodland cover. All these features tend to increase sensitivity.			■
Built environment Settlements include scattered farmhouses with large modern outbuildings, dispersed rural dwellings, and numerous hamlets and villages often with newer suburban infill and edge development. Vernacular styles and building materials characterise some areas but other areas are affected by out of town development associated with nearby urban centres, so landscape sensitivity is medium overall.		■	
Skylines and settings These peripheral landscapes tend not to form prominent skylines. Seen from settled valleys nearby, they are generally backclothed against the surrounding hills, reducing their sensitivity. However there are also some prominent landmarks, such as Castle Hill Fort south of Huddersfield, whose settings are highly vulnerable to any visual change.		■	
Visibility and views These landscapes, although often well-treed, are visible to large populations as they are fairly densely settled and close to major urban areas and important transport routes. In some areas they form key approaches to popular recreational areas, for example on the eastern edge of the Peak District National Park south-west of Huddersfield.			■
Landscape quality (condition) This type is a transition zone between the uplands and the urban edge. In recent years it has gradually become more urban in character through gradual encroachment of development and unsympathetic land uses. It is therefore of medium sensitivity.		■	

E: Rural Fringes (continued)			
Scenic quality Parts of this landscape have been recognised as being of scenic quality through inclusion in the South Pennines Heritage Area or the West Pennine Moors, which are non-statutory designations. Sensitivity in this regard is therefore medium at least.		■	
Wildness and tranquillity This is a sheltered, settled, 'domestic' landscape and therefore does not have a wild character. However large parts of the area – which is characterised by a dense network of narrow winding lanes – retain some relative tranquillity compared to the busy urban areas adjacent. .		■	
Natural and cultural heritage features There are some substantial areas of ancient woodland, particularly south of Huddersfield; and isolated remnants of species-rich grassland. Much of the land has a strong historic landscape character and there area some sites of note, such as Castle Hill Fort and sections of Roman road. Sensitivity is medium.		■	
Cultural associations There are no known cultural associations of note.	■		
Amenity and recreation This type is characterised by a dense network of public rights of way providing direct access to the countryside for nearby urban populations. Recreational use of countryside around towns is strongly promoted in both the South Pennines Heritage Area and the West Pennine Moors. This indicates some sensitivity.		■	

Overall Sensitivity Assessment: Moderate

Overall this type is of moderate sensitivity. Key constraints are its relatively small scale and extent; the intimacy and complexity of its landcover; and its densely settled character which makes it highly sensitive in visual and recreational amenity terms.

Locally there may be pockets of higher sensitivity associated with specific natural and cultural heritage interests; and areas of lower sensitivity, for example where the landscape has been affected by major out of town or industrial development.

Landscape Character Type F: Settled Valleys

Location and Context

The settled valleys lie within the deep valleys which cut through the high moorland of the South Pennines, including the valleys of the Irwell, Calder and Holme and their tributaries. The boundaries are generally formed by the enclosing view line from the valley floor.

Assessment Against the Landscape Sensitivity Criteria	Sensitivity Lower ↔ Higher		
Scale The deeply incised, narrow valleys that dissect the moors are one of the most distinctive landscape character types of the South Pennines. Parts of many of the main valleys are crowded by towns and urban areas, which originated at the point of a river crossing and expanded during the industrial age. The valleys are of limited width and small scale.			■
Landform The deep valleys are cut by rivers generally flowing in an easterly direction in Yorkshire and a southerly direction in Lancashire. The steep valley sides are typically 200m in height with a narrow valley floor; in some areas eg east of Todmorden the valley has been overdeepened and forms a gorge within and below the original U-shaped valley. This dramatic, distinctive landform is highly sensitive.			■
Landcover Landcover comprises urban land and underutilised farmland enclosed by gritstone walls as well as broadleaved woodlands, many of ancient origin, clinging to the steep valley sides and cloughs, particularly in the eastern parts of the area. There is considerable diversity and high sensitivity to disturbance.			■
Built environment Dense ribbons of urban and industrial development line the valley floors and sides. There are tightly-knit town centres with grand nineteenth century buildings, gritstone terraces of weavers' cottages, and mills whose distinctive chimneys dominate the urban skyline, as well as some more recent industrial and commercial development, the latter tending to reduce the sensitivity of the built environment in places.		■	
Skylines and settings Settlements are generally concentrated on south-facing slopes and along the valley floor; north-facing slopes tend to remain free of development. Skylines to the north therefore often feature settlement while those to the south, even within urban areas, may be clothed by in-bye pastures and woodlands. Both are highly complex and sensitive. The dramatic slopes and gorges often provide very attractive settings for the towns.			■
Visibility and views These landscapes are contained and not widely visible, except from the hillsides immediately above. From within the area, views are often contained by buildings and other structures but there may also be fine outward views to the pastures, woodlands and moorland edge above.	■		
Landscape quality (condition) Landscape quality is mixed. The distinctive pattern of settlement and valley side woodland is often relatively intact but the characteristic field patterns on the valley sides, as well as industrial heritage features such as millponds and races, may be in need of repair and maintenance, or may be disrupted or fragmented by more recent urban development.		■	

F: Settled Valleys (continued)			
Scenic quality These distinctive landscapes have a dramatic and appealing landscape setting and an important industrial heritage. Much of the area has been recognised as being of scenic quality through inclusion in the non-statutory South Pennines Heritage Area. Sensitivity in this regard is therefore medium at least, notwithstanding the settled character.		■	
Wildness and tranquillity There is little sense of wildness, with most of the valleys being occupied by urban development and transport corridors. However the valley sides, with their wooded character, often retain a sense of tranquillity and timelessness.		■	
Natural and cultural heritage features Key natural and cultural heritage features include broadleaved woodland, much of ancient origin; valley wetland habitats including rivers, fens and wet pastures; in-bye pastures and hay meadows on the valley sides; distinctive vernacular architecture including mills, packhorse bridges and weavers' cottages; and a wealth of historical and archaeological interest. There is a special concentration of listed building and structures and Conservation Areas within the valleys.			■
Cultural associations The South Pennines is generally seen as the seat of the Industrial Revolution. The landscapes generated by the process of industrialisation are one of the special and significant features of the South Pennines, and are focused within the settled valleys. They include the railways and canals; the very distinctive architecture of the textile industry; and the grand civic buildings of towns such as Hebden Bridge, built on the wealth generated by the textile industry. The historic town of Holmfirth, south of Huddersfield, was the setting for the popular television series 'Last of the Summer Wine'.			■
Amenity and recreation Within the settled valleys, amenity and recreational interest is generally associated with the area's industrial heritage, canals, and canal and riverside walkways such as those along the Rochdale Canal and the Holme valley.		■	

Overall Sensitivity Assessment: Moderate-High

The sensitivity of this landscape character type to wind energy development is moderate-high overall. Key constraints are the landscape's limited width and extent, its tight enclosure by landform (which also adversely affects the wind resource), the diverse landcover and skylines; and the wealth of cultural heritage interest associated with the early industrialisation.

Sensitivity is especially high within and close to the many Conservation Areas and important built heritage features. Locally there are pockets of somewhat lower sensitivity associated with recent industrial and commercial development, particularly in the larger towns.

Landscape Character Type G: Wooded Rural Valleys

Location and Context

These incised wooded valleys are secluded tributaries of the Rivers Irwell, Roch, Calder, Holme and Dearne. They occur in the south-west, central and south-east parts of the study area. They differ from the settled valleys (type F) in that they are generally less developed and more rural in character.

Assessment Against the Landscape Sensitivity Criteria	Sensitivity Lower ↔ Higher		
Scale These steep-sided, wooded valleys have a secluded, intimate character derived from abundant woodland which clothes the valley sides, often blocking the sky from view. Although some areas are relatively large in extent, the experience is of a small scale, enclosed landscape.			■
Landform The valleys are incised, with distinctive stepped terraces and narrow valley floors. The swift-flowing streams often tumble over hard gritstone rocks. Local areas of landslip on the valley sides may create a distinctive hummocky topography, and waterfalls are a characteristic feature, especially in the Calder valley, where overdeepening has occurred.			■
Landcover The main landcover elements are meadows and marsh in the valley floors; thick broadleaved woodland (often ancient in origin) on the steep valley bluffs; and small enclosed pastures enclosed by gritstone walls on the flatter land above. This diverse landcover pattern is very sensitive to physical disturbance.			■
Built environment The main built environment features of this type are remnant industrial features such as derelict water mills, ponds and races along the valley floor, reflecting the emergence of early industrialisation. Although modern built development occurs nearby, it has limited influence on these enclosed, wooded landscapes.			■
Skylines and settings Locally the wooded rural valleys may provide a key part of the landscape settings of towns such as Prestwich, Heywood, Hebden Bridge, Halifax and Huddersfield, their woodlands contributing a distinctive landscape framework and skyline.		■	
Visibility and views These landscapes tend to be visually contained by woodland and topography and hence not widely visible, although they can be seen from facing valley slopes. There are also relatively few outward views due to the steep enclosing topography and dense woodlands.		■	
Landscape quality (condition) The landscape quality of this type is relatively good, although there are issues relating to woodland management and regeneration, conservation of historic built features and urban fringe pressures such as flytipping in some areas.		■	
Scenic quality Scenic quality is relatively high, much of the area being included in the non-statutory South Pennines Heritage Area. This type typically provides pockets of unspoilt, dramatic, riverside landscape, with an important woodland structure and historical continuity. These areas are highly valued locally.		■	

G: Wooded Rural Valleys (continued)			
Wildness and tranquillity This landscape is not wild but is often relatively tranquil due to its undeveloped, rural character, strong woodland cover, and that fact that many of the valleys are largely hidden and accessible only on foot.		■	
Natural and cultural heritage features Most of the woodlands within this landscape character type are ancient in origin and on the valley floors there is a valuable mosaic of wetland habitats including freshwater streams and springs, damp pasture, meadows and marsh. Archaeological features related to woodland management, such as charcoal hearths, are common and the many water mill sites are of historic interest.		■	
Cultural associations This area has a particular association with early industrial activity, as evidenced by remnants of charcoal burning and water mills, the swift streams having provided a source of water power. .		■	
Amenity and recreation The valleys are important local landscapes and are well used for recreation, providing attractive footpath routes linking the valley settlements to the upland pastures and high moorland, particularly in The Calder valley. Some of the woodlands are also Country Parks eg Prestwich Forest Park.		■	
Overall Sensitivity Assessment: Moderate-High This landscape type is of moderate-high sensitivity to wind energy development. In practice wind energy development would be very difficult to accommodate due to the landscape's enclosure by topography and woodland (and its limited wind resource). The landscape's considerable scenic quality, natural and cultural heritage interest and amenity and recreation value are also key constraints. Almost all of the landscape is of relatively high sensitivity, although there may be very small pockets of lower sensitivity associated with existing development or infrastructure.			

Landscape Character Type I: Reservoir Valleys

Location and Context

Some of the valleys emerging from the West Pennine Moors have been flooded to form water supply reservoirs which, unlike other upland fringe reservoirs within the study area, are enclosed by coniferous plantations. This type occurs in the area around Haslingden Grane, west of Haslingden.

Assessment Against the Landscape Sensitivity Criteria	Sensitivity Lower ↔ Higher		
Scale This valley landscape has an open profile and large expanses of open water. The valley bottom lies at around 200m AOD while the surrounding hills rise to around 350m AOD. The landscape is of medium sensitivity in respect of scale.		■	
Landform The reservoir valleys have a more open topography than the deeply incised valleys of the central part of the Pennines. The glaciated valley form is relatively smooth and flowing. The engineered dams and embankments are distinctive features.		■	
Landcover Large water bodies dominate much of the valley floor. The valley sides are clothed in substantial areas of coniferous and mixed plantation and in small, strongly patterned, walled enclosures.		■	
Built environment There is generally little settlement today, and few contemporary built structures. The reservoirs themselves represent an important historic landscape element and engineering feat, with features such as gothic towers and crenellations, bridges, spillways, embankments and tunnels that are of historic interest.		■	
Skylines and settings The landscape character type is generally contained within the valley, so there are few important skylines. The eastern end of the valley forms part of the landscape setting of Haslingden, which lies immediately to the east.		■	
Visibility and views The valley is the focal point of views from the surrounding moors and from the Rossendale Way and is highly sensitive in this respect. Clough Head visitor centre is an important viewing point within the valley, and the Grane as a whole is a popular walking destination.			■
Landscape quality (condition) Landscape condition is relatively good although locally there are issues associated with the repair of stone walls, felling and replanting of plantations, and restoration of former quarrying sites.		■	
Scenic quality The area around Haslingden Grane, including Fairy Glen, is a local beauty spot, sometimes referred to as 'Little Scotland'. The area is part of the West Pennine Moors, which are recognised for their scenic quality. The West Pennine Moors Partnership works to conserve and enhance the area's landscape character and natural and historic assets, sustain rural communities, and contribute to the well-being of adjoining urban communities.			■

I: Reservoir Valleys (continued)			
Wildness and tranquillity The entire valley was depopulated when the reservoirs were constructed. Today it has a sense of desolation, due to the presence of abandoned farmsteads and ruined cottages. The valley's relative remoteness and absence of settlement and the presence of woodlands and bird life associated with the reservoirs lend some sense of wildness and tranquillity.		■	
Natural and cultural heritage features The reservoirs support important populations of wintering wildfowl and waders. There are a number of historic features of interest, associated with the area's history of farming, quarrying and milling.		■	
Cultural associations The principal cultural association is with the building of the reservoirs, which involved flooding of settlements within the valley.	■		
Amenity and recreation This type includes Clough Head Visitor Centre and the Helmshore Mill Textile Museum lies on its eastern edge. The Grane is gradually being discovered by visitors and is increasingly used for recreation with car parks and footpath links being established, especially around Calf Hay Reservoir.			■

Overall Sensitivity Assessment: Moderate-High

The sensitivity of this small area is moderate-high overall. In practice significant wind energy development would probably be difficult to accommodate due to the landscape's limited extent and valley character. Other key constraints are the area's locally high visibility, scenic quality and popularity as a recreational resource.

Almost all of the landscape is of relatively high sensitivity, although there may be small pockets of lower sensitivity associated with existing development or infrastructure such as the water supply reservoirs.

Landscape Character Type K: Coalfield Edge Urban Fringe Farmland

Location and Context

This landscape character type comprises the area of transition between the high moorlands of the South Pennines and the extensive urban conurbations of West Yorkshire to the east. Here the long dip slope gradually descends eastwards as undulating ridges separated by wooded rural valleys (type G).

Assessment Against the Landscape Sensitivity Criteria	Sensitivity Lower ↔ Higher		
Scale This is a series of fairly broad intermediate ridges, descending from around 400m AOD in the north-west to around 100m AOD near the Calder valley in the south-east. The landscape is expansive in scale and gently domed on the higher ground. On lower ground the landscape becomes smaller in scale and extent, as it is subdivided by river valleys.		■	
Landform The long eastern dip slope of the South Pennines descends from the high moorland of Ovenden Moor. The geology is dominated by Coal Measures rather than Millstone Grit, creating a lower, more undulating landform than areas to the west, dissected by relatively shallow valleys. Otherwise there are few notable landform features. Sensitivity is medium.		■	
Landcover Fields of pasture, often larger and more regular than is typical elsewhere in the South Pennines, are enclosed by stone walls and represent relatively recent parliamentary enclosures. However, as these walls are one of the few unifying characteristics with the wider South Pennines landscape, sensitivity is medium.		■	
Built environment Human influence is considerable and includes a high density and visibility of pylons, roads and scattered piecemeal development along the ridgelines. Landfill and other urban fringe land uses such as horse paddocks, plant hire, salvage and storage, are often evident. In contrast with other parts of the South Pennines, settlement occurs in hilltop locations and may include extensive, relatively recent suburban development around more historic cores.	■		
Skylines and settings The landscape forms part of the northern and eastern skyline of Halifax and the southern and western skyline of Bradford, but is not of the highest sensitivity, given its relatively developed character.	■		
Visibility and views This landscape is widely visible from settlements within the area and from surrounding countryside and towns, particularly to the north, east and south. There are long views across the wooded rural valleys, but also longer views across the urban and industrial areas of Bradford, Halifax, Brighouse and the M62. This tends to strengthen the urban and industrial influence on this landscape and reduce visual sensitivity, which might otherwise be high.		■	
Landscape quality (condition) In many areas the walls are in a poor state of repair and in places they have been replaced by post and wire fencing. This sense of decline is compounded by the presence of urban fringe influences as described above. However there are also intact pockets of higher quality rural parkland landscape.		■	

K: Coalfield Edge Urban Fringe Farmland (continued)			
Scenic quality Scenic quality is not exceptional, any local scenic interest being focused in the adjoining wooded rural valleys. Most of the area lies outside the South Pennines Heritage Area.	■		
Wildness and tranquillity There is relatively little sense of either wildness or tranquillity, except perhaps on the highest ground to the north, which has an expansive character and offers long, windswept views.	■		
Natural and cultural heritage features Some of the higher ground in the north-west is underlain by deep peat; fragments of species-rich grassland remain within the mainly improved agricultural land; and there are scattered remnants of ancient woodland. The intensive use and management of this area, through both farming and development, has largely obliterated early archaeological and historical evidence, although the area retains some vernacular buildings of interest.	■		
Cultural associations There are no known cultural associations of note.	■		
Amenity and recreation A number of long distance recreational routes including the Calderdale Way, Brontë Way and Kirklees Way take advantage of the high level views that this area affords; and there is a relatively dense network of public rights of way providing countryside access for nearby urban populations. Recreational sensitivity is therefore fairly high. .			■

Overall Sensitivity Assessment: Moderate-Low

The landscape sensitivity to wind energy development of this type is generally moderate-low due to its relatively large scale landform, the presence of existing intrusive influences that have eroded countryside character and quality, and the absence of notable natural or cultural heritage interests.

Locally there may be areas of higher sensitivity, particularly where there are intact enclosure patterns or parkland; where the landscape is viewed at close range from settlements; and where there are high levels of recreational use of public rights of way. Land of lower sensitivity is most likely to occur in the more sparsely settled parts of the area.

Landscape Character Type L: Lowland Farmland

Location and Context

This landscape character type can be found in the south-western fringes of the South Pennines around Bury and Rochdale. These are relatively low-lying, agricultural landscapes that have been heavily fragmented by transport infrastructure, including the M62 and other motorway corridors.

Assessment Against the Landscape Sensitivity Criteria	Sensitivity Lower ↔ Higher		
Scale These landscapes are expansive and gently rolling, with a generally open character. They are of limited vertical scale, but their horizontal scale is relatively large, except where disrupted by development and transport corridors. Some areas are entirely enclosed by settlement and are therefore of smaller scale.		■	
Landform These are undulating landscapes that range in elevation from 90 to 140m AOD. Deposits of glacial till and peat, as well as small river corridors, give rise to local variations in landform although the overall impression is of a fairly uniform lowland landform, particularly in the central section of this landscape character type.		■	
Landcover Semi-natural woodlands along motorway corridors and on former mosses provide subdivision and enclosure in an otherwise relatively open landscape of medium or large-sized pasture and arable fields enclosed by hedgerows and fences. Locally on the southern edges of the area, eg at Hopwood Hall, there are areas of parkland.		■	
Built environment Settlement is sparse, comprising dispersed farmsteads. There are some areas of industrial development; urban fringe land uses such as equestrian facilities and golf courses, and a number of major transport corridors. Overall there is a high degree of human influence, which tends to reduce landscape sensitivity.	■		
Skylines and settings This land, due to its relatively low-lying nature, is seldom seen as a skyline feature. However the land forms the southern countryside setting to Heywood and Rochdale and the northern setting to Prestwich and Middleton and is of some sensitivity in this respect.		■	
Visibility and views There is strong visual connectivity to adjoining uplands even though these are relatively distant. The area is also very visible from the edges of nearby settlements and from the M6 and other transport corridors. Sensitivity is medium given the existing degree of human influence in the landscape and the fact that motorway users are not very sensitive receptors.		■	
Landscape quality (condition) Landscape quality is fair, locally poor. The intensively farmed agricultural landscapes are affected by urban fringe influences; and field boundary condition is variable. Fragmentation of farmland by built development also adversely affects landscape quality.	■		

L: Lowland Farmland (continued)			
Scenic quality This type is of limited scenic quality or visual appeal, except locally where parkland landscapes may provide some scenic interest.	■		
Wildness and tranquillity This is generally not a wild or tranquil landscape, although it does provide areas of some relative tranquillity close to adjoining urban edges.	■		
Natural and cultural heritage features There are small remnant areas of deep peat north of Birch Moss Services and fragments of ancient woodland around Hopwood Hall, where there is also a nature reserve. Small streams and ponds and evidence of medieval settlement provide local interest.	■		
Cultural associations There are no known cultural associations of note.	■		
Amenity and recreation Amenity and recreation interests are relatively limited, although there is reasonable public rights of way network, including a section of the Rochdale Way, and a number of golf courses.	■		

Overall Sensitivity Assessment: Moderate-Low

This type is of relatively low sensitivity to wind energy development, as it is heavily influenced by the presence of major infrastructure corridors as well as other human influences and its landscape quality is only fair. Most features of scenic, heritage or recreational value are generally of local interest only.

The area of lowest sensitivity overall is the central section, north of the M62/M60 motorway junction. Land of higher sensitivity occurs on the eastern outskirts of area, between Middleton and Rochdale, which is more varied topographically and has some parkland and other heritage features of interest.

Landscape Character Type M: Industrial Lowland Valleys

Location and Context

These valley landscapes are located on the south-western fringes and eastern fringes of the South Pennines, along the Irwell and Calder valleys respectively, in areas where there is a long history of major industrial development.

Assessment Against the Landscape Sensitivity Criteria	Sensitivity Lower ↔ Higher		
Scale This is a relatively small scale landscape in terms of extent. It is generally contained within the river corridor and frequently enclosed by wooded bluffs or built development, which may heighten sensitivity to wind energy development. However where existing industry is large scale, sensitivity may be reduced.		■	
Landform These landscapes are located beyond the upland edge, where the river valleys broaden, a distinct floodplain emerges, and the surrounding land is lower-lying. The edges of the floodplain may be defined by distinctive, low, steep bluffs. In some areas landform has been extensively modified.		■	
Landcover In many areas the valley floor has been developed, frequently by industry which may obscure the valley floor and the course of the river. Elsewhere there may be remnants patches of open space, agriculture, woodland, scrub, or more extensive areas of active or disused quarrying or landfill. In general landcover is not sensitive to change.	■		
Built environment Large industrial units, quarrying and landfill and major transport infrastructure including roads, railways and canals, have extensively modified this landscape, so sensitivity is low.	■		
Skylines and settings This land is seldom seen as a skyline feature. However some of the built structures within it, including mills, industrial plant and large warehouses, as well as surrounding urban development, may form distinctive skyline features. Skyline sensitivity is rarely high (except where buildings are of historic importance), but the 'fit' of turbines with existing structures may be a key issue.		■	
Visibility and views These river valley landscapes are generally highly visible from surrounding areas, particularly from higher ground. However views are seldom sensitive given their existing developed character.	■		
Landscape quality (condition) Landscape quality within these areas has improved immensely in recent years as a result of urban and industrial regeneration and environmental improvement. However there are relatively few original landscape patterns or features that are sensitive to disturbance or require conservation.	■		
Scenic quality This landscape is seldom of any special scenic quality although locally the river corridor may have some scenic interest, for example where there are wooded bluffs or water features with visual appeal.	■		

M: Industrial Lowland Valleys (continued)			
Wildness and tranquillity This landscape generally has little or no wildness or tranquillity, retaining few natural features and being located within busy industrial and urban areas.	■		
Natural and cultural heritage features Locally broadleaved woodland and scrub areas may be of nature conservation interest. Some valley-side woodlands in the Calder valley near Brighouse are ancient in origin. Parts of this landscape may also have a distinctive vernacular in the form of old mill buildings, canals and bridges, and other industrial heritage.		■	
Cultural associations Like the settled valleys, this landscape character type has strong associations with industrialisation, but early industrial influences have frequently been overlain here by more recent large scale heavy industry and major infrastructure, reducing sensitivity.		■	
Amenity and recreation This type tends to have limited recreational interest or appeal although there are watersports facilities within the Calder valley at Brighouse. Riverside access is generally limited apart from unconnected sections of public footpath and in the Irwell valley short sections of the Irwell Sculpture Trail and the Calderdale Way.	■		

Overall Sensitivity Assessment: Moderate-Low

This type is of relatively low sensitivity to wind energy development, as it is heavily modified by human influence, including large contemporary industrial and transport structures. The type retains few original landscape patterns or features, and has little or no wildness, tranquillity or amenity and recreation interest.

The areas of lowest sensitivity are those that have been most heavily modified or influenced by contemporary development. Locally there are areas of higher sensitivity associated with industrial and civic buildings of historic importance; natural heritage features such as ancient woodlands; and specific recreational interests. For example, the river corridor west of Brighouse is more sensitive for these reasons.

Landscape Character Type N: Rolling Wooded Farmland

Location and Context

This landscape character type occurs in the east of the study area. Here alternating bands of shale and sandstone, with frequent coal seams, form an area of elevated, rolling countryside extending from near Dewsbury in the north to south of Denby Dale.

Assessment Against the Landscape Sensitivity Criteria	Sensitivity Lower ↔ Higher		
Scale This is a relatively large scale landscape in terms of landform, with an extensive rolling character. Scale is reduced somewhat by the fact that the area is enclosed, but the enclosures too are medium or large in scale.	■		
Landform The rolling landform of this area rises to around 270m AOD at Emley Moor, with a second somewhat lower summit at Pool Hill near Denby Dale. It has a gently domed, convex form overall, suggesting relatively low sensitivity. Slopes are generally steeper on the west and gentler on the east.	■		
Landcover Landcover is fairly diverse, comprising medium to large fields of arable land and pasture, enclosed by hedgerows. Smaller, earlier enclosures occur on valley sides and around settlements, while higher ground has larger, later, more regular enclosures of former moorland commons. There are also significant blocks of woodland, shelterbelts and hedgerow trees, creating a well-wooded character in parts.		■	
Built environment There is a dispersed pattern of farmsteads, with some larger (former colliery) settlements such as Skelmanthorpe. Although these have historic cores, today they mainly comprise extensive modern suburbs as well as some industrial and business park development.	■		
Skylines and settings These domed uplands form an important skyline east of Huddersfield. The area is dominated by the Emley Moor TV Tower (330m) which is a notable landmark from all directions. Its presence makes the skyline highly sensitive to any new structure which might conflict visually.			■
Visibility and views This area is widely visible, particularly from Huddersfield and the moorland fringes to the west, but also from other directions. Views tend to focus on Emley Moor TV tower, which draws the eye. The area is less visible from the adjoining valleys, where the incised, wooded valley sides and the convex form of the slopes above tend to block views to the elevated land above.		■	
Landscape quality (condition) Landscape quality is mixed. Some areas are in relatively good condition, but in other areas landscape patterns are affected by hedgerow removal, large farm buildings, urban fringe and industrial influences.		■	
Scenic quality Attractive patterns of woodland and undulating topography give parts of this area some scenic quality, often associated with minor parklands and designed landscapes, especially in the north. The fine panoramic views from high ground also lend some visual appeal in parts.		■	

N: Industrial Lowland Valleys (continued)			
Wildness and tranquillity This landscape has some wildness on its open, exposed tops. It is also relatively tranquil in parts. However neither quality is particularly strongly expressed, as the landscape is enclosed and settled, and other human influences such as the TV tower are widely visible.	■		
Natural and cultural heritage features Roadside verges are species-rich and some woodlands are ancient in origin, particularly on the eastern and south-eastern edges of the area. There are early iron workings nearby in the vicinity of Emley Woodhouse and these form distinctive landscape features. Part of Bretton Park, a registered park and garden, lies at the study area's south-east corner.		■	
Cultural associations The area has a strong cultural identity related to its history of coal mining and iron-working; but otherwise there are no known cultural associations of note.	■		
Amenity and recreation There is a relatively sparse rights of way network, mainly concentrated on the lower slopes. The Kirklees Way runs across the southern and eastern fringes of the area. The Kirklees Light Railway is a local attraction, running east from Huddersfield to Clayton West.	■		
Overall Sensitivity Assessment: Moderate-Low This type is of moderate-low sensitivity to wind energy development. Its landscape scale, landform, and built environment character all suggest low sensitivity, but it is more sensitive in terms of skylines and visibility, with Emley Moor TV Tower potentially forming a key visual constraint. The areas of lowest sensitivity are the open hillsides away from the TV tower, particularly to the north and east in areas where slopes are gentler, enclosures larger and the landscape more sparsely settled. Proximity to the steeper slopes that occur to the west and to the south above the Dearne valley may heighten sensitivity, as may proximity to settlements and attractive wooded valley landscapes.			

Landscape Character Type O: Industrial/ Business Parks

Location and Context

This type occurs on the outskirts of Burnley in the north-west, around Batley and Dewsbury in the north-east, and on the southern outskirts of Rochdale and Heywood. Unlike the industrial lowland valleys type (type M), these are smaller areas, usually in an urban or urban fringe location.

Assessment Against the Landscape Sensitivity Criteria	Sensitivity Lower ↔ Higher		
Scale This type comprises relatively small, intensively developed areas of land, usually in an urban or urban fringe location. Space is limited in urban areas but at the urban fringe there may be a greater sense of space. Buildings are often large in scale.		■	
Landform Landform varies and is often heavily modified but generally fairly flat. Where this type occurs at the urban fringe it may be set on rising ground eg south of Burnley and north of Batley.	■		
Landcover Built form and hard standing are the principal form of landcover and sensitivity is generally low.	■		
Built environment Most of these areas comprise large modern industrial, business or commercial sheds or distribution buildings, although there are also some older stone or brick-built works and mills. Many areas abut major road or rail corridors. Sensitivity tends to be low unless buildings are of historic interest.	■		
Skylines and settings Buildings and structures in these areas may form existing skyline features. Skyline sensitivity is rarely high (except where buildings are of historic importance or form key landmarks), but the 'fit' of turbines with existing structures may be a key issue.		■	
Visibility and views These areas are often widely visible, their visibility heightened by the presence of existing large buildings and structures and urban fringe or elevated locations. However they tend not to form part of valued countryside views.		■	
Landscape quality (condition) Landscape quality may be good where industrial or business parks have been well-designed and maintained. However there are relatively few original landscape patterns or features that are sensitive to disturbance or require conservation.	■		
Scenic quality Scenic quality is generally low.	■		
Wildness and tranquillity These areas have little or no wildness or tranquillity.	■		

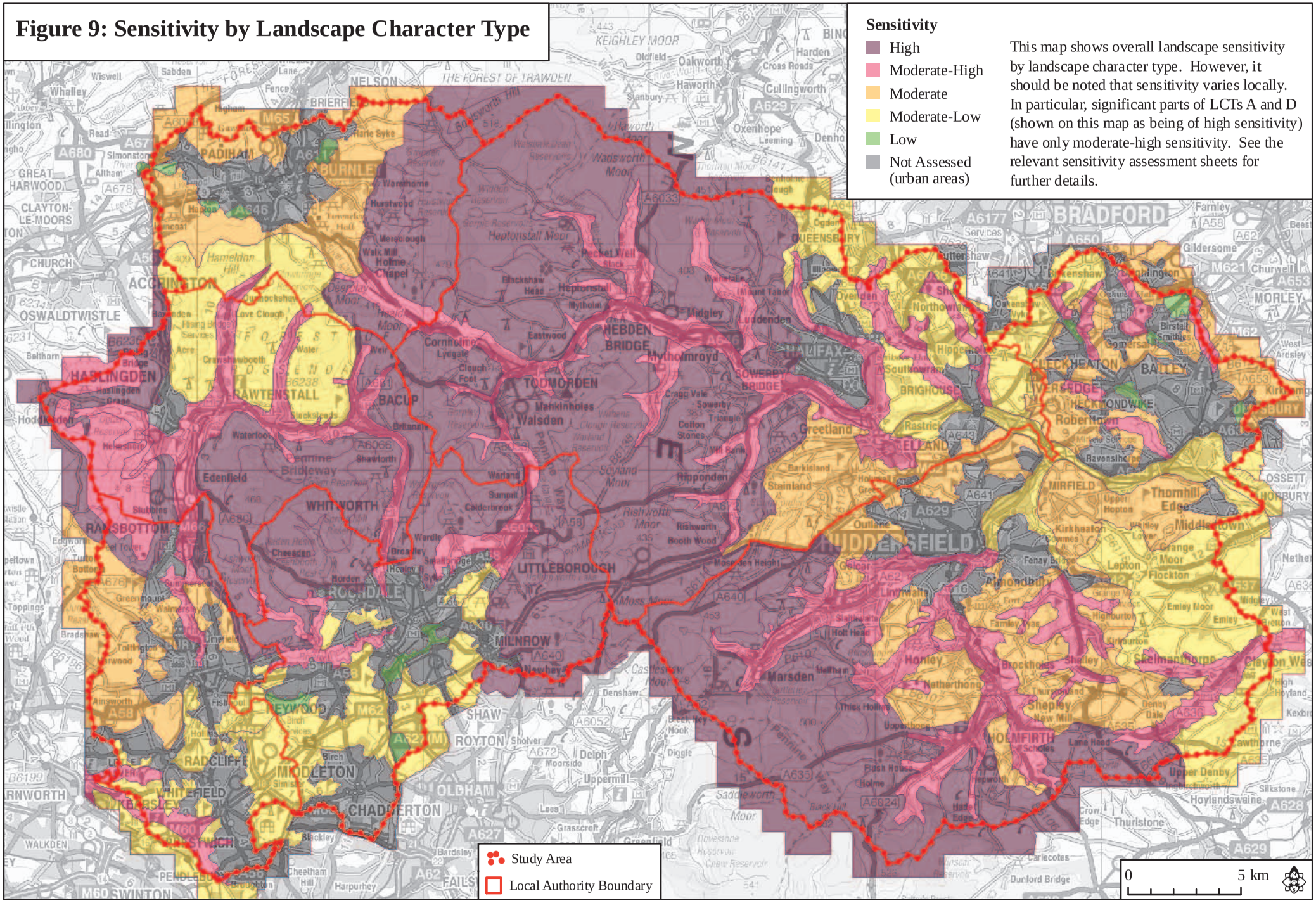
O: Industrial/ Business Parks (continued)			
Natural and cultural heritage features In general these areas do not contain natural or cultural heritage features.	■		
Cultural associations There are no known cultural associations of note.	■		
Amenity and recreation These areas are of little or no amenity or recreation interest.	■		

Overall Sensitivity Assessment: Low

The industrial/ business park landscapes are of low sensitivity overall, being mainly built up and already characterised by large, modern, man-made structures. Any landscape constraints on wind energy development will generally relate to the impacts on adjoining landscape character types.

Although almost all areas are of relatively low sensitivity, locally sensitivity may be heightened by specific issues, particularly impacts on skylines, historic built environment and the visual amenity of nearby residents.

Figure 9: Sensitivity by Landscape Character Type



5.3 Capacity Assessment Sheets

For each CA, an assessment of landscape capacity for wind energy development was prepared and is set out below.

The general assumption is that areas of lower sensitivity are more likely to be able to accommodate wind energy development than areas of higher sensitivity. However it is recognised that, ultimately, capacity will also be affected by other factors, including technical feasibility and perceptions of the need for development, which are not considered in this study.

The capacity assessment was based on careful consideration of location, context and intervisibility; review of the relevant sensitivity assessments for constituent LCTs; and systematic appraisal of issues of fit with landscape character, scale of wind energy development, and potential cumulative impacts across the CA, presented under headings of constraints, opportunities, guidance and cumulative and cross-district issues. Wind speeds were not explicitly taken into account in the assessment; but where it appeared that low wind speeds (less than 6m/s) might limit an area's potential for wind energy development this was noted.

The assessment includes a summary of overall capacity (including any existing wind energy development) and a statement relating to thresholds of landscape change overall. Unless otherwise stated, it can be assumed that all CAs may also have capacity to accommodate single very small turbines in appropriate locations, provided that constraints are respected and guidance followed.

For further information on the approach and principles that were applied in preparing the capacity assessment (including the wind energy development types that are referred to in the capacity assessment sheets), please refer to *Sections 2.4-2.5.*

The capacity assessment sheets do not repeat the full sensitivity assessments given in the sensitivity assessment sheets, so again please note that both the sensitivity assessment and the capacity assessment for a given location should be read together when considering any specific development site or proposal.

Capacity Area 1: Burnley

Location and Context

The Burnley capacity area comprises valley and foothill land of types E: Rural Fringes and O: Industrial/ Business Parks (around the western, southern and eastern edges of Burnley), as well as the urban areas of Burnley itself. The area focuses on the broad valley of the Lancashire River Calder and is ringed by the uplands of Hameldon Hill and the Forest of Rossendale to the south, the South Pennines and Forest of Trawden to the east, and Pendle Hill to the north-west (outside the study area). It comprises land rising to the moorland line (at around 300m AOD) to the south, while to the east its edge generally follows a more complex lowland to upland transition that occurs at around 200m AOD. In this latter area the landscape is deeply incised by a series of wooded valleys. There is an existing small group of turbines (3 turbines 90m high) on the southern edge of the area.

Intervisibility

Visually the landscape is perceived as a bowl. The principal views are from the built up areas of Padiham and Burnley; from the M65, which runs south-west to north-east across the area; from the A56, A682 and A671 which cross the uplands to the south; and from surrounding hills on walking routes including the Burnley Way and the east-west Pendle Way and Brontë Way. There are longer views into the area from the north and west (from Pendle Hill, part of the Forest of Bowland AONB), but to the south most views into the area are contained by the east-west ridge of high ground that includes Hameldon Hill.

Capacity Assessment

Constraints

The southern and eastern edges of this area fulfil a strategic landscape and recreational role, providing a green wedge of open countryside between the peripheral industrial estates on the edges of Burnley and the surrounding hills. They include the extensive area of historic parkland at Towneley Park south-east of Burnley, as well as the series of incised wooded valleys to the east of the town, which are well-used for recreation. There is also sensitive historic parkland landscape north of Burnley around Gawthorpe Hall.

Opportunities

There is relatively little space (and limited wind resource) within this capacity area for significant new wind energy development. The principal opportunity is for some further development in the vicinity of the existing Hameldon Hill wind farm, up to the size of an additional small group of turbines. Theoretically there should also be scope for single turbines or small groups of turbines associated with the industrial/ business park land (type O) on the western, southern and eastern edges of Burnley. In practice however the latter opportunities are likely to be constrained by proximity to the Hameldon Hill site and by the need to conserve the green wedge on the south side of Burnley (see below).

Guidance

When siting any new wind energy development near the Hameldon Hill wind farm site, care should be taken to ensure that the turbines form a compact cluster with existing turbines. Turbines should be sited (as existing turbines are) so that they generally do not break the skyline when viewed from the north and should be of consistent layout, height and design to existing turbines. On industrial/business parks sites any turbines should be relatively small and carefully sited relative to existing structures. Potential visual conflicts with Hameldon Hill or with the many transmission lines in this area (eg south of Padiham) should be avoided. Special attention should be paid in all cases to impacts on views from Pendle Hill (part of the Forest of Bowland AONB) to the north.

Cumulative and cross-district issues

Most of this area has views of the existing wind farm at Hameldon Hill; the wind farm at Coal Clough is also theoretically visible in the eastern and northern parts of the area. As noted earlier, development of new wind energy sites on the southern edge of Burnley could give rise to significant cumulative effects with development at Hameldon Hill (just 1-2km away), hence should be avoided.

Overall capacity

This area may have landscape capacity for the following (including the existing Hameldon Hill development):

- two small groups of turbines or a single small wind farm with turbines of medium height (in the vicinity of the Hameldon Hill site);
- several single turbines or small groups of carefully sited very small or small turbines in industrial /business park locations.

This area is currently part of a 'landscape with occasional wind farms' and following these developments is likely to remain a 'landscape with occasional wind farms', representing a landscape strategy of accommodation.

Capacity Area 2: West Pennine Moors

Location and Context

A small portion of the West Pennine Moors upland block lies within the study area west of the deeply incised Irwell valley. The area comprises the eastern parts of Holcombe and Oswaldtwistle Moors, separated by the deep glaciated valley of Haslingden Grane, together with the enclosed and settled fringes and valleys to the east and urban land at Haslingden and Ramsbottom on the M66 and A56. The principal landscape character types are B: Moorland Hills, D: Moorland Fringes/ Upland Pastures and I: Reservoir Valleys. The moors rise to just over 400m and have simple, broad, rounded tops but also steep, sharp, eastern edges. There is no existing wind energy development at present.

Intervisibility

The edges of these moors are very visible at close range from the valleys to the east, for which they form the immediate skyline; the moorland tops however are not visible from the valley bottoms, being screened by intervening topography. In more distant lowland views from the south and east, towards Bury, the moors as a whole are clearly visible, Holcombe Moor in particular forming a prominent landmark. Oswaldtwistle Moor in the north forms part of the southern skyline of Accrington (outside the study area). From the adjoining uplands to the east at Scout Moor and Cribden Hill, there are open views across these moorland tops. Equally there are views across the area from further west within the West Pennine Moors.

Capacity Assessment

Constraints

The key constraints to wind energy development in this area are the prominent gritstone scarps on the eastern upland edge, which are highly exposed to view from nearby settlements and very sensitive in this respect, also forming the setting to Peel Tower and Holcombe Conservation Area towards the south. The moorland tops are covered in deep peat and blanket bog that is vulnerable to physical disturbance, as are the wooded cloughs that occur on the slopes below the moors. The reservoirs, Fairy Glen and visitor centre at Clough Head are popular recreational resources, as is the Rossendale Way which runs all around the moorland fringes. Part of Holcombe Moor is an MOD rifle range.

Opportunities

The principal landscape opportunities for wind energy development occur on the higher ground of the moorland hills landscape (type B) on the edges of the study area north and south of Haslingden Grane. Here there are areas of smooth landform and consistent ground cover that are well set back from the visually exposed gritstone edges. The scale and extent of the areas concerned suggest possible capacity to accommodate a medium wind farm, subject to consideration of cumulative impacts with any sites outside the study area.

Guidance

Analysis of landform suggests that any wind farm development should be set back at least 400m from the steep scarp edges to minimise impacts on settlements below and on the Rossendale Way which follows the scarp. Siting on or near distinctive knolls such as Tor Hill and Bull Hill should be avoided. A linear turbine layout may fit best with the form of the ridge; layout should also take account of impacts on key views from within the West Pennine Moors to the west. Care should be taken in micrositing to minimise effects on areas of deep peat and potential archaeological interest. Existing access tracks should be utilised where possible to help prevent damage to moorland fabric and other features such as wooded cloughs and stone wall enclosures; appropriate restoration is essential. Grid connections should be underground. Medium or even large turbines may be acceptable, subject to detailed assessment of height in relation to landform.

Cumulative and cross-district issues

Any wind energy development within or adjacent to this area would have the effect of extending the influence of wind energy development over a wider area of the South Pennines, as it is likely to lie within around 7-9km of the nearest existing wind farm at Scout Moor. If wind energy development were to take place at Hyndburn (just outside the study area), it is unlikely that there would be any further capacity for wind energy development in the northern part of this capacity area, although some capacity might remain to the south.

Overall capacity
This area may have landscape capacity for the following:

- one medium wind farm, with turbines of medium or large height.

This landscape is currently part of a wider 'landscape with no wind farms or infrequent wind farms' within the West Pennine Moors as a whole. Following this development it is likely to become a 'landscape with occasional wind farms', crossing a threshold from a landscape strategy of conservation to one of accommodation.

Capacity Area 3: Forest of Rossendale

Location and Context

The Forest of Rossendale is an unusual, enclosed upland area that lies between Burnley in the north and Bacup and Rawtenstall in the south. It mainly comprises landscape character types C: Enclosed Uplands, and F: Settled Valleys as well as some urban areas. Three spurs of undulating high ground extend northwards from the Irwell valley to around 300m AOD, separated by valleys draining southwards. The landscape is characteristically enclosed by stone walls, even at high altitude, except on the northern fringes of the area, which are open moorland rising to around 400m AOD. Farmland landscape quality is frequently poor or mixed. There is no existing wind farm development although the Hameldon Hill site (3 turbines 90m high) lies just outside the northern boundary of the area.

Intervisibility

The relatively steep, enclosed southern edges of these moors are very visible from the settled landscapes of the Irwell valley to the south, from which they form the immediate skyline, containing views to the north. The gentler western, northern and eastern upland edges are somewhat more open in character and afford longer views into the Forest of Rossendale. There are also many views across the area from the north-south road routes over the upland (A682, B6238, A671) and from surrounding uplands, including Oswaldtwistle Moor to the west, Heald Moor and Todmorden Moor to the east, and Scout Moor to the south. These adjacent uplands offer clear views into the area for recreational users from the Rossendale Way and Burnley Way, as well as from the Pennine Bridleway which runs north-south across the area.

Capacity Assessment

Constraints

The most sensitive parts of this landscape are the visually exposed slopes on the southern edges of the area above the Irwell valley, and the distinctive tops and escarpments at the area's northern edge around Great Hameldon, Hameldon Hill and Nutshaw Hill, which also form key skyline features when seen from the Forest of Bowland AONB to the north. These areas have little or no capacity to accommodate wind energy development. There are areas of deep peat on the upland summits, notably in the north; and also some sites of historical and cultural interest, relicts of the area's mining history. The route of the Pennine Bridleway is sensitive to any nearby wind energy development.

Opportunities

There may be an opportunity for wind farm development in the open, domed central part of these enclosed upland blocks (type C), for example around Swinshaw Moor or Small Shaw Heights. Here settlement is relatively sparse; skylines are less prominent and distinctive than elsewhere, landscape quality relatively poor, and deep peat is less widespread than it is further north. The scale and extent of the areas concerned suggest possible capacity to accommodate development up to the size of a medium wind farm, subject to careful consideration of issues of cumulative impact (see below).

Guidance

Siting towards the centre of the upland block will help reduce impacts on views from the Forest of Bowland AONB as well as visual impacts on nearby settlements. Clear visual relationships with operational and consented turbines at Scout Moor and Reaps Moss will also be important. Existing roads and access tracks should be utilised for access wherever possible. Care should be taken to avoid or minimise damage to stone wall enclosures, and appropriate restoration should be undertaken. Consideration should be given to undergrounding of existing transmission lines at the northern end of this area to help enhance the landscape and visual environment overall. Given the presence of scale comparators and the relatively small extent of possible capacity areas, turbines of medium rather than large height may be more appropriate.

Cumulative and cross-district issues

Any wind energy development in this area will tend to intensify wind energy influence on the landscape of this part of the South Pennines because it will form a visual link between Hameldon Hill to the north, Scout Moor to the south, and Reaps Moss to the east. The aim should be to optimise visual separation from these sites, while recognising that there will inevitably be cumulative impacts on views from higher ground within the area, from which Scout Moor and Reaps Moss are already

visible (Hameldon Hill, being sited on lower ground to the north, is generally not visible). For this reason, any other wind energy development should be limited to single very small turbines at most.

Overall capacity
This area may have landscape capacity for the following:

- One medium wind farm, with turbines of medium or large height.

This landscape is currently part of a 'landscape with occasional wind farms' (reflecting the relatively close proximity of surrounding wind farms). Following the development described here it is likely to become part of a wider 'landscape with wind farms', particularly if additional development also takes place at Scout Moor to the south (see below). This means it will cross a threshold from a landscape strategy of accommodation to one of change.

Capacity Area 4: Scout Moor

Location and Context

Scout Moor is an outlying block of A: High Moorland Plateaux west of and separate from the main South Pennine ridge. The area is ringed by the Irwell, Roch and Spodden valleys and by built up areas, including Bury, Rawtenstall and Rochdale. The enclosed landscapes of D: Moorland Fringes/ Upland Pastures and F: Settled Valleys lie to the west, north and east, while to the south are areas of G: Wooded Rural Valleys. The moor rises to a height of 474m and at a broad scale has a gently domed form, marked by a number of smaller knolls such as Knowl Hill. The north and east sides of the moor are somewhat steeper and more dramatic than the south and west which have a gentler, more rolling form. There is an existing wind farm on Scout Moor (26 turbines 100m high). The turbines are mainly located on the southern and western parts of the moor and accessed from the west.

Intervisibility

As a separate and discrete upland area, the Scout Moor capacity area is widely visible at close range from the valleys and facing hillsides all around. On its steeper northern and eastern edges, views from the valleys below are generally contained by the enclosing convex hillsides and the tops are not visible. On the gentler and more open southern and western edges the upland is more exposed to view, for example from the A680 which crosses its southern flanks. Over longer distances of 5km or more Scout Moor is widely visible from the M66, M62 and Greater Manchester to the south; from the tops of the West Pennine Moors to the west; from Pendle Hill (Forest of Bowland AONB) to the north; and from the moorland plateaux of the South Pennine Moors to the east, where recreational viewers are affected. Visibility from lower ground to the west, north and east is relatively limited.

Capacity Assessment

Constraints

Much of the moor is underlain by deep peat deposits. The cloughs to the south contain ancient woodlands while part of the northern slopes is a geological SSSI. The surrounding valleys contain a number of historic parks and gardens and Conservation Areas (the latter often representative of the area's important industrial heritage); these may be sensitive to impacts on their landscape settings. Important recreation and amenity interests include extensive access land and the Pennine Bridleway National Trail and Rossendale Way long distance path, both of which cross the moor.

Opportunities

Notwithstanding these sensitivities and constraints, the gently domed, expansive form of Scout Moor (high moorland plateaux, type A) may have capacity to accommodate further development up to the size of an additional large wind farm if integrated visually with the existing wind farm. The area's open moorland, distinctive skylines and relative wildness have already been significantly affected by the existing wind farm. In addition, the northern and western part of the moorland plateau and fringe are not of the highest landscape quality, being affected by a series of disused hard rock quarries on higher ground. There may be scope in this area for further wind energy development without major additional impacts.

Guidance

Any additional wind turbines should be of consistent height and design to existing turbines. Turbine siting should avoid the prominent knolls that occur on the moorland summit; and turbines should be set back from steep moorland edges such as those above Bacup by at least 400m to avoid undue intrusion on the settlements of Bacup and Whitworth below. A compact layout should be sought to minimise impacts on landscape character and on longer views as described above; and site access, layout and transmission arrangements should be integrated with existing. The layout should also aim to minimise impacts on deep peat deposits (eg through siting on quarried land); and impacts on other natural and cultural heritage and recreation interests as described above. Measures should be put in place to minimise the impacts of recreational motor vehicles, which can cause erosion and loss of tranquillity.

Cumulative and cross-district issues

The close proximity of Scout Moor to the consented Reaps Moss and Crook Hill wind farm sites suggests that great care should be taken to ensure that adequate visual separation is maintained. In

particular, separation of at least 3-4km should be maintained in the Britannia area, between Scout Moor and Reaps Moss to prevent views from the valleys to the east and north becoming dominated by turbines. Given the large scale of wind energy development on the Scout Moor summit, any further development other than single very small turbines should generally be avoided elsewhere in this compartment, as it could be visually distracting and give rise to significant cumulative impacts.

Overall capacity
This area may have landscape capacity for the following (including the existing Scout Moor development):

- two large wind farms or one very large wind farm with large turbines.

This area is currently part of a wider 'landscape with wind farms' and following this development is likely to remain a 'landscape with wind farms', representing a landscape strategy of change. However any further development to the east, around Reaps Moss or Crook Hill character (see assessment sheet for CA5: South Pennine Moors), could tip the balance in this area to a 'wind farm landscape' ie creation of a fundamentally new landscape.

Capacity Area 5: South Pennine Moors

Location and Context

This area comprises the main South Pennines upland spine, extending from Widdop Moor in the north to near Denshaw in the south, and the scarp slopes to the west. In two places the upland is broken by deep glaciated valleys, namely at Cornholme (Cliviger Gorge) and Littleborough (River Roch and Rochdale Canal) but nonetheless it forms a distinct and coherent landform: the so-called 'watershed landscape'. The moors consist mainly of landscape character types A: High Moorland Plateaux and D: Moorland Fringes/ Upland Pastures, with narrow bands of F: Settled Valleys and G: Wooded Rural Valleys, notably in the central section of the area. The land rises to between 300 and 500m AOD. In many areas, particularly within the two main upland blocks to north and south, the landform is broad and sweeping, but in other areas, particularly along the ridge from Crook Hill to Heald Moor, it is more complex and varied. This central section of the moors is also characterised by especially steep and dramatic scarp and gorge features around the upland edge. There are operational wind energy sites at Coal Clough (24 turbines 49m high) and Ovenden Moor (23 turbines 49m high) and further consented sites at Reaps Moss (3 turbines 120m high) and Crook Hill (12 turbines 120m high).

Intervisibility

The moorland tops are characterised by their very wide intervisibility when viewed from high ground and from the infrequent roads that cross the upland area (M62, A672 and A640). There are views northwards to the Forest of Bowland and the Yorkshire Dales and southwards to the Dark Peak in conditions of good visibility. These open, long distance panoramic views also characterise the Pennine Way National Trail which runs north-south across the open moorland tops, often in a seemingly empty, remote landscape. By contrast the Pennine Bridleway National Trail and the many other long distance paths giving access to these uplands for nearby urban populations (Burnley Way, Todmorden Centenary Way, Rossendale Way, Rochdale Way) generally tend to follow upland edges, affording more varied views across both valleys and adjoining moors. Within the settled and wooded rural valleys, however, views of the moors are very limited indeed, the visual focus being on the steep, dramatic valley sides. Towards the southern end of this capacity area, visual character changes markedly in the area north of Marsden, where views south to the Dark Peak open up for the first time.

Capacity Assessment

Constraints

Although in character terms at least parts of this area appear suited to wind energy development, there are many significant landscape and other environmental constraints. Much of the area is of very high scenic quality, having been identified by Hobhouse as a potential AONB and today lying at the heart of the South Pennines Heritage Area. The area is important to the continuity of the Pennine backbone, and is especially sensitive in this regard where the moors are narrow (notably between Crook Hill and Heald Moor). The recreational experience offered to nearby urban populations is outstanding and includes rare opportunities to enjoy relative wildness and tranquillity, as well as two National Trails and a wide range of other walks and outdoor recreational pursuits. In addition, a high proportion of the area is covered not only by deep peat but also by national and international nature conservation designations (SSSI, SAC and SPA); and there are highly valued historic and cultural heritage interests and associations. The moorland fringe landscapes, although relatively lacking in nature conservation designations, are just as sensitive as the open moorland plateaux but for different reasons. They often form distinctive, sharp skylines above the valleys, for example at Cliviger Gorge, and with their many long distance paths they tend to offer the best panoramic views and provide a special chance to enjoy the scenic contrasts between the moors, fringes and valleys. These fringe landscapes also include valued regional and sub-regional recreation destinations and gateways to the uplands, including Watergrove Reservoir and Hollingworth Lake Country Park.

Opportunities

Opportunities for further wind energy development within this area should largely focus on existing development sites (all of which lie within the high moorland plateaux, type A), so as to ensure that wind energy development impacts do not spread over a wider area than at present or further affect the integrity of the core areas of wild character and nature conservation interest north and south of The Calder valley. The main areas of opportunity are therefore associated with existing sites at Coal Clough and Ovenden Moor, where repowering and some site expansion may be accommodated

subject to detailed consideration of landscape and other environmental impacts. Opportunities for expansion of wind energy development on the Crook Hill to Heald Moor ridge are however much more limited due to space constraints on this relatively narrow ridge, as well as potential cumulative impacts (see below). In this area the preferred long term landscape strategy is one of decommissioning and restoration of an open moorland character.

Locally on the north-western edges of this area, the moorland fringes (type D) may also have some limited capacity for wind energy development. Landscape sensitivity here is lower in this area than in other parts of the moorland fringe (see sensitivity assessment sheet) as the landscape has already been affected by influences such as quarrying, transmission lines and urban fringe land uses. The relatively gentle, rounded slopes east of Burnley may offer the best opportunity for a small group of turbines or a small wind farm on a mid-slope location similar to that of Hameldon Hill wind farm; areas south of this have less capacity as they are too close to other existing or consented wind energy development.

Guidance
Any new or extended wind energy development should not detract from, and where possible should support, strategic landscape management and enhancement (especially the Pennine Prospects Watershed Landscapes Project). In particular, any further erosion of accessible 'wild' areas should be avoided through very careful siting, layout and design measures.

Existing access tracks should be utilised where possible (provided these are not historic features in their own right, eg Long Causeway) and the impacts of any new access track construction should be minimised through careful engineering design and assessment of visual impact. Tracks should avoid areas of blanket bog and steep slopes; and measures should be put in place to minimise the impacts of recreational motor vehicles, which can cause erosion and loss of tranquillity. Opportunities should be taken to improve the management and condition of moorland habitats, but any fencing on common land should be minimal and temporary, to maintain open character and recreational access. Grid connections should be underground wherever possible.

Turbines of consistent size and design should be used at each location and care should be taken to avoid siting turbines close to the crest of steep slopes eg above Cliviger Gorge. Any development in the moorland fringe landscape east of Burnley should utilise turbines of small or medium height at most, sited so as to be backclothed against the hillside; and should minimise impacts on settlements and Conservation Areas nearby. Adequate separation from Coal Clough wind farm will also be important in this area.

Cumulative and cross-district issues
There are limited cumulative impacts over much of this area at present. The exception to this is the western edge of the area, where sites at Coal Clough, Reaps Moss and Crook Hill are located only around 5km apart along a north-south line and also lie close to Scout Moor and the Forest of Rossendale, where there may be opportunities for new wind farm development in future. Here four or five wind farms may be visible from any one viewpoint. This is one of the reasons why, as indicated above, the Crook Hill to Heald Moor ridge is at or very close to its capacity for wind energy development. Any development on the northern part of this ridge would be especially difficult to accommodate in landscape terms due to potential impacts on the Cliviger Gorge and cumulative impacts with Coal Clough.

Overall capacity
This area may have landscape capacity for the following (including existing operational and consented development):

- three large wind farms with large turbines (Coal Clough, Ovenden Moor, Crook Hill);
- one small group of large turbines (Reaps Moss);
- one small group of small or medium turbines.

Much of this area is currently a 'landscape with no wind farms or infrequent wind farms', representing a strategy of conservation, and this is appropriate given the strategic importance and value of this core area of the South Pennines.

However the western part of the area is a 'landscape with occasional wind farms' that is in the process of becoming a 'landscape with wind farms', representing a landscape strategy of change. Further development here could easily tip the balance to a 'wind farm landscape' ie creation of a fundamentally new landscape character, and should therefore be avoided.

Capacity Area 6: Calder Valley Moorland Fringe

Location and Context

This area lies to the south and east of the South Pennine Moors and represents the immediate, enclosed moorland fringes and valleys on the dip slope of the Southern Pennines. Typically these landscapes lie at elevations of between 250 and 300m AOD and form complex sloping terraces of farmland, just below the steep, pronounced gritstone edges that fringe the moorlands on the east. Below these terraces there is frequently a further very steep drop into the valley bottoms below. The landscape character types within this area include some prominent fingers of A: High Moorland Plateaux (notably Midgley Moor north of Mytholmroyd), but the bulk of the area is D: Moorland Fringes/ Upland Pastures and E: Rural Fringes, enclosing areas of F: Settled Valleys and G: Wooded Rural Valleys in the valley bottoms below. There is no significant operational or consented wind energy development in this area at present.

Intervisibility

Visually this area is perceived separately from the open, level, undulating tops of the South Pennine Moors. It looks westwards towards the valleys of the Yorkshire River Calder and its principal tributary, the River Ryburn. Because of the terracing and generally broad valley form, most of the area can be seen from below and forms an outstanding landscape setting to the scenic towns of Mytholmroyd, Hebden Bridge, Todmorden and Ripponden on the A646 and A58, with their early industrial heritage. West of Hebden Bridge, visibility is generally contained within the valleys but further east, towards Sowerby Bridge, views to and from Halifax (just outside the area) open up.

Capacity Assessment

Constraints

This is a complex, small scale and highly scenic landscape which, like the South Pennine Moors, lies at the heart of the South Pennines Heritage Area in terms of scenic, natural and cultural heritage interest. Fine vernacular buildings and settlements, including a strong concentration of Conservation Areas and early industrial heritage, characterise the valleys. The dramatic, valley slopes, for example those around Midgley Moor and Stoodley Pike, are highly sensitive, affording some of the finest panoramic views within the whole of the Pennine uplands, which can be enjoyed from the Pennine Way, Pennine Bridleway and other routes such as the Calderdale Way. There are extensive areas of small, early, patterned enclosures; narrow winding lanes; areas of deep peat; and ancient woodlands in deeply incised valleys below. Hence most of the landscape is both highly sensitive to any physical change and affords very little space for wind energy development.

Opportunities

There are very few opportunities for any significant wind energy development. Only two small areas may have some capacity for a small group of turbines or small wind farm, subject to consideration of any specific impacts on landscape interests including those outlined above. These lie at the northern end of the area, around Blackshaw, where the moorland fringe landscape (type D) is relatively simple, large scale, and steps back from the valley edge; and in the rural fringe landscape (type E) of the southern part of the area, where proximity to the M62 motorway and quarrying influences reduce landscape sensitivity somewhat. Otherwise this area is likely to be able to accommodate single very small turbines at most.

Guidance

Any wind energy development, of whatever scale, should avoid locations close to the lower edge of the moorland fringe terrace, as such locations are very prominent in views from the settled valleys below. Where development is sited within moorland or rural fringe landscapes, turbines of small or medium height at most are likely to be appropriate; these should be backclothed against hillsides above. Close juxtaposition with small scale landscape features such as gritstone tors and farm buildings should be avoided. The impacts of access tracks on enclosure patterns should be minimised; any damage should be carefully restored; and grid connections should be underground.

Cumulative and cross-district issues

Some of the higher ground within this area already has views of surrounding wind farms at Coal Clough, Ovenden Moor, Royd Moor and Scout Moor; there will also be views of Reaps Moss and

Crook Hill when built. If the development opportunities described above materialise, it will be important to maintain adequate visual separation from the existing wind farm at Coal Clough; and to consider cumulative impacts of any new development with the consented Scapegoat Hill site in CA8 just south of M62 near Huddersfield (2 turbines, 25m).

Overall capacity

This area may have landscape capacity for the following:

- One or two small groups of turbines or a small wind farm, with turbines of small or medium height at most.

This landscape is currently a 'landscape with no wind farms or infrequent wind farms'. Following this development it is likely to remain a 'landscape with no wind farms or infrequent wind farms', representing a continuing landscape strategy of conservation, which is appropriate given the strategic importance and value of this core area of the South Pennines.

Capacity Area 7: Halifax and Brighouse

Location and Context

This is a densely settled landscape centred on the urban settlements of Halifax, Brighouse and Elland and their hinterlands north and south of the Calder valley, including a number of tributary valleys north of the main river. The area is bounded to the west by the steep slopes at the foot of the moorland fringe and to the south and east by the M62 motorway, which has become an important physical and perceptual divide. The principal landscape character types in the north are K: Coalfield Edge Urban Fringe Farmland, separated by bands of G: Wooded Rural Valleys trending north-south; while in the south the landscape comprises types M: Industrial Lowland Valleys, F: Settled Valleys and E: Rural Fringes. The highest ground occurs in the north at around 400m AOD, falling to around 100m AOD in the main valley bottom before rising again to 200-300m AOD along the M62 motorway corridor. There is no significant operational or consented wind energy development in this area at present.

Intervisibility

This area forms a broad, inward-facing bowl around the river and the urban areas. The eastern parts of the area can be seen from the M62 motorway, particularly where it crosses the Calder valley at Brighouse. Good views into the area are also obtained from most of the radial routes into Halifax, including the A646 from the east, the A644 from the north, the A649 from the east, and the A629 from the south, which makes a dramatic descent from the M62. The slopes to the north are visually very exposed, and are mainly developed. The edges of the moorland tops above are also visible, but the moorland plateaux are generally hidden from view, from the urban areas at least.

Capacity Assessment

Constraints

Much of this area is of moderate-low sensitivity to wind energy development due to the high degree of human influence and the mixed landscape quality, although the sensitivity of the settled valleys and wooded rural valleys is higher. The key constraint is lack of space for any significant wind energy development, given the densely settled urban and suburban character of most of the area. The relatively few pockets of undeveloped land often represent fragments of higher quality, intact landscape that are highly valued as a recreational resource by nearby urban populations and are accessed via a dense network of public rights of way (including sections of the Calderdale, Brontë and Kirklees Ways). Sites on the crest of narrow ridges that directly overlook settled or wooded rural valleys (eg on the eastern outskirts of Halifax) would be unsuited to development due to their extreme visual prominence.

Opportunities

Some modest opportunities for wind energy development up to the size of a small group of turbines (or exceptionally a small wind farm) may occur on higher ground on the north-eastern edges of this area within the coalfield edge urban fringe farmland (type K) – especially towards the M62 motorway corridor to the east. There may also be opportunities further south, around Southwram (between Halifax and Brighouse), an area that is heavily influenced by quarrying and industrial activity; and in the industrial lowland valley landscapes (type M) within the river corridor (although the wind resource here is limited). In these areas single turbines or small groups of turbines would be more appropriate.

Guidance

A key issue will be appropriate separation from settlements and features such as walking routes. Special attention should be given to impacts on views from surrounding towns and villages, and to the visual relationship with the M62 and the many transmission lines that cross this landscape. When accessing wind energy developments, any damage to field enclosure patterns (stone walls) should be minimised and appropriate restoration undertaken. Given the relatively expansive underlying landform and large enclosures, the landscape within the coalfield edge urban fringe farmland may be capable of accommodating medium or even large turbines. In other areas however, the presence of scale comparators such as woodland and existing industrial structures means that small turbines are likely to be more appropriate.

Cumulative and cross-district issues

Most of this landscape has few or only very distant views to existing wind energy development, except for Ovenden Moor, which is visible from western parts of the area only. In siting any new wind energy development, adequate visual separation from Ovenden Moor is desirable and any cumulative impacts should be given careful consideration. Cumulative impacts with any wind energy development that may take place in CA9 Batley and Dewsbury may need to be considered in future.

Overall capacity

This area may have landscape capacity for the following:

- Several small groups of turbines, or exceptionally a small wind farm with medium or large turbines on the higher ground in the north-eastern part of this capacity area;
- Several single or small groups of very small or small turbines in the south around Southwram and the Calder river corridor.

This landscape is currently a 'landscape with no wind farms or infrequent wind farms'. Following this development it is likely to become a 'landscape with occasional wind farms' or even a 'landscape with wind farms', representing a landscape strategy of accommodation or change.

Capacity Area 8: Huddersfield and Dark Peak Fringes

Location and Context

This is a relatively wide area within which a consistent range of landscape character types occurs; the same landscape and visual relationships are repeated across the area revealing patterns of constraint and opportunity for wind energy development. The southern and western edges of the area, which abut the Dark Peak, comprise relatively flat, regular, enclosed, walled landscapes (D: Moorland Fringes/ Upland Pastures and E: Rural Fringes) which extend towards Huddersfield as the fingers of higher ground separated by the deeply incised valleys of the River Holme, Fenay Beck and their tributaries (types F: Settled Valleys and G: Wooded Rural Valleys). Further north are extensive urban areas and the industrial Colne valley at Hudderfield (type M: Industrial Lowland Valleys). Elevations range from around 350m AOD on the southern and western edges of the area to around 60m AOD near the confluence of the Colne and the Calder. There is no significant operational or consented wind energy development in this area at present, apart from three small turbines.

Intervisibility

The southern and western edges of this type are defined by the abrupt gritstone edges of the Dark Peak, which form the visual boundary for the capacity area and largely contain views to the moorland tops beyond. To the east the landscape is enclosed by the rounded hill slopes of Emley Moor; and to the north by the M62 corridor, which runs along the top of a long ridge line at Scapegoat Hill. From higher ground all around the edges of the area there are long views across the area as whole, many views focusing on the town of Huddersfield itself, on which most road routes converge. A key landmark on the southern outskirts is Castle Hill Fort, which is visible from most parts of the area. From the town itself there are outward views to the Dark Peak and to Emley Moor, which form backdrops to the valley settlements. The valleys themselves are more contained visually, generally being enclosed by steep valley sides, but views open up around their edges, where settlement frequently climbs the hillsides.

Capacity Assessment

Constraints

The key constraints to wind energy development are the extensive areas of patterned, enclosed landscape, with settled valleys and wooded rural valleys in deeply incised valleys below, generally allowing little room for significant wind energy development. The fingers of higher ground that separate the valleys have steep, dramatic sides; development close to these edges would be extremely prominent viewed from below, where settlements such as Holmfirth contain many fine vernacular buildings, Conservation Areas and important early industrial heritage. The eastern part of the area, around Fenay Beck, has a particular concentration of designed parkland and woodland, frequently ancient in origin. The uphill edges of the moorland fringe are often of outstanding scenic quality, being dominated by steep cliffs above and providing the immediate setting for the Peak Park. Walking routes such as the Kirklees Way follow these edges, taking advantage of the fine views.

Opportunities

Despite these constraints there are localised areas that may offer modest opportunities for wind energy development. These occur principally in the moorland fringe landscape (type D) in three broad locations.

The first location is near Park Head and Low Common in the south-east, where the land is elevated, flat and expansive, with large, simple enclosures. Well-sited turbines here might be seen in close association (or even as a cluster) with operational and consented wind energy development just outside the study area at Royd Moor, and a medium or even large wind farm might be accommodated, given careful siting, layout and design. The second broad location is south and south-west of Huddersfield in locations where field enclosures are large and simple and land relatively flat, and where locally landscape quality is affected by human influences such as forestry, reservoirs, an airfield and golf course. The third possible location is the ridgeline close to the M62 around Scapegoat Hill west of Huddersfield, where high ground is already affected by influences such as masts and quarrying. In these latter two locations there is likely to be space for small groups of turbines or a small wind farm at most.

In landscape terms, single turbines or small groups could also be accommodated in the industrial lowland valley (type M) of the Colne at Huddersfield, but the wind resource here is limited.

Guidance

Key issues in this area will vary depending on location. In the area around Park Head, setback from the distinctive steep slopes to the north and west and consideration of layout and cumulative impacts with existing wind farm development nearby will be essential. Turbine design and height should be consistent with other sites within this cluster (likely to be large). South-west of Huddersfield key considerations will be to ensure that development does not adversely affect the settings of nearby settlements or break the Dark Peak skylines beyond, suggesting that turbines should be of small or medium height at most. West of Huddersfield medium or even large turbines could form a new landscape feature (ideally coupled with other environmental enhancement measures), subject to road safety considerations and careful visual design that respects the ridge's distinctive topographic form. In the Colne valley any turbines need to be carefully designed in relation to existing industrial structures and in scale with the distinctive wooded bluffs that line the valley in this area. This points to turbines of up to medium height.

Cumulative and cross-district issues

Cumulative issues are limited at present, as there are only two small wind energy sites within this area (Dunford Road Holmfirth, one turbine 40m high; and Scapegoat Hill, 2 consented turbines 25m high). The nearest sites outside the area are those around Royd Moor to the south-east (not widely visible within the area). There are also some distant views from high ground of Ovenden Moor and Crook Hill (both around 20km away). Any new development near Royd Moor should minimise cumulative impacts through careful design and layout to create a coherent cluster with existing development; the same applies in the vicinity of Scapegoat Hill.

Overall capacity

This area may have landscape capacity for the following in the broad locations indicated above:

- A medium or even large wind farm with large turbines in the south-east;
- Two or three small groups of turbines or exceptionally a small wind farm (see guidance above for indicative heights) in the south-west and west;
- Several single or small groups of turbines up to medium height in the Colne valley.

This landscape is currently a 'landscape with no wind farms or infrequent wind farms'. Following this development it is likely to become a 'landscape with occasional wind farms', representing a landscape strategy of accommodation.

Capacity Area 9: Batley and Dewsbury

Location and Context

This block of land is bounded by the M62 motorway to the west and by the Calder valley to the south and south-east. The ridge along the south side of the Calder valley separates the area from Huddersfield to the south-west. The area includes a mosaic of types E: Rural Fringes, G: Wooded/ Rural Valleys, M: Industrial Lowland Valley, O: Industrial/Business Parks and U: Urban. The land falls from 150m AOD (in the west and north and on the south side of the Calder valley) to around 40m in the valley floor. Landform is intricate and rolling, and a series of wooded valleys and fingers of open farmland extends south-eastwards, penetrating the urban area. There are extensive areas of industrial land, particularly along the Calder, as well as major industrial, business and retail park development in the north associated with the M62.

Intervisibility

This area includes the visual envelope of the Calder valley including the open, visually exposed south-facing hillside on which the settlements of Batley, Dewsbury and Mirfield are sited. The area is not widely visible from the north or west, although its western, northern and eastern fringes are visible from the M62. It is more widely visible from the south, both from the ridge along the southern edge of the Calder valley and more distantly from higher ground around Emley Moor (eg from along the A642). There are only very limited views from the Huddersfield area to the south-west, due to the intervening ridgeline.

Capacity Assessment

Constraints

This is a very densely settled landscape with relatively little space for any large scale wind energy development. The attractive valley slopes to the south of the Calder are clothed in ancient woodland and form a key part of the landscape setting of Mirfield and Dewsbury as well as good countryside access. There is a country park on the northern edge of the area at Oakwell Hall, a battlefield site just to the north of this (partly outside the study area), and a historic park and garden at West Town, Dewsbury, as well as a number of Conservation Areas, mainly associated with the area's important textile mill heritage. The area is criss-crossed by a number of long distance paths including the Brontë Way, the Leeds Country Way, the Spen Valley Heritage Trail and the Kirklees Way and the fingers of open countryside also have a dense network of public footpaths.

Opportunities

Although often sensitive, particularly in terms of the visual and recreational amenity of the rural fringe landscapes, this area may offer some opportunities for relatively small scale development of single or small groups of turbines or a small wind farm. Such opportunities are most likely to occur in industrial/ business parks and industrial lowland valleys (types O and M), where there may be scope for visual and/or functional association with industrial, business or retail park development, particularly in the north of the area close to the M62 corridor and in the south-east, on the outskirts of Batley and Dewsbury. In the rural fringe (type E), single turbines serving individual businesses or farms may also be accommodated given careful consideration of any specific impacts on environmental interests including those outlined above.

Guidance

Wind turbines should be carefully sited and designed relative to existing structures, particularly where these are of historic importance as in the case of historic textile mills and chimneys. Special attention should be paid to relative heights and proportions and to impacts on town settings and approaches; this means that in this area turbines are likely to be of small (or at most medium) height.

In some cases, for example in industrial and business parks, there may be scope to use turbines (perhaps as part of a wider programme of environmental enhancement) to create a new focal point or landmark, drawing the eye upwards and away from existing intrusive features; taller turbines may be appropriate here subject to detailed assessment of landscape and visual impacts. Close to the motorway, particular attention will need to be paid to issues of highway safety and views from the road (in accordance with Highways Agency advice, see *Section 6*).

Cumulative and cross-district issues
Although there are some distant views to existing wind farm sites from higher ground within this area, there is no significant wind energy development within or close to the area at present, and there are therefore no issues of cumulative or cross-district impact. Cumulative impacts with any wind energy development that may take place in CA7 Halifax and Brighouse may need to be considered in future.

Overall capacity
This area may have landscape capacity for the following:

- Several single or small groups of turbines or a small wind farm with turbines up to medium height or (exceptionally) large height

This landscape is currently a 'landscape with no wind farms or infrequent wind farms'. Following this development it is likely to become a 'landscape with occasional wind farms', representing a landscape strategy of accommodation.

Capacity Area 10: Emley Moor

Location and Context

This area of open, elevated, gently rolling, mixed farmland occupies the south-eastern corner of the study area where it forms a distinct landscape unit within the eastern foothills of the South Pennines. It principally comprises land of type N: Rolling Wooded Farmland, but also includes part of the Dearne valley to the south which is type G: Wooded Rural Valleys, as well as small areas of E: Rural Fringes and urban land. The rolling landform of the area rises to around 270m at Emley Moor, with a second somewhat lower summit at Pool Hill near Denby Dale to the south. Slopes are steeper on the west and south and gentler on the east. Smaller, earlier enclosures occur on valley sides and around settlements while higher ground has larger, later and more regular enclosures of former moorland commons. The landscape contains significant woodland.

Intervisibility

Visually this landscape is dominated by the Emley Moor TV transmission tower (330m) which is a notable landmark from all directions and the focal point of almost all views to the area and many views within it. The principal route across the area is the A642 Wakefield Road. The area provides long outward views west to Huddersfield, north to the Calder valley and Dewsbury, east towards Barnsley (outside the study area) and south to the enclosing southern slopes of the Dearne valley. Seen from Huddersfield, Emley Moor forms an important eastern skyline.

Capacity Assessment

Constraints

In terms of scale, landform, built environment and various other factors, this landscape appears relatively well-suited to wind energy development – its overall landscape sensitivity has mainly been assessed as moderate-low. However the presence of the Emley Moor TV Tower (listed Grade II) is a key constraint due to the scope for visual conflict with this notable existing structure. Although the size of the tower is such that it would tend to diminish the apparent size any nearby wind farm, if turbines were to be sited in close proximity to the tower they would create visual clutter and thereby detract from its setting. This limits the scope for wind energy development on the moorland top, potentially the most suitable location in landscape terms due to its open, expansive, rounded form.

Other more localised constraints to wind energy development include the relatively steep slopes to the west and south, the area's settled character; the presence of ancient woodlands and parklands such as Grange Park and Whitley Park; and extensive historic iron workings around Emley Woodhouse.

Opportunities

There are limited opportunities for any significant wind energy development within this area, for the reasons outlined above. Exceptionally it may be possible to accommodate a small group of turbines or a small wind farm on open hillsides towards the northern edge of the area or east of Emley Moor TV tower, in locations where slopes are gentler, enclosures larger and settlement sparser.

Guidance

Any wind energy development should be well-separated visually from the TV tower. Impacts on the setting of the tower from key viewpoints should be very carefully assessed; potential visual conflicts with the church tower at Emley, an important local landmark, should also receive careful attention. Locations close to the relatively steep, prominent western and southern slopes of the area should be avoided; as should sites close to settlements and attractive, wooded, intimate valley landscapes such as those north and south of Flockton. Turbine height should be chosen to reduce visual conflict with the TV tower and this suggests that only very small or small turbines are likely to be suitable in design terms.

Cumulative and cross-district issues

This area is relatively little affected by wind energy development at present, although there are some views from high ground to the sites around Royd Moor, approximately 8km from the summit of Emley Moor. The cumulative impacts of any new development with this existing development should be given careful consideration.

Overall capacity
This area may have landscape capacity for the following wind energy development, provided the landscape considerations outlined above can be addressed satisfactorily:

- One or two small groups of turbines or one small wind farm with very small or small turbines.

This landscape is currently a 'landscape with no wind farms or infrequent wind farms'. Following this development it may become a 'landscape with occasional wind farms', representing a landscape strategy of accommodation.

Capacity Area 11: Northern Dark Peak

Location and Context

This area, which lies largely within the Peak District National Park, mainly comprises landscape character type A: High Moorland Plateaux, although it also includes, along its north-eastern fringes, small areas of D: Moorland Fringes/ Upland Pastures and F: Settled Valleys around Marsden in the north. The valley of the River Colne at Marsden, backed by the prominent gritstone edges of Firth Pule and Holme Moor to the south, marks the transition from the South Pennine Moors to the Dark Peak, the land rising within the Dark Peak to over 500m AOD. This area has a very dramatic character created by sharply defined, elevated and vast plateaux with 'gritstone ridges' and edges and long uninterrupted views. In parts the plateau edges are deeply indented, and contain reservoirs, surrounded by steep, forested slopes as at Holmbridge. There is no significant existing wind energy development.

Note: Much of this capacity area lies within the Peak District National Park. For wind energy developments inside the National Park, reference should be made to Land Use Consultants (2009) Landscape Sensitivity Assessment for Renewables in the Peak Sub-Region, report to the Peak District National Park Authority and others. This will form part of the evidence base for the Peak District National Park Local Development Core Strategy, which gives the policy response to wind energy development inside the Peak District National Park.

Intervisibility

The gritstone edge of the Dark Peak is a key landscape feature that is visually very exposed: it can be seen in views from the north and east for miles around. At the foot of the gritstone edge, by contrast, visibility is often tightly contained by the complex, deep, incised form of the valley heads. The high moorland plateau landscapes above are not widely visible, except from the plateau itself; they are mainly experienced from road routes such as the A62, A635 and A6024 which cross the moor, as well as from the route of the Pennine Way, which runs along the moor north-south. Once on the moor, panoramic views take in the moorland tops for miles around.

Capacity Assessment

Constraints

There are many significant landscape and other environmental constraints to wind energy development in the Dark Peak. Much of the area lies within the Peak District National Park and is therefore of acknowledged national importance for its natural beauty and recreational opportunities. The area is particularly valued for its wild character and sense of remoteness, which are rare in this part of England and vulnerable to change as a result of wind energy development. The Pennine Way National Trail provides a key opportunity to enjoy these landscape qualities. In addition to these factors, a high proportion of the area is covered not only by deep peat but also by national and international nature conservation designations (SSSI, SAC and SPA). The moorland fringe landscapes (including the reservoirs and forests) adjoining the National Park are very well used for recreation and are a key part of its setting. As elsewhere in the South Pennines, the best views are often obtained from the plateau edge, for instance from the Kirklees Way which follows the moorland edge over part of its length here.

Opportunities

Opportunities for wind energy development in this area are therefore very limited. The landscape has capacity for single turbines only, and these should generally be sited within the moorland fringe landscape (type D) rather than on the high moorland plateaux, where tall structures would be very exposed visually, particularly on the moorland edge, and would affect the landscape's wild character.

Guidance

Turbines should be located close to existing built elements or coniferous plantations. They should be backclothed against the slopes behind, so as not to break the skyline when viewed from the valleys and farmland below. Very small turbines are likely to be most appropriate. Care should be taken not to place turbines so that they will affect key views from escarpment above. Particular efforts should be paid to prevent potential impacts on the setting of the Peak District National Park.

Cumulative and cross-district issues
This area is relatively little affected by wind energy development at present, although there are some views from high ground to the sites around Royd Moor, which lies relatively close to the east, as well as distant views to a number of the sites further north in the South Pennines . Cumulative impacts with any further wind energy development that may take place in CA8 Huddersfield and Dark Peak Fringes may need to be considered in future.

Overall capacity
The Dark Peak area may have landscape capacity for the following:

- Several single turbines of very small height.

This landscape is currently a 'landscape with no wind farms or infrequent wind farms'. Following this development it is likely to remain a 'landscape with no wind farms or infrequent wind farms', representing a landscape strategy of conservation.

Capacity Area 12: Bury, Radcliffe and Rochdale

Location and Context

This capacity area comprises the urban and suburban areas of Bury, Radcliffe and Rochdale together with parts of Prestwich, Middleton and Chadderton on the northern outskirts of Manchester, as well as areas of open countryside within and around the urban areas. The principal landscape character types on the northern fringes of Bury and Rochdale are E: Rural Fringes and G: Wooded Rural Valleys, while type L: Lowland Farmland occupies most of the central and eastern parts of the area along the M62 corridor. Within the built up areas themselves there is a complex mosaic of types including U: Urban, M: Industrial Lowland Valleys and O: Industrial/ Business Parks. Key landscape features are the heavily industrialised river corridors of the Rivers Irwell and Roch; the M62, M60 and M66 motorways; extensive areas of quarrying and landfill; and many former textile mills as well as new industrial and business parks. The underlying landform is generally low and undulating. Topographic variations are frequently obscured by built development, but areas of higher ground along the M62 corridor generally reach 100-150m AOD; while north of Bury the land rises to around 250m AOD. Any existing wind energy development is very small scale.

Intervisibility

This broad lowland area is enclosed to the north by the southern slopes of Holcombe Moor, Scout Moor and Crook Hill, and to the south by the built up areas of Manchester. Seen from the motorway network, particularly from the M62 westbound as it descends the western scarp slope of the South Pennines, the area appears as an open, south-facing bowl. Internally there are complex patterns of intervisibility, many views being obscured by built features and by topographic variation. However, from much of the urban area, the lower slopes of the Pennine moors to the north can be seen as a backdrop.

Capacity Assessment

Constraints

The principal landscape constraints to wind energy development within this area, which is frequently of relatively low sensitivity to wind energy development, are the limited space available within and around the built up area and its close juxtaposition with residential land. In addition, there are many historic buildings, including landmark textile mills, whose settings may be sensitive to wind energy development. Locally there are some areas of recreational importance, for example in the Irwell valley near Prestwich and at Hopwood Hall near Middleton. The wind resource in this capacity area is relatively low except along the M62 corridor and further north on the fringes of the moors.

Opportunities

There may be an opportunity for wind energy development within the lowland farmland (type L) close to the M62 motorway corridor, where a medium or even large wind farm might be accommodated. The best location is likely to be an area with simple, relatively open landform, such as the area around Birch which is also characterised by existing large scale modern industrial development and landfill activity. Elsewhere within the area there may be opportunities to develop single or small groups of turbines associated with areas of industrial/ business park (type M) or industrial lowland valley (type O) landscape, for example south of Bury town centre. Finally there may be modest opportunities within the rural fringes (type E) north-west and north-east of Bury, again for single or small groups of turbines.

Guidance

A key issue in this area is the fact that any new wind energy development is likely to be seen in the context of views to existing turbines at Scout Moor and at Crook Hill when built. Although separation distances are reasonable, the potential for visual conflict should be considered carefully during the siting and design of any new wind energy development and should influence turbine layout and height. Where turbines are sited in an existing urban or industrial setting, scale and relationship to existing buildings will also be key considerations. The character and settings of any important historic buildings and structures should be respected. In most parts of this area, turbines should generally be of small or medium height at most, reflecting their proximity to existing buildings and structure. In the area near the motorway however, taller turbines might possibly be accommodated, subject to detailed landscape and visual impact assessment and careful consideration of road safety issues.

Cumulative and cross-district issues
Although there is little existing wind energy development in this area, potential issues of cumulative impact with Scout Moor and Crook Hill (theoretically visible from much of this area) need to be addressed as noted above. The visual relationship with Scout Moor and Crook Hill is especially relevant in the less built up southern part of this area, which has the clearest views to these sites. In future, the cumulative effects of new developments within the area will also need to be considered and adequate separation distances maintained.

Overall capacity
This area may have landscape capacity for the following in the broad locations indicated above:

- A medium or even large wind farm with medium or large turbines in the southern part of the area.
- Up to six single turbines or small groups, turbine height medium at most, in other parts of the area.

This landscape is currently a 'landscape with occasional wind farms', as a result of its close visual association with Scout Moor and Crook Hill. Following this development it is likely to become a 'landscape with wind farms', representing a landscape strategy of change.

6 Landscape and Visual Guidance on Wind Energy Proposals

6.1 Introduction

This section explains how to use the landscape sensitivity and capacity assessments in planning wind energy development. It provides generic good practice guidance on how to take landscape issues into account in initial scheme planning; siting, layout and design; and assessment of landscape, visual and cumulative impacts. Sources of further technical advice can be found in the bibliography in *Annex 3*.

The guidance is intended to be useful to all parties (developers, local planning authorities and consultees) involved in the preparation, presentation, review and consenting of wind energy development proposals in the South Pennines. Although focused primarily on larger scale commercial wind energy development, much of the guidance is also relevant for smaller scale domestic and community wind energy schemes. Any special considerations that apply to such schemes are noted.

6.2 Using the Sensitivity and Capacity Assessment Sheets

The sensitivity assessments for the landscape character types (LCTs) provide background information on a range of factors that are relevant to scheme planning:

- landscape scale, form and complexity, including the height of key landform and landcover features, which may influence the choice of turbine groupings and turbine heights;
- built environment and other man-made influences that may suggest some capacity for wind energy development;
- key skylines and settings that are important to landscape character and distinctiveness and may require protection;
- potential visibility and screening by landform or vegetation, which may assist in integrating wind turbines into the landscape;
- views that should be taken into account in siting and may also need to be covered in a landscape and visual impact assessment;
- areas of high landscape quality, scenic quality, wildness or tranquillity that may be sensitive to wind energy development, which could affect these special qualities;
- natural and cultural heritage features that contribute to landscape character and may need to be protected and/or receive special attention during the assessment of impacts;
- any known cultural associations (such as paintings or writings about this landscape), which may increase its sensitivity;
- key amenity and recreational features, such as long distance walking routes, which could be affected by the landscape and visual impacts of wind energy development.

The capacity assessments complement the sensitivity assessments, providing further details for geographically-specific capacity areas (CAs) of:

- the broad landscape and visual context for the area, including details of the principal landscape character types, views and viewsheds;
- location-specific landscape, visual and related constraints that may need to be considered in siting wind energy development;
- the key spatial opportunities for wind energy development, in landscape terms, taking account of both landscape character and landscape values;
- specific issues of siting, layout and design that may apply in these locations;
- issues and potential issues of cumulative and cross-district impact that may need to be addressed in this area, now or in future;
- the overall capacity for wind energy development of the landscape concerned, in terms of (indicative) numbers of sites, turbine groupings and turbine heights;
- the broad landscape strategy implications of undertaking the development described.

As noted previously, both the sensitivity assessment and the capacity assessment for a given location should be read together when considering any specific development site or proposal.

6.3 Initial Scheme Planning

The initial focus in planning a wind energy scheme is on site selection and identifying an appropriate type and scale of a wind energy development. Ideally this should include consideration and rigorous assessment of a number of different scheme alternatives. Good site selection and scheme definition are the most effective way of addressing issues of potential landscape and visual impact and ultimately ensuring that a proposal will gain planning permission.

Professional advice from a suitably qualified and experienced landscape architect is likely to be helpful from the outset. Initial scheme planning and siting, layout and design should be informed and influenced by an ongoing process of landscape and visual impact assessment (see *Section 6.5* below) to help ensure that proposals will be acceptable in landscape and visual terms.

For each possible development area or site, the relevant sensitivity and capacity assessment sheet(s) should be consulted as a first step, with a view to understanding the broad pattern of landscape sensitivities, opportunities and constraints within the affected landscapes. This should help identify the general locations where there may be some capacity for wind energy development, and the type(s) of wind turbine grouping and turbine height that might be accommodated. It should also indicate those areas where there may be significant landscape constraints to wind energy development.

This should be followed by more detailed specific site-analysis, as each potential development site is unique. Local variations in landscape character or value can be very significant and notable landscape and visual issues will need to be identified and addressed. More detailed work should include:

- analysis of landscape and visual characteristics and values for the area concerned, drawing also on more detailed landscape character assessment material and mapping (see *Annexes 1* and *2* and *Table 8*);
- identification of other sites within a radius of at least 30km and consideration of any relevant cumulative and cross-district issues;
- preliminary field survey of landscape and visual character and context;
- preliminary visibility mapping (see *Section 6.5*) and appraisal of potential impacts on key views.

By the end of this process, developers should have a clear understanding of which site(s) offer the best prospect in landscape terms of obtaining planning consent, the type(s) of development that are most likely to be able to be accommodated within the landscape, and any notable landscape and visual issues that will need to be addressed. The choice of site and development type should respect the specific sensitivity and capacity of the landscapes concerned and should accord with the landscape sensitivity and capacity principles set out in *Tables 6* and *7* in *Section 2*.

6.4 Siting, Layout and Design

Having selected a preferred development site, careful and thorough work on detailed siting, layout and design is required. This process ideally should be an iterative one and offers significant further opportunities to prevent or mitigate adverse landscape and visual impacts. Some key principles of good siting, layout and design are summarised in *Table 11* below. Where appropriate, these principles may also form the basis for planning conditions. Early discussion with the local planning authority on siting, layout and design issues and on relevant guidance to use during the design process is likely to be beneficial.

Table 11: Key Principles of Good Siting, Layout and Design

Siting

- Sites should relate well to the broad grain of the topography and should not distract from or obscure important character distinctions such as upland-lowland transitions.
- Siting should respect landscape settings and skylines, particularly the settings to distinctive landform features, settlements and historic landmarks such as hilltop monuments.
- Prominent and highly visible skylines, particularly those at the edge of upland areas, should generally be avoided.
- This is especially important in the South Pennines with its sharp and distinctive gritstone edges.
- Any wind energy development on the moorland plateau tops should generally be set back at least 400m from these gritstone edges to minimise impacts on views from the incised valleys below.
- When setting turbines back from the upland edge, try to avoid creating views of blade tips only, as these can be highly distracting.
- Significant impacts on key views from important viewpoints, popular tourist and scenic routes and settlements should be avoided wherever possible; at distances less than around 2km, wind turbines are likely to be prominent in the landscape and turbine movement will be clearly visible.
- Siting should identify and where possible avoid impacts on areas of wild character and on features of natural, cultural or recreational heritage interest that contribute to landscape character and landscape value.
- These may include important earth science features and habitats; deep peat; vulnerable bird species; areas of significant archaeological interest; historic monuments, designed landscapes, conservation areas and their settings; commons and other access land; and National Trails and other long distance paths.

Layout

- Alternative site layouts should be investigated from an early stage to find the optimum response to character as seen from key viewpoints. This is especially important where there are already wind farm sites in the same area.
- Careful layout and arrangement of turbines can help to ensure that turbines read as a coherent group in all the main views.
- Significant turbine overlaps, which may catch the eye, should be avoided.
- Layouts that reflect existing landscape patterns, such as regular field patterns or linear transport corridors, may allow the positive sculptural qualities of turbines to be seen to good effect.
- Screening afforded by existing woodland can sometimes be used to good effect through careful placement of turbines and adjustment of turbine base heights. However woodland or forestry screening should not be relied upon if felling is likely during the lifespan of the project.
- Adequate separation from walking, riding and other recreational routes is important to prevent adverse impacts on the landscape experience, amenity and safety of recreational landscape users. 500m is generally regarded as a sensible minimum.
- Where turbines are proposed to be sited near to trunk roads, safety issues and views from the road will also require consideration in accordance with Highways Agency advice.

Design

- The scale of development, in terms of lateral extent and height, should be in proportion with, and not overwhelm, key landscape elements such as valleys, ridges, hills and woodlands and historic monuments.
- A good design will respect the hierarchy of elements in the landscape and will not compete with, or create clutter when seen together with, other man-made landscape elements such as pylons.
- In urban or industrial contexts, developments should respond to the scale of the built form and sit comfortably alongside large buildings or structures, providing a balanced composition.
- Any existing focal points (such as historic textile mills) should be respected and visual conflict avoided; but in more modern industrial or commercial areas it may sometimes be appropriate to create a new visual focus.
- Consistent turbine height, layout and design are critical for sites that lie close to one another, particularly those within a cluster (ie within 3-5km to the outermost turbines).
- It may be useful to investigate a range of colour options for turbines, considering the background against which the turbines will usually be seen.
- Pale colours suit most sites in elevated locations where turbines will mainly be seen against the sky. Darker colours may be appropriate where turbines will be seen against a landscape background (more common for domestic and community turbines).
- All turbines on a site should rotate in the same direction and the maximum speed of blade rotations should be kept as low as possible to reduce visual impact.

Infrastructure

- Road access for long loads (eg blades up to 45m long) may necessitate road widening, creation of wide bell-mouth entrances and removal of features such as stone bridges, walls, gateposts, hedges and trees, affecting the fabric and character of the landscape.
- Such impacts should be minimised through good design and appropriate mitigation eg replacement planting. Measures that would urbanise the character of rural lanes eg kerbing and fencing should be avoided.
- Use of existing farm or forestry tracks (provided these are not historic features in their own right) may help reduce the impacts of on-site access tracks (typically 5-6m wide).
- However, access tracks should, wherever possible, avoid crossing or running along National Trails, long distance paths or other public rights of way.
- The length of new on-site access track should be minimised through efficient track layout, and tracks should be surfaced in a way that blends in with the surroundings. Where possible tracks should be re-vegetated (in full or in part) following construction.
- Opportunities should be taken to improve the management and condition of moorland habitats, but any fencing (especially on commons or other open access land) should be minimal and temporary, to maintain open character and recreational access.
- Access tracks on very steep slopes (where they may require zig-zag routes, cut and fill and drainage channels) or on blanket bog or wet marshy ground (where they may require extensive foundations) should be avoided wherever possible.

- Use of highly engineered solutions should be minimised as it may scar the landscape, and tracks should follow the contours (provided this does not entail excessive length).
- Measures should be put in place to minimise use of access tracks by recreational motor vehicles, which can cause erosion and loss of tranquillity.
- Where possible, transformers should be housed within the turbine tower to reduce their visual impacts, and on-site cables should be buried underground.
- Substation and control buildings should be carefully sited and should generally avoid high, exposed locations where they may be incongruous and provide a scale comparison with turbines.
- Use of local building materials and styles will help integrate such structures into the landscape. Hard surfacing, fencing and lighting around substations should be minimised.
- Grid connections should be underground wherever possible.

As an output of this stage of the work, it may be helpful for developers to prepare a design statement summarising the way in which scheme design has evolved and the reasons why particular siting, layout and design decisions have been taken. Such a statement can also explain the ways in which the key landscape and visual issues identified during initial scheme planning have been addressed.

It is recognised that siting, layout and design also need to take into account a range of specific ecological, ornithological, archaeological, built heritage and other interests, each of which will require specific assessment. Key issues include the presence of designated biodiversity and geodiversity sites, sensitive peatland habitats, important and vulnerable bird species and archaeological sites and monuments. All of these clearly may also influence siting, layout and design.

In the South Pennines a specific issue of importance relates to the impacts of wind energy development on blanket peatland. A large proportion of the national resource of this habitat type occurs within the South Pennines. Natural England has recently commissioned research that includes guidance on siting of wind farms on peatland habitats[18] and this will be of relevance to many wind energy developments within the study area.

6.5 Assessment of Landscape and Visual Impacts

For most wind energy developments, submission of an Environmental Impact Assessment (EIA) will be required under EIA Regulations. For smaller developments that do not require a full EIA, information will still be required describing environmental impacts and how they have been addressed. An assessment of landscape and visual impact will normally be a central part of the EIA for wind energy developments, and key good practice requirements for landscape and visual impact assessment (LVIA) are summarised below for reference[19].

[18] Natural England (2009) *Investigating the Impacts of Windfarm Development on Peatlands in England*, Part 1 Final Report and Part 2 Appendices and References.

[19] Refer to *Table 2* for definitions of LVIA terms. Further technical advice on LVIA can be found in Landscape Institute and Institute of Environmental Management and Assessment (2002) *Guidelines for Landscape and Visual Impact Assessment*, 2nd edition, Spon.

Table 12: Good Practice Requirements for Landscape and Visual Impact Assessment

Description of alternatives

- Describe the alternative sites considered and their landscape constraints and opportunities.
- Indicate why the final choice of site was made and why it was considered suitable in terms of potential landscape and visual impacts.
- Drawing on the design statement, describe the alternative conceptual design options considered, giving the reasons for choosing turbine numbers, height and the particular site, layout and design.
- Explain why the preferred solution represents the optimum landscape fit.
- Computer-generated wireline images may be helpful in illustrating this section of the EIA.

Project description

- Describe the project at each phase in its life cycle in sufficient detail to allow the assessment of landscape and visual effects.
- Include the location and dimensions or extent of all plant and structures, and describe the nature, scale and duration of project activities during construction, operation, and decommissioning.
- Construction phase information should include site access and haulage routes and construction details; turning circles and visibility splays; removal and protection of existing features; any cut and fill and drainage requirements; borrow pits and disposal areas; temporary lay down areas and crane hard standings; construction compound and materials storage; turbine foundations; temporary anemometer masts; site cable runs; and site reinstatement.
- Operational phase information should include details of number and type of turbines (including form, materials, colour etc); operational wind speeds and blade rotation speed; transformers; substation and control building; signage, lighting and fencing; landscape mitigation measures such as planting; grid connection; servicing and land management arrangements.
- Decommissioning phase information should include arrangements for removal of turbines and ancillary structures; proposals for restoration; and future land management.

Baseline assessment – landscape resources

- Agree with the local planning authority the size of the study area. For turbines of medium or large commercial height this should generally extend to a 30km radius around the site; for small turbines a 20km radius may be acceptable.
- Compile mapping and descriptions of the existing landscape within the study area, examining the broad landscape context (15-30km), landscape setting (5-15km), local landscape setting (2-5km) and immediate landscape setting (up to 2km).
- Cover landscape character, landscape values and landscape sensitivity throughout the study area, drawing on the relevant landscape character assessment reports, information on special landscape values (such as descriptions of landscape, natural and cultural heritage designations); and the landscape sensitivity and capacity assessment sheets.
- Describe how landscape character affects the sensitivity to wind energy development of the landscapes within the study area and define their level of sensitivity.
- In relation to valued landscape characteristics and features, explain the reasons why the characteristic or feature is important and its level of importance (ie national, regional, local).
- Describe the landscape of the site itself, including landform, landcover, features of natural and cultural heritage interest and access. Include details of the landscape fabric ie vegetation, trees, hedges and other boundary features and their condition.
- Confirm and expand this information through field survey.

Baseline assessment – visual resources

- Prepare mapping to show the area over which wind turbines may be seen (commonly referred to as the zone of theoretical visibility (ZTV).
- Review the ZTV and consider the site's contribution to visual amenity within the distance bands indicated above. Consider in the field the degree to which buildings, trees and vegetation may reduce or contain visibility.
- Use the ZTV and field work to help identify viewpoints to be covered in the assessment through the preparation of wireline images and photomontages. These viewpoints should be discussed and agreed with the local planning authority and other stakeholders at the scoping stage.

- The number of viewpoints required will vary but 15-25 viewpoints are likely to be necessary for most commercial wind farms, particularly in areas of high landscape sensitivity.
- Include views referred to in the sensitivity and capacity assessment, eg views from settlements; transport corridors; tourist and walking routes; specific receptors such as historic parks; and also locations where cumulative impacts will occur with other wind energy developments.
- Give priority to views from distances of less than 5km but also include some middle and longer range views.
- Include a range of receptors (viewer groups) and classify these in terms of their sensitivity. In general, those engaged in tourism and recreation eg walkers have higher amenity expectations and are more sensitive, while groups such as passing motorists and local workers have lower amenity expectations and are less sensitive.

Description of impacts

- This section should systematically identify and describe the likely effects of the proposal; indicate the mitigation measures developed; estimate the magnitude of the changes that will occur; and consider whether they will be beneficial or adverse. It should cover impacts at construction, operational and decommissioning phases.
- Impacts should be separately assessed under headings of landscape fabric, landscape character, landscape values and visual amenity and for each of the distance bands described above.
- For *landscape fabric*, the scale of impacts such as physical damage or loss and proposed mitigation should be given wherever possible, eg length of hedge lost, length of replacement hedging proposed.
- For *landscape character*, the assessment should briefly describe the changes that will occur to the character of each of the LCAs where wind turbines are visible (using the LCT and LCA frameworks provided in this report). It should consider how the wind farm will affect perceptions of character (eg landscape scale, patterns, focal points, skylines and settings etc) and how widespread and prominent the changes will be.
- For *landscape values*, the assessment should describe any changes in landscape quality, scenic quality, wildness, tranquillity, natural and cultural heritage features, cultural associations and amenity and recreation that will occur due to the development (given its distance and visibility).
- For *visual amenity*, the extent of visibility should be described by reference to ZTV mapping. Changes in views from the selected viewpoints should be assessed by reference to the wireline images and photomontages. Commentary and assessment should also be provided on impacts on residential properties within 2km; impacts on views from Historic Parks and Gardens and Conservation Areas within 5km; and impacts on views from the principal routes in the area (including the main road routes, tourist routes, National Trails and other long distance paths where appropriate).

Cumulative impacts

- Where there are any other operational, consented or application stage sites within a 30km radius of the site, cumulative impacts should also be assessed (recognising that there are varying degrees of certainty associated with these different types of site).
- Prepare cumulative ZTV(s) for a radius of at least 30km around the proposed development (the local planning authority may request that this be extended in some cases, for example where a highly sensitive landscape lies midway between two wind farm sites).
- Analyse the pattern of combined effects and identify key viewpoints within areas of overlap between the ZTVs of different developments, including some short and middle range views. Again, these viewpoints should be selected in consultation with the local planning authority and other stakeholders. Prepare cumulative wireline images for each of these viewpoints.
- Assess cumulative impacts under the same headings as site-specific impacts. Pay particular attention to issues such as:
    - the combined effect of different site accesses on the landscape fabric of a single hillside or valley;
    - how developments relate to one other and to the underlying landscape in terms of scale and capacity;
    - the extent to which the setting of valued landscapes or features may be eroded by cumulative impacts;
    - the combined visual effects of more than one wind farm on particular tourist routes or long distance walks when seen together or sequentially.

- In assessing the magnitude of cumulative impacts it may be helpful to consider the extent of overlap between the ZTVs of different developments, and the extent to which the proposed development extends the horizontal field of view occupied by wind turbines.

Assessment of impact significance

- Finally the *significance* of impacts should be assessed by reference to the *sensitivity* of the landscape or viewer and the *magnitude* of the change that is expected to occur. Significance should be classified, for example on five or seven levels from negligible to major. Good practice is to do this by means of a matrix that sets out the combinations of sensitivity and magnitude that give rise to specific significance levels.
- The assessment of significance should be informed by the relevant sensitivity and capacity assessment sheets, and should focus on the potentially significant impacts of the project, that is those that will affect decision-making.

In addition to text covering all the topics listed above, appropriate, high quality illustrations will greatly assist the assessment process and help people to understand the assessment findings. The preparation of appropriate maps, ZTVs, wireline images and photomontages is a complex and specialist process and expert input will be required. The project landscape architect should be able to advise on the selection of a suitable specialist and supervise the preparation of the illustrations. Submission of presentation material (including maps and other illustrations) as set out in *Table 13* below is recommended.

Table 13: Checklist of Presentation Material for Wind Energy LVIA

Conceptual design options
Computer-generated wireline images to show conceptual design options that were considered. Images accompanied by map(s) to show the turbine layouts that are illustrated and the viewpoint location, viewing direction, included field of view and appropriate viewing distance for the wirelines.

Site layout
Site layout plan showing position of turbines, access and internal tracks, compounds, substation and all ancillary elements in the context of the physical landscape fabric, including contours, type and condition of landcover, boundaries and trees, existing access points, utilities and important environmental features. Scale 1:25,000 or greater.

Turbines and other elements
Scaled elevations showing technical detail of turbines, transformers, substation and ancillary elements, with key dimensions. Typical photographs of turbines proposed.

Landscape character
Map showing site location and LCTs and LCAs within the study area on a colour 1:50,000 OS base (this may be reduced as long as it is legible). Map should indicate concentric distance bands from the outer turbines of the site including those distance bands used in writeup (ie 2, 5, 15 and 30km). Viewpoint locations should also be shown.

Landscape designations and values
Map showing site location and location of valued landscape features within the study area on a 1: 50,000 OS base (as before), including as a minimum all the 'landscape values' information detailed in *Table 8* of this guidance. Concentric distance bands as above. Viewpoint locations.

Zones of theoretical visibility
Maps of theoretical visibility to hub height and to blade tip height on a 1:50,000 OS base (as before), with transparent colouring to indicate the number of hubs or blade tips that may be visible at a given point. Maps should cover the whole study area with enlargements at 1:25,000 or 1:50,000 to show visibility up to 5km in more detail. Concentric distance bands as above. Viewpoint locations.

Visualisations
Computer-generated wireline images and (where possible) colour photomontages for the selected viewpoint locations. These should be based on photographs taken with a 50mm lens on a 35mm film format (or digital equivalent), reproduced at a size that, when seen at a normal reading distance of around 50cm, will appear similar to what would be seen in the field. The horizontal field of view should be similar to that of the human eye (around 50 degrees). Each visualisation should be accompanied by a photograph of the view as existing and by details of distance to nearest turbine, viewpoint grid reference and height AOD, viewing direction, included field of view and appropriate viewing distance.

Cumulative impacts
Location map (with individual turbine locations) for all operational, consented and application sites for commercial wind energy development within 30km. Presented on a 1:50,000 OS base (as before) with concentric distance bands. Overlain by transparent ZTVs of different sites in different colours, so that areas of cumulative visibility can be seen. Location of cumulative viewpoints. 180 or 360 degree computer-generated wireline images for these viewpoints, annotated with site name, status (operational, consented, application), and distance to nearest turbine.

6.6 Reviewing Applications

As explained at the beginning of this report, it is of key importance that wind energy development in the South Pennines should, as far as possible, be developed in harmony with the surrounding landscape and the needs of other users of the landscape resource, and in a way that is consistent across local authority boundaries and should recognise and respect the distinctive character, importance and values attached to the South Pennines landscape.

This capacity study will be used by the local planning authorities in determining planning applications for wind energy development. It will inform and underpin judgements on site suitability for wind energy development in landscape and visual terms and on the nature and significance of the impacts of specific proposed wind energy developments. In particular, it is expected that the information contained in the sensitivity and capacity assessment sheets will be used as part of the Local Development Framework evidence base to explain and justify decisions and recommendations that may be made in relation to landscape and visual issues within the planning balance when determining applications for new wind energy development.

Annex 1: Landscape Character Types

Approach and Sources

A consistent landscape character assessment was prepared for the study area using the SCOSPA landscape character assessment[20] as a starting point. This was considered suitable on the basis that it had been subject to public consultation and covered the largest proportion of the study area. The extended assessment covered urban areas as well as countryside and was undertaken in accordance with national guidance in landscape character assessment[21]. However, it should not be regarded as a full and detailed landscape character assessment, as it has been subject to only limited field verification and no public consultation apart from the consultation on the original SCOSPA assessment, which was undertaken ten years ago.

The study area included the districts of Burnley, Bury, Calderdale, Kirklees, Rochdale and Rossendale. The SCOSPA landscape character assessment covered much of Burnley and Rossendale but only parts of the remaining districts; and the majority of Calderdale had no existing landscape character assessment coverage. Coverage for other districts was variable in scale and content, but included:

- *A Landscape Strategy for Lancashire*, 2000, Lancashire County Council.[22]
- *Bury Landscape Character Assessment*, 2008, The Landscape Practice.
- *Rochdale Landscape Character Areas*, 2005, Extract from UDP (Policy NE/6 – Landscape Protection and Enhancement), Rochdale Metropolitan District Council.
- *Kirklees Landscape Character Assessment*, undated, extract pdf map and brief descriptions, Kirklees Metropolitan Council.
- *Peak District Landscape Character Assessment*, 2008, Peak District National Park Authority.

All these assessments were used and consulted in preparing the new landscape character assessment. In addition, landscape character assessments for the adjoining local authority areas of Oldham, Bradford and Barnsley were consulted as follows:

- *Oldham Landscape Character Assessment*, 2008, Oldham Borough Council.
- *Barnsley Borough Landscape Character Assessment*, 2002, ECUS and Land Use Consultants.
- *Bradford Landscape Character Assessment*, SPD, 2008, Bradford Council.

In order to achieve consistent coverage, the SCOSPA landscape typology, which identified landscape character types and landscape character areas, was extrapolated across all parts of the study area. This was achieved through reference to all the existing landscape character assessments detailed above.

[20] Land Use Consultants (1999) *South Pennines Landscape Character Assessment* (1999), report to Standing Conference of South Pennine Authorities (SCOSPA).
[21] Countryside Agency and Scottish Natural Heritage (2002) *Landscape Character Assessment Guidance for England and Scotland*, Countryside Agency and Scottish Natural Heritage.
[22] This assessment covers Burnley and Rossendale and uses a typology that is closely consistent with the SCOSPA typology.

The initial deskwork stage identified similar landscape character types in the other local landscape character assessments. These were cross referenced, and tied in to, the SCOSPA study classification. A draft landscape character types (LCT) map was prepared along with draft LCT descriptions, and this was then taken into the field and checked during a familiarisation site visit. Refinements were subsequently made to the mapping and descriptions.

Further deskwork then led to the development of landscape character areas (LCAs) following a similar approach to that adopted in SCOSPA whereby each discrete geographic area of a type is termed a landscape character area. After more detailed site work, these units were named, numbered and described. The exceptions to this were areas of industrial/ business park (type O) and urban (type U), which were not separately numbered or described; and areas where the landscape is heavily fragmented (eg around Batley), where (in some cases only) a single description was prepared to cover several separate small landscape character areas.

The remainder of this annex presents the LCT descriptions that emerged from this exercise[23]. These cover the whole study area and were used in this study. The accompanying LCA descriptions, which also form an important reference source on the landscape of specific areas, can be found in the following locations:

- In the case of Burnley and Rossendale, in the SCOSPA landscape character assessment (note that the more recent Lancashire landscape character assessment should also be consulted for these districts, although it is broadly similar);
- In the case of Bury, Rochdale, Calderdale and Kirklees, in *Annex 2* of this report.

Annex 2 also includes a labelled map showing all the LCTs and LCAs across the study area as a whole.

A: High Moorland Plateaux

The high moorland plateau rolls in a series of even, sweeping ridges across the central part of the area forming the heart and core of the South Pennines landscape. It is a windswept, exposed upland landscape raised above the dissecting valleys and is frequently enshrouded by mists and fog and possesses a strong sense of remoteness and 'wildness'. Distinctive physical features include the frost weathered tors and regoliths which crown some of the moorland summits and the characteristic stepped topography of interlocking terraces and edges corresponding to the interleaved layers of underlying Millstone Grit geology. The moorland is rich in history, culture and wildlife. The mosaic of upland habitats including heather moorland, blanket bog, acid grassland and wet and dry heathland are of great importance for key bird species as reflected in the designation of the South Pennines SPA. There is also good survival of prehistoric sites and the moorland landscapes represent a valuable resource for further archaeological research into the early stages of human exploitation. It is a landscape with strong cultural and literary associations forming a 'wild' backdrop to the novels

[23] Where material from the SCOSPA assessment has been reproduced, a few minor changes have been made to address obvious errors or inaccuracies.

of the Brontë sisters and an inspiration for the poetry of the former Poet Laureate Ted Hughes.

This is a `remote' landscape very sparsely settled with only occasional isolated farmhouses, many now abandoned and in ruins and contributing to the sense of remoteness. Resource exploitation is visible in the form of power supply structures including pylons, transmission lines, wind turbine developments and communications masts, as well as reservoirs and mineral extraction sites. In some areas, intervisibility between these developments diminishes the sense of isolation.

Key Environmental Features

- A perception of remoteness, isolation and wildness provided by the altitude, absence of trees and settlement plus expansive views.
- Mosaic of upland habitats, including blanket bog habitat, wet heathland, dry heathland and acid grassland which support an internationally important range of bird species (South Pennines SPA).
- Blanket bog is of international importance, supporting a specialist flora and associated fauna and representing a habitat of which the UK has 7-13% of the global resource.
- Important archaeological landscape with much prehistoric interest. The blanket bog is a significant archaeological and palaeoenvironmental resource.
- Strong cultural associations – powerful influence on and inspiration for the writing of the Brontë sisters and Ted Hughes, among others.
- Distinctive landform of terraces and gritstone edges reflecting the underlying geology and process of weathering. Frost weathered tors and regoliths are prominent features.
- High geological interest including several geological SSSIs, at natural and quarried locations.
- Reservoirs provide water and recreational resources, as well as supporting wildfowl and wader species.
- Absence of settlement, with only isolated dwellings and abandoned farmsteads.

B: Moorland Hills

This landscape type comprises the lower, gentler outlying blocks of moorland to the north and west of the main Pennine ridge. They have a softer and more rounded profile compared to the sharp edges and ledges of the high moorland plateau and are surrounded by comparatively wide valleys. Only the high moorland tops retain a sense of remoteness and isolation, elsewhere there are views out across the surrounding wide valleys and urban areas. The presence of several large woodland

blocks, both broadleaved and coniferous, also distinguishes these outlying areas from the high moorland core. The mosaic of upland habitats is of great nature conservation value, while the proximity to nearby urban centres means that these moors are very important for recreation.

Key Environmental Features

- Glaciated rounded hills, generally lower in altitude and less severe than the high moorland plateaux.
- Mosaic of upland habitats, including blanket bog habitat, heather moor, wet heath and acid grassland.
- Important archaeological landscape with considerable evidence of prehistoric settlement and land use. Rombalds Moor contains one of the largest collections of carved rock monuments in the country, recognised to be of International importance.
- Peat and blanket bog on the summits is an important natural and archaeological resource.
- A sense of remoteness and wildness created by the altitude, absence of settlement and long wide views.
- Accessible recreational resource for the surrounding urban areas with a number of recreational facilities and an extensive rights of way network.
- Close relationship with the adjacent urban areas providing the landscape backdrop for surrounding towns.

C: Enclosed Uplands

The upland plateau of the Rossendale Hills is distinguished by the geology with outcrops of Lower Coal Measures in combination with the Millstone Grit and a mantling of glacial boulder clay. It is generally a flat landform with only the peat capped ridges and summits providing pattern and diversity in the landscape. The distinctive character of these bleak uplands is derived from the history of colonisation and human attempts to conquer the moors. A network of gritstone walls encloses virtually the whole of the upland area, and the landscape is dotted with small isolated farms. Many of these are now abandoned and in ruins as farming has retreated downslope. The area's industrial history is reflected by the landscape of miner-farmer small holdings and squatter settlements, and a legacy of abandoned coal and lead mines and associated spoil heaps. The overall impression is of a somewhat derelict landscape with rush infested pastures-and tumbled stone walls. Views of prominent high tension power lines which cross the plateau top reinforce the sense of bleakness.

Key Environmental Features

- Undulating high plateau divided into three by intersecting valleys.

- Distinct cultural landscape and an unusual land use history (Forest of Rossendale) represented by the high altitude enclosure, the industrial and mining remnants, and the settlement pattern of small scattered dwellings and urban terraces.

- Different geology distinguished by presence of Coal Measures and lead veins. The legacy of abandoned lead and coal mines and spoil heaps, along with day holes and Bell pits from the Middle Ages represent important cultural artefacts.

- Enclosure landscape with eighteenth and nineteenth century gritstone walls climbing to a high altitude enclosing the upland. Many fields are now abandoned and walls are in a state of disrepair.

- Blanket bog crowns the high summits providing both landscape diversity, biodiversity and an important archaeological resource.

- Distinctive settlement pattern with isolated houses and small scattered dwellings at a high altitude.

D: Moorland Fringes/ Upland Pastures

The enclosed landscape of the moorland fringe and upland pastures are typically found between 250 and 300 metres altitude on the broad terrace flanking some of the main valleys a slopes fringing the open moors. These elevated areas have strong moorland connections both visually and economically, with the moors forming an integral part of the upland farming system. The land is divided into a patchwork of small fields enclosed by gritstone walls with areas of larger intake relating to later moorland enclosures. The land remains almost entirely grazing pasture and the remaining unimproved areas of in bye hay meadows and damp pastures are extremely valuable for nature conservation and support a rich and distinctive flora and important bird species including twite, curlew, lapwing and snipe. Other enclosures are intensively farmed and the bright green improved sward forms a sharp distinction with the more subdued tones of the moors. Much of the moorland fringe is in a state of transition; with some areas being farmed intensively and others, where farming is in decline, and a variety of other, non-agricultural land uses becoming common. Both can have a significant visual impact and this landscape type particularly sensitive and vulnerable to change. The area nevertheless retains an 'upland' character and sense of remoteness.

Settlement comprises isolated scattered farmhouses and their associated buildings with occasional clusters of buildings and short terraces of weavers' cottages. There is a general absence of trees except where the summits of the steep wooded cloughs penetrate these upland areas and occasionally tree clumps around farmsteads. The whole area has an open character often with long views out across the valleys and, on the edges of the area, across the extensive urban conurbations beyond.

Key Environmental Features

- Open, `upland' landscape character created by the altitude, absence of trees and long views, often with a sense of remoteness and isolation.

- A characteristic patchwork of upland pastures including small irregular fields and larger rectangular fields representing a later phase of moorland enclosure.

- A dense network of gritstone walls creates the field enclosures. The stone walls provide shelter and habitat for wildlife and are also of considerable historical/ cultural interest.

- Remnant unimproved upland pastures including colourful species-rich hay meadows and damp pastures are an integral part of the mosaic of upland habitats and are of great importance for nature conservation. Flushed meadows are of special interest.

- Numerous paved packhorse routes linking with an extensive public Rights of Way network, providing not only distinctive features but evidence of the historic strategic importance of the moorland fringes.

- Dispersed settlement pattern comprising scattered farmsteads (sometimes in fairly close proximity) and occasional short terraces of houses.

- A network of narrow winding lanes connects the farmsteads and settlements. Stone walls without grass verges often bound the lanes.

- Distinctive vernacular architecture dominated by the millstone grit building stone and including laithe houses and weavers' cottages.

- Frequent long views across the intersecting valleys and/or out over the urban conurbations that surround the South Pennines uplands.

E: Rural Fringes

The rural fringes form a lower lying domesticated landscape surrounding the uplands. Rarely more than 200 metres above sea level the conditions are less harsh with gentler slopes and a milder climate. These sheltered, more hospitable fringes are settled and intensively farmed creating a small scale, complex landscape, of more varied landform and vegetation cover than is typical of the higher areas. Trees thrive and are a distinguishing feature of this landscape type occurring around farmsteads, along stone wall boundaries and in small - medium sized woodland blocks. Farming appears more profitable and the majority of the fields are improved grassland grazed by a mix of both cattle and sheep and managed for a silage crop. Settlement includes scattered farmhouses, which often include a range of modern outbuildings, dispersed rural dwellings as well as numerous small groups of houses/villages frequently with newer suburban infill and edge developments. An intricate network of lanes and roads crosses the area and links to the adjacent towns and cities which surround the South Pennines. The proximity of the urban centres exerts an influence on landscape character with urban fringe land uses evident in many areas and pressures for development.

Key Environmental Features

- A sheltered, settled `domestic' landscape on the gentle lower slopes fringing the South Pennine uplands.

- Pattern of grassland pastures enclosed by gritstone walls as well as some hedgerow boundaries.

- Considerable tree and woodland cover with trees in shelterbelts and along field boundaries, numerous broadleaved woodlands - many of ancient origin, as well as small scale coniferous plantations.

- Isolated remnants of species-rich grasslands (hay meadow and wet pastures) exist within the improved grassland. Flushed meadows are of special nature conservation interest.

- Dense network of narrow winding lanes, with some roads, which link the area to the urban centres on the periphery of the South Pennines.

- Distinctive settlement character of scattered farms, individual rural houses and groups of dwellings clustered into small villages sheltering below the uplands.

- Vernacular building style and consistency in building material and design visually connects the rural fringes to the core of the South Pennine area.

F: Settled Valleys

The deeply incised narrow valleys that dissect the high moorland plateau are one of the most distinctive landscape types of the South Pennines. Parts of many of the main valleys are crowded by towns and urban areas, which originated at the point of a river crossing and expanded during the early industrial age. The textile mills, with their distinctive chimneys, dominate the urban skyline and are a hallmark of the South Pennines landscape. The tall gritstone terraces of weavers' cottages are a characteristic feature of the hillsides and canals, rail and roads often line the narrow valley floor. Settlements are generally concentrated on the south-facing slopes and along the narrow valley floor. North facing slopes usually remain free of development so that even within urban areas there are frequently views towards woodlands, the patchwork of in-bye pastures and the moorland edge. Broadleaved woodlands, many of ancient origin, cling to the steep slopes and fill the valley side cloughs, reinforcing the sense of enclosure within the valleys. The deep `hidden' side ravines with their fast flowing becks and dense woodland cover are also a distinctive feature.

Key Environmental Features

- Deep incised valley profile with steps and terraces and deep side cloughs reflecting the underlying geology and weathering processes.

- Sense of enclosure provided by the steep-sided profile and presence of woodland, emphasising contrast with the open moorland.

- Broadleaved woodland, much of ancient origin, on the valley sides and in the side cloughs supporting important fern, bryophyte and bird species.

- Characteristic linear pattern of urban settlement on the valley floor and the lower south-facing slopes, from which there are frequently views out to the woodland, pastures and the moorland edges.

- Distinctive vernacular architecture including mills, packhorse bridges and terraces of weavers' cottages providing evidence of the important role that these valleys played in our industrial history.

- Rivers and canals creating green corridors and a valuable recreational resource as well as important wetland habitats, supporting a number of notable rarities.

- Valley wetland habitats including fens and wet pastures.

- Wealth of historical and archaeological interest, reflecting the historic evolution of the area.

- In-bye pastures and hay meadows on the valley sides form an important element of the upland habitat mosaic.

- Gritstone walls create the distinctive field pattern which is highly visible on the sloping valley sides. The stone walls provide shelter and habitat for wildlife, and are also of considerable historical/ cultural interest.

G: Wooded Rural Valleys

The steep-sided wooded valleys, which dissect the high South Pennine moorland, are a special feature of the area. They have a secluded, intimate character derived from the deeply incised topography and abundant woodland which clothes the valley sides often blocking the sky from view. Although they exist in close proximity to the densely urbanised and industrial valleys, these side valleys are largely hidden and inaccessible except by foot. Their depth and extent is surprising and creates the sense of a hidden, secret landscape. The swift-flowing streams which tumble over the hard gritstone rocks are edged with a luxuriant carpet of mosses and ferns. These waters once provided the power for the early industrialisation of the region and the side valleys are lined with the remains of former mill sites.

Key Environmental Features

- A secluded, `hidden' intimate and tranquil character created by the incised landform, densely wooded slopes and absence of modern development.

- Distinctive incised landform with stepped terraces and a narrow valley floor.

- Fast flowing, moss and fern edged, streams cut down into the bedrock.

- Waterfalls are a characteristic feature where the streams cut alternating hard and soft layers of the underlying Millstone Grit geology.

- A mosaic of wetland habitats including freshwater streams, damp pasture and meadows, marsh and millponds on the valley floor.

- Thick broadleaved woodland including ancient woodland of high nature conservation value, clothes the valley sides.

- Patchwork of light and shade created by the juxtaposition of woodland and pastures.

- Local areas of landslip on the steep valley sides expose important geological sites and create a distinctive landscape feature.

- Strings of now derelict water-powered mills with associated features including mill ponds and races occur along the valley floor and reflect the emergence of early industrialisation.

- Archaeological features related to woodland management, such as charcoal hearths are common.

I: Reservoir Valleys

The valley reservoirs, constructed in the mid-late nineteenth century to supply water for Lancashire's growing urban population, create a distinctive landscape type. The valleys are dominated by a series of large level expanses of water and associated engineered landforms of bunds and embankments. The Victorian landscape is evident in the form of the coniferous plantations, gothic detailing and ornamentation, and sturdy dressed stone walls. Today, the valleys are predominantly rural in character with attractive areas of pasture and broadleaved woodland surrounding and linking the waterbodies. The valleys with their extensive woodlands and plantations have the capacity to absorb relatively high numbers of people (for recreation) from the surrounding urban areas, without becoming overcrowded and recreational use is now an important influence on landscape character.

Key Environmental Features

- Open valley profile with gently sloping sides, influenced by glacial activity.

- Dominated by numerous large reservoirs with characteristic ornate Victorian detailing. The reservoirs provide water resources, support important populations of wintering wildfowl and waders, and are a focus for recreation.

- A well-wooded landscape with broadleaved and coniferous plantations bordering and linking reservoirs. The extensive woodland gives the area a high capacity for visitors.

- An absence of settlement, except in Bradstock Brook where small linear settlements are found. Acquisition by the water boards has removed most of the evidence of pre-existing land use.

- Evidence of historical mineral extraction in the form of lead mines and sandstone workings. Many have been reclaimed and provide an important nature conservation and/or recreation resource as well as a prominent landscape feature.

- An important listed historic designed landscape at Lever Park.

K: Coalfield Edge Urban Fringe Farmland

The farmland of the coalfield edge forms part of the long eastern dip slope of the Pennines, which slopes gently from the high moorland towards the extensive urban conurbations of West Yorkshire. The slope is divided into a series of undulating ridges by small streams. The ridge top summits provide the location for a number of settlements including Denholme, Queensbury, Thornton and Shelf. Outward expansion of these settlements, which are not constrained by topography, has imposed a more suburban landscape. This 'urban fringe character' is reinforced by the dense network of roads that connect areas of development, as well as the long views to the industrial areas of Leeds and Bradford. The gritstone walls that subdivide the intervening farmland into medium/large pasture fields provide one of the few unifying characteristics with the wider South Pennines area. Elsewhere the countryside character of this eastern edge is being eroded by a combination of modern housing, pylons, communications infrastructure, mineral extraction, landfill sites and other non-agricultural and urban fringe land uses.

Key Environmental Features

- Long gentle eastern dip slope divided into a series of ridges.

- Streams and reservoirs provide important freshwater habitats.

- Fragments of species-rich grassland remain within the improved agricultural land.

- The pattern of fields enclosed by gritstone walls provides a unifying feature with the rural fringes of the South Pennines.

- Scattered remnants of ancient woodland in combination with newer areas of woodland planting plus coniferous plantations.

- Distinctive settlement pattern with the small towns and villages of Denholme, Queensbury, Thornton and Shelf situated in hilltop locations. Some retain their historic village cores and vernacular architecture relating to the textile industry.

- Long views out from the South Pennines and across the urban areas of Bradford and beyond are a characteristic feature and strengthen the connections with the city.

L: Lowland Farmland

This landscape character type can be found in the south-western fringes of the South Pennines around Bury and Rochdale. These are relatively low lying agricultural landscapes which lie above the surrounding river valleys landscapes and range in elevation from 90 to140m AOD. These landscapes are covered by till deposits, resulting in mixed drainage, with some areas of former moss landscape and frequent small streams and ponds. Land use is predominantly improved pasture grazed by sheep, cattle and horses, with some small areas of arable and also urban fringe land uses such as equestrian facilities and golf. Settlement is sparse, comprising dispersed farmsteads or isolated areas of industrial development. Field sizes are medium and fields are mainly defined by hedgerows and fences with occasional stone walls. There are few hedgerow trees and this gives rise to an open character overall; trees tend to be concentrated along the motorway corridors. These landscapes are physically fragmented by areas of development and by transport infrastructure but often have strong visual connectivity to surrounding upland areas.

Key Environmental Features

- Lowland landscape but elevated above adjacent river valleys.
- Small streams and ponds provide important habitats including sites for Great Crested Newts.
- Semi-natural woodlands along motorway corridors provide enclosure in an otherwise relatively open landscape.
- Clusters of archaeological sites remain as a result of limited suburban development including evidence of medieval settlement.
- Sparse settlement contrasting with densely populated areas adjacent.
- Views to surrounding upland landscapes.

M: Industrial Lowland Valleys

These valley landscapes are located on the outer fringes of the South Pennines where the river valleys broaden, a distinctive floodplain emerges and the surrounding land is lower lying. The edges of the floodplains may be defined by low but steep bluffs which are often cloaked in woodland. Within the valley floor the course of the river may meander or become braided and the river may be paralleled by other transport infrastructure such as roads, railways and canals. In many areas the valley floor has been developed, frequently by industrial units which are often large in scale and may obscure the valley floor and course of the river. Elsewhere there may be remnant patches of open space, agriculture, woodland, scrub, or more extensive areas of active or disused quarrying or landfill. Overall this landscape has an urban industrial lowland character.

Key Environmental Features

- Pronounced flat valley floor with meandering/braided river channel.
- Low valleys sides with steep wooded bluffs in places.
- Broadleaved woodland and scrub areas of some value for nature conservation.
- Distinctive vernacular in the form of old mill buildings, canals and bridges – industrial heritage.
- Green corridor created by river and woodland penetrating built up areas.

N: Rolling Wooded Farmland

Elevated, gently rolling, mixed farmland located in the east of the South Pennines. Underlying geology comprises alternating bands of shales and sandstones with frequent coal seams. This gives rise to rolling landform and mixed soils, some of which are relatively light and sandy and support arable land as well as pasture. Field patterns are medium to large scale, defined by hedgerows. Smaller, earlier enclosures occur on valley sides and around settlements while higher ground has larger, later and more regular enclosures of former moorland commons eg at Emley Moor. The landscape contains significant blocks of woodland (deciduous and coniferous) as well as shelterbelts of sycamore. Hedgerow trees add to the well-wooded character although they become less prevalent on higher ground. There is a dispersed pattern of isolated farmsteads, with some larger settlements such as Emley and Skelmanthorpe. The area is dominated by the Emley Moor TV Tower (330m) which is a notable landmark from all directions.

Key Environmental Features

- Hedgerows and trees and blocks of woodland give rise to a well-treed and wooded character.
- Woodland areas are of ecological value.
- Roadside verges are species-rich and may contain areas of bracken and gorse reflecting patches of more acidic soil.
- Attractive patterns of woodland and undulating topography give this area a scenic quality.
- Significant views from elevated locations.
- Historic settlements centred around a church but with more recent housing on the outskirts.

O: Industrial/ Business Parks

This urban type includes Victorian industrial development associated with coal mining and woollen mills as well as more recent large scale commercial sheds, distribution buildings and business or retail parks. The former developments are often built of local stone or brick and have a unity of design and scale. The latter are built of a range of materials and may form discrete and sometimes extensive areas of development on the outskirts of major settlements or along river valleys (where they occur in lowland river valleys they are classified under the Industrial Lowland Valley type – see above). Occasionally they may be located in isolated elevated locations or along motorway corridors where communications are good. Buildings are large in scale and development as a whole may also cover an extensive area.

U: Urban

The historic urban cores that can be found within the South Pennines typically are small, characterful areas at the heart of the larger settlements. A historic church and market place are often sited at the central convergence point of the principal radial routes. Most historic urban cores have a denser urban fabric than other parts of the town, with tall red brick or stone buildings and angular streets. There is a general lack of open space and vegetation, although market squares do survive in some towns. In some cases the historic core appears as an isolated island within later development. This may result from the demolition and re-planning of town centres, or from the fusion of isolated small towns by expansion of nearby settlements. Often the historic core is only visibly represented by the street pattern and property boundaries. Apart from churches and castles, the earliest visible fabric are rare 16th and 17th century buildings, but typically the oldest buildings of the historic core are 18th or 19th century. Overall, the most enduring feature of the historic urban cores is the organic, winding arrangement of streets and alleys and the distinctive character of historic public buildings.

In surrounding residential and suburban areas, the townscape includes a wide variety of architectural styles and layouts. Areas dating from the Victorian and Edwardian periods may have a unity of architectural character associated with stone or brick terraces or tree lined streets. In the central part of the South Pennines local gritstone is the main building material, while to the south and west, especially in Rochdale, there is a predominance of red brick.

More modern residential and suburban areas tend to be characterised by a spacious pattern of streets, low buildings, garages and gardens, although there are also examples of high-rise tower block estates, with communal amenity grassland and extensive parking. Early and mid 20th century suburban housing is typically semi-detached, built of brick or stone, and arranged in crescents and wide streets with large front and rear gardens. This type of suburban housing often forms ribbon development along the principal urban routes, with more recent housing estates set behind. 1950s to 60s estates tend to have predominantly straight streets with some cul-de-sacs and with gardens and garages. Since the 1970s, housing development has been concentrated in relatively dense estates with cul-de-sac layouts, curved streets, small gardens and garages and there is often a mixture of many different styles, frequently pastiches of old styles. The use of many different materials (often not of

local origin) and standardised architectural detailing has tended to result in some loss of regional identity; the same house designs recur across the whole country.

Annex 2: Landscape Character Areas in Bury, Rochdale, Calderdale and Kirklees

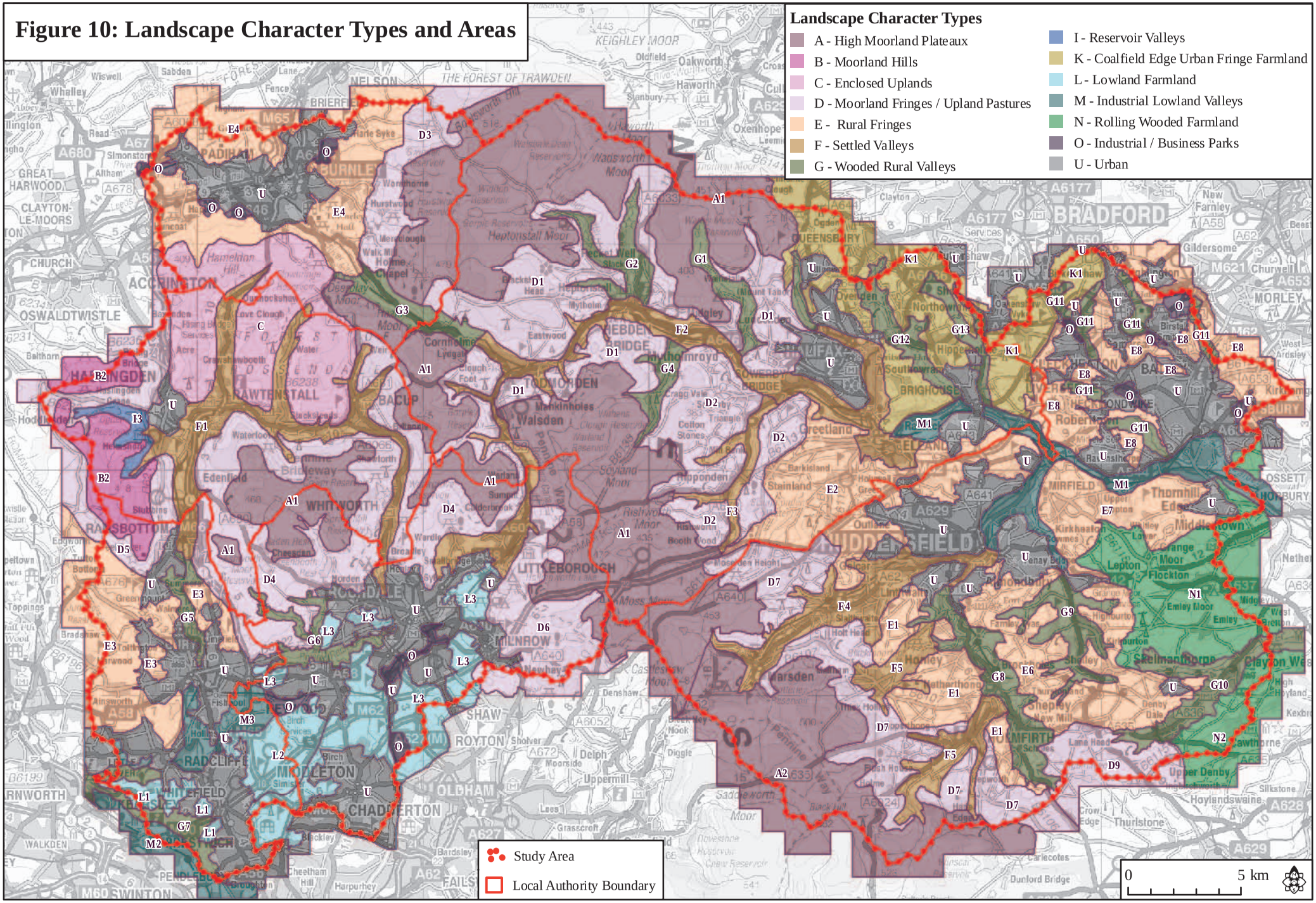
The text below describes the landscape character areas in Bury, Rochdale, Calderdale and Kirklees, hence providing complete and consistent, albeit basic, landscape character assessment coverage for all the districts within the study area.

Where available, descriptions have been taken from the SCOSPA landscape character assessment, which covers parts of these districts[24]. In other cases new descriptions have been prepared, drawing on any other existing landscape character assessment coverage for the district, as described in *Annex 1*.

Figure 10 overleaf is a labelled map showing the locations of all the LCTs and LCAs across the study area as a whole. The numbering system is consistent with that used in the SCOSPA landscape character assessment.

[24] Where material from the SCOSPA assessment has been reproduced, a few minor changes have been made to address obvious errors or inaccuracies.

Figure 10: Landscape Character Types and Areas



Bury

B2: West Pennine Moors

The West Pennine Moors are aligned perpendicularly to the main Pennine ridge. The moorland occurs in number of discrete blocks at Withnell Moor, Smithills Moor, Turton Moor, Anglezarke and Rivington Moors, Oswaldtwistle Moor and Holcombe Moor. They are generally slightly lower in altitude than those of the main South Pennine spine, although include some notable high points, for example at Winter Hill on Rivington Moor. The hills can be seen from long distances and form a significant backdrop to the surrounding towns of Bury, Bolton and Blackburn. The area is of considerable archaeological importance reflecting past land use and settlement history and has been subject of considerable archaeological research. On the West Pennines the sense of remoteness and wildness is diminished as a result of the relatively small area of the individual moorland blocks and the dramatic and panoramic views across the adjacent urban areas of the Lancashire Plain and the Greater Manchester conurbation. The accessibility of the moorlands to the surrounding towns means that they are a very important recreational resource.

E3: Tockholes - Rivington - Edgeworth Fringe

The farmed fringes extend across the long southern slopes of the West Pennine moors forming a transition area between the moorland summits and the extensive urban areas of Bolton and Bury which occupy the land to the south. They also include the lower agricultural land in the area around Tockholes. Tree cover is significant throughout the area with ash, oak, willow and sycamore found in large woodland blocks, clumps, shelterbelts and along field boundaries. Small to medium sized coniferous plantations are also a common feature and extend out from the reservoir valleys. Pasture predominates as the main land cover, although some areas appear to have been taken out of agricultural use and are unmanaged, with areas of rough grassland beginning to scrub up or utilised as horse paddocks. The decline in farming is also reflected in the condition of the enclosing stonewalls, many of which are in a poor state of repair. In the past the area has been quarried, and the remains, including numerous slag heaps, are apparent in the landscape as, for example, around Withnell. The area is crossed by a network of narrow rural lanes which connect the scattered settlements, hamlets and farmhouses. At the highest parts of this area there are long views out over the large urban conurbation on the lower land to the south. This area, in common with many of the rural fringes, is vulnerable to increasing pressures from the surrounding urban areas.

G5 River Irwell Valley (Ramsbottom - Bury)

The River Irwell Valley between Ramsbottom and Bury is orientated north-south and is an inward looking pastoral landscape which is well wooded in the north and forms a green corridor into the heart of Bury. The woodland is both ancient e.g. Broad Hey Wood and more recent Forestry Commission planting while the valley sides are gently sloping with small to medium fields defined by hedgerows. To the south the valley narrows and urban development has infringed although the Burrs Country Park provides easy access to the valley landscape from urban areas. The East Lancashire railway line runs north-south through the valley.

G7 Irwell and Croal River Valleys

These two river valleys are located south of Radcliffe and north of Swinton. The Irwell has steep southwest sloping valley sides which are deeply incised by tributary streams that drain into the main river and are heavily wooded with ancient woodlands and Forestry Commission woodland. The tributary Croal River is orientated east-west and joins the Irwell at Nob End. Within this valley weirs are a recurring feature along the meandering watercourse. These valley landscapes are important for recreation offering a rural and tranquil environment and include the Irwell Sculpture Trail and Prestwich Forest Park. On the more open slopes pasture predominates and pony paddocks are common while in the more elevated areas there are views southwards across the developed areas of Swinton.

L1 Radcliffe – Whitefield Southern Fringes

This area forms open farmed fringes on the edges of the urban conurbations of Radcliffe and Whitefield and is located adjacent to river valley slopes. This is a gently undulating to flat landscape comprising glacial deposits and traversed by pylons and road infrastructure. Land use is dominated by pasture and grazing with a high incidence of pony paddocks defined by hedges and post and wire

fences. Other urban fringe land uses are also common including golf courses and there is a general neglected feel to the area. In the west there are some water bodies resulting from former mineral extraction. There are also views out across the valleys to the wider developed landscape.

L2 Whitefield - Heywood Lowland Farmland Fringes

This landscape forms an area of relatively open rural fringe which is gently undulating comprising glacial deposits and dissected by numerous small streams e.g. Whittle Brook which form shallow depressions in the landform. Although relatively low topography the area has an open and elevated character above the surrounding valleys and is exposed in places with little woodland cover. As with many rural fringe landscapes, the area retains its rural character with small to medium pasture fields divided by gappy hedges and post and wire fencing and a dispersed pattern of farms, although in places there is a neglected feel. This is reinforced by the visual fragmentation of the area where industrial development has occurred and where the adjacent distribution park to the north exerts and influence. Also the M66 and M62 road corridors have an urbanising influence on the area.

L3 Chadderton - Milnrow Lowland Farmland Fringes

This area forms an undulating and sometimes hilly landscape comprising glacial deposits which acts as a valuable rural backdrop to the adjacent urban areas of Chadderton and Milnrow. Land use varies from pasture to golf courses with some areas of parkland where there is generally a higher incidence of tree cover e.g. Hopwood Hall and Heaton Park. There are also patches of scrub development in some areas. Although dissected by the A627 (M), A664 and pylons it accommodates these developments well due to topography and vegetation and retains a strong sense of rural character and intactness. This landscape is valued as a recreational resource and contains the Tandle Hill Country Park and the Rochdale Way and Oldham Way long distance routes.

M2 River Irwell Valley Floor Kearsley – Pendlebury

This is an area of valley floor along the River Irwell between Kearsley and Pendlebury. The valley floor is flat to gently undulating defined by the north by sloping and wooded valley sides and more gentle developed slopes to the south. Within the valley floor the river is overshadowed by development at Stoneclough, sewage works, industrial developments, substation and a prison. Along the south of the valley floor is a railway and the central part of the valley is crossed by the M60. Although these developments exert a strong urbanising influence this is countered to some degree by the Clifton Country Park and Irwell Sculpture Trail.

M3 River Irwell Valley Floor – South Bury

This area forms the valley floor landscape along the River Irwell and tributaries to the south of Bury. Meandering water channels often flanked by strips of woodland area unifying features of the area although their visual and physical presence has been diminished by development e.g. M66, sewage works, industrial estates and residential areas as well as extensive areas of former and existing mineral extraction e.g. Pilsworth South sand quarry. This area has an urban and rural fringe character.

Rochdale

Al: South Pennine Moors

The South Pennine Moors are the core of the study area and form a long high plateau extending from Rishworth Moor in the south to the vast expansive sweep of high uninhabited moorland around Oxenhope Moor and Boulsworth Hill in the north. The plateau is subdivided into two main blocks, to the north and south, by the valley of the Calder, while to the west there are three smaller isolated, fragmented moors at Scout Moor, Shore Moor and Heald Moor. It is a large scale sweeping open landscape with strong skyline ridges and expansive views offering a sense of remoteness, isolation and wildness. These special perceptual qualities are reinforced by the proximity to the surrounding urban areas and intersecting industrial valleys. The moorland contains a wealth of natural and cultural -features and forms the- -main part- of the SPA supporting internationally important bird populations. The wild landscape has been a powerful influence and inspiration on the writings of the Brontë sisters. The novels of Wuthering Heights and Jane Eyre, among others, create an extraordinary literary landscape with a strong image in the minds of people worldwide. The South Pennine Moors have a special quality of rugged enduring grandeur, although the landscape is nevertheless very vulnerable.

D4: Scout Moor and Shore Moor Fringe

This character area occurs largely within Rossendale and Rochdale, edging the smaller, fragmented moorland blocks of Scout Moor and Knowl Moor, Shore Moor and Inch field Moor and flanking the valleys containing the Irwell and the Rochdale Canal. Much of the land is at a high altitude (350m) and appears to represent a late stage of enclosure with large regular fields and robust farmhouses high up on the moor edge. In comparison, the gentler slopes down from the moors in the southern part of the area contain a number of secluded valleys such as at Cheesenden Brook and Greenbooth Reservoir. The land remains in agricultural use with both sheep and cattle grazing, although it is clear that many of these are part time holdings and the existence of the dual economy remains essential to the viability of the farms. There are strong links with the urban/industrial economy and diversification into activities such as haulage and scrap metal recycling can be found on farms in some of the highest and inaccessible parts of the area. Much of the grassland is improved and intensively managed; only fragments of the semi-natural habitats of acid grassland/damp grassland and moorland cover remain. Some small scale areas of conifer planting are also evident. The traditional stone walls are often in a poor state of repair and are supplemented by post and barbed wire fencing. Settlement comprises scattered isolated farmhouses often built at the end of long narrow lanes terminating at the moorland edge. These farm complexes frequently include large sheds/barns and makeshift structures associated with diversification activities. High quality stone underlies much of the area and quarrying has long been an important land use with a large number of both active and disused quarries at the junction with the moor. The area is characterised by a very dense network of footpaths which cross the belt of high land between the valleys and the moorland summits.

D6: Delph - Littleborough Moor Fringe

This upland area in the south of the South Pennines Area adjoins the high moorland of Chelburn Moor and Close Moss, and slopes steeply towards the towns of Rochdale and Oldham, providing long views of these urban areas from the high ground. Shallow valleys such as at Piethorne cut by streams draining the high moorland watershed intersect the steep slopes. Scattered farmhouses are concentrated on the moorland s, with fields pi grazing and silage, although some are unmanaged and are becoming rushy. Pockets of unenclosed moorland survive as, at Compton Moor, where a heather cover has been restored and there are isolated fragments of unimproved damp/marshy pasture throughout the area. Large regular stone walls define most of these fields, although many are in a state of disrepair and post and wire fencing is also common. Reservoirs are a notable feature at the junction with the unenclosed high moorland, for example Piethorne, Ogden, Castleshaw, and often occur in association with considerable conifer planting. Farming is typically marginal and horse paddocks and some makeshift farm buildings associated with diversification, are evident throughout the area. This is a landscape which is particularly vulnerable to change, especially given its proximity to the urban areas. The urban fringe character is reinforced by views of power line and pylons which are prominent across the area.

F1: Irwell (Ramsbottom, Rawtenstall and Bacup)

The River Irwell arises from moorland springs on the moorland above Bacup and flows within a narrow, high-sided valley in a westward direction to Rawtenstall and then south to Ramsbottom. Tributary streams flow southwards through Lumb and Crawshawbooth cutting the high land of the Forest of Rossendale before joining the main valley. The character area also includes the separate wider valley of the river Spodden which runs south through Whitworth. On the steepest sides of the Irwell there are outcrops of Millstone Grit creating a gorge-like landform, and in the deepest parts of the valley the north facing slopes remain in almost permanent shade. Along the valley bottom the towns of Rawtenstall, Bacup and Waterfoot merge to form a dense ribbon of urban and industrial development. The urban areas contain many fine buildings representing some of the South Pennines most important industrial -heritage. The Irwell valley is distinctive for the relatively small amount of woodland compared, for example, to the valleys to the west. Within the dense urban centres there is always an awareness of the proximity of wilder countryside with views up to the moorland edge, although in many areas extensive quarrying has disfigured the skyline view. The essential landscape character of the area is created by the juxtaposition of the deep river valley with its important areas of industrial heritage and the wild moorland.

F8: Roch (Littleborough)

The valley containing the Rochdale Canal runs southwards from Todmorden towards Rochdale. The valley is continuous with the Calder which runs westwards to Hebden Bridge. A ribbon of

development extends along the whole of the valley floor and incorporates the village settlement of Calderbrook and extends towards Walsden (F2). At the southern end it incorporates the substantial development at Littleborough which forms the urban edge of Rochdale. The valley is wider than the Calder and is notable for the sparse woodland cover, with trees limited to narrow side cloughs and scattered areas of natural regeneration on areas of disturbed ground. The valley sides have, in the past, been extensively quarried resulting in a distinctive hummocky landform and areas of exposed rock face along the skyline. Much of the disturbed land has naturally revegetated and now forms an important resource of acid grassland. The character of the quarried land is very different, not only in terms of the landform but because the grassland is open and has lost the distinctive network of boundary walls.

G6 River Roch and Tributaries

This area comprises the deeply incised and heavily wooded River Roch Valley between Heywood and Rochdale and its associated tributaries which flow in from the north. The River Roch meanders through the narrow valley flanked by notable steep slopes of ancient woodland and areas of more recent planting. The tributary valleys are unsettled while the main Roch Valley contains the small historic villages of Hooley Bridge and Crimble and the whole area retains a high rural character and sense of tranquillity. The Rochdale Way passes through this area offering access to a secluded and rural valley close to urban areas. In places this valley landscape is traversed by pylons.

L2 Whitefield - Heywood Lowland Farmland Fringes

This landscape forms an area of relatively open rural fringe which is gently undulating comprising glacial deposits and dissected by numerous small streams e.g. Whittle Brook which form shallow depressions in the landform. Although relatively low topography the area has an open and elevated character above the surrounding valleys and is exposed in places with little woodland cover. As with many rural fringe landscapes, the area retains its rural character with small to medium pasture fields divided by gappy hedges and post and wire fencing and a dispersed pattern of farms, although in places there is a neglected feel. This is reinforced by the visual fragmentation of the area where industrial development has occurred and where the adjacent distribution park to the north exerts and influence. Also the M66 and M62 road corridors have an urbanising influence on the area.

L3 Chadderton - Milnrow Lowland Farmland Fringes

This area forms an undulating and sometimes hilly landscape comprising glacial deposits which acts as a valuable rural backdrop to the adjacent urban areas of Chadderton and Milnrow. Land use varies from pasture to golf courses with some areas of parkland where there is generally a higher incidence of tree cover e.g. Hopwood Hall and Heaton Park. There are also patches of scrub development in some areas. Although dissected by the A627 (M), A664 and pylons it accommodates these developments well due to topography and vegetation and retains a strong sense of rural character and intactness. This landscape is valued as a recreational resource and contains the Tandle Hill Country Park and the Rochdale Way and Oldham Way long distance routes.

Calderdale

Al: South Pennine Moors

The South Pennine Moors are the core of the study area and form a long high plateau extending from Rishworth Moor in the south to the vast expansive sweep of high uninhabited moorland around Oxenhope Moor and Boulsworth Hill in the north. The plateau is subdivided into two main blocks, to the north and south, by the valley of the Calder, while to the west there are three smaller isolated, fragmented moors at Scout Moor, Shore Moor and Heald Moor. It is a large scale sweeping open landscape with strong skyline ridges and expansive views offering a sense of remoteness, isolation and wildness. These special perceptual qualities are reinforced by the proximity to the surrounding urban areas and intersecting industrial valleys. The moorland contains a wealth of natural and cultural features and forms the main part of the SPA supporting internationally important bird populations. The wild landscape has been a powerful influence and inspiration on the writings of the Brontë sisters. The novels of Wuthering Heights and Jane Eyre, among others, create an extraordinary literary landscape with a strong image in the minds of people worldwide. The South Pennine Moors have a special quality of rugged enduring grandeur, although the landscape is nevertheless very vulnerable.

D l: Calder Terrace

The character area comprises the broad shelf of land that lies above the incised valley of the river Calder. It forms part of the 'internal' landscape of the South Pennines and differs from the moorland fringes on the edges of the upland, which are characterised by their extensive views out across the surrounding urban areas and flat plains beyond. The land is enclosed into small pastures by regular gritstone walls and traditional farmhouses are scattered across the area. In views across the terraces the valley of the River Calder is virtually hidden from view – only occasional glimpses of the dense woodland which fills the deep cleft provide a clue to its existence. Apart from the points where upper wooded cloughs penetrate the terrace, and the small clumps of trees sheltering individual farmsteads, the whole area is open and virtually treeless and has a 'remote' upland character. The patchwork pattern of fields is the dominant feature of the landscape and there is a clear and sharp division with the high unenclosed moorland. The farms include important areas of in-bye land including some that are still managed as traditional hay meadows. At least visually, the upland pastures of the Calder terrace retains an intact character, although it is nevertheless very vulnerable, particularly to changes in farming practice and the pressures induced by its proximity to Halifax and Huddersfield. A large number of historic routes and packhorse trails, such as the Long Causeway, which originated as high level routes between the valleys cross this area and now provide an important part of the public Right of Way network. The stone lined tracks are an important historic artefact and a locally distinctive feature.

D2: Blackwood Common

This area lies on the spur of high land between the two tributary valleys of Cragg Vale and the Ryburn. In terms of landform and land cover this area is essentially similar to the upland pastures of the Calder terraces described above (Dl). It is distinguished by the greater degree of development, with small land holdings and numerous individual farmhouses scattered across the area. The reason for this difference is not entirely clear. The dense network of footpaths, rights of way and packhorse routes indicate the strategic importance of the area as a route between the two valleys and to the urban centres of West Yorkshire and some of the farmhouses are known to have their origins as early coaching inns on these historic routeways. Another distinction is the views towards the urban areas; the high rise developments of Sowerby Bridge and Halifax form the focus for the view along the Calder Valley.

D7: Wessenden and Meltham Moor Fringe

In the south-east part of the study area a relatively narrow band of moorland fringe connects Wessenden and Meltham Moors with the lower settled farmland, and extends across the high east-west running ridges of land that separate the valleys of the Holme, Hall Dike and Colne. The area includes improved moorland with a pattern of planned rectangular fields enclosed by stone walls and straight roads as found for example around Blackmoor, Holme and Thick Hollins Moor. By comparison more rugged farmland can be found around the valley heads and along the steep upper valley sides, where the stone walls divide the land into a patchwork of small to medium sized, often irregular, fields. The moorland fringe area is predominantly managed by sheep grazing, with some areas of in bye land still providing a hay crop although silaging is increasingly common as a means of grassland management. In contrast, some of the higher large enclosures are beginning to revert back to their former 'moorland' character with grass moorland and patches of heather. Settlement includes some scattered farms and dwellings on the exposed higher levels. Agriculture remains the dominant land use and there is little evidence of diversification into unsympathetic land uses. Overall, this area retains an intact upland character with few of the urban influences that characterise some other moorland edges

E2: Barkisland - Holwell Green

This area forms the rural farmed edge to the south of Halifax and west of Huddersfield. It has a fairly complex undulating landform comprising a series of ridges, summits, steep slopes and valleys. The field pattern also varies considerably and includes a small irregular, patchwork pattern as well as later rectangular upland enclosures on the high areas such as around Norland Moor and Pole Moor. There is substantial tree cover with thin woodland strips along the stream sides on the valley floors, steeper slopes and along boundaries, with sycamores, ash, willow and conifer species particularly common. A dense network of narrow lanes cross the area and these are connected by a series of main roads. It is a well-populated landscape with a high density of settlement including small clusters of buildings and

hamlets, linear developments along the roads as well as scattered farm buildings. The area is obviously subject to pressures emanating from the adjacent urban areas, although the valleys and folds frequently conceal pockets of attractive, secluded rural landscape.

F2: Calder (Walsden, Todmorden, Hebden Bridge, Mytholmroyd)

The valley of the Calder runs from Todmorden, in the west to Sowerby Bridge and beyond in the east. It is a deep, steep sided densely wooded valley, which from its floor feels particularly enclosed. The action of glacial meltwater has deepened the Calder, forming the characteristic steep sided `valley within a valley profile', with the river flowing in a deep gorge. Such is the depth of the valley and sense of confinement, compounded by the dense woodland cover, that from the top of the slopes most of the valley remains hidden. The river and its tributaries played a central role in the development of industry in the area, providing an important transport route and a powerful influence in the location of the settlements. The valley's importance as a transport corridor has endured, with routes parallel to the river in the form of a major road (A6033), the Rochdale Canal and the railway. The market towns of Todmorden and Hebden Bridge, are attractive thriving centres, exhibiting their industrial past and former wealth through the mills, grand buildings, and the characteristic architecture, such as the 'double decker' houses. To the eastern end of the valley around Mytholmroyd and Sowerby Bridge extensive postwar development gives the valley a more urban character. The upper Calder valley is distinctive in that the settlement centres are clearly defined and separated by important areas of intact countryside with areas of inbye pasture, enclosed by gritstone walls and extensive blocks of ancient woodland filling the side cloughs.

F3: Ryburn (Sowerby Bridge, Ripponden)

The River Ryburn drains the high land of Rishworth Moor and flows in a northerly direction to join the Calder Valley at Sowerby Bridge. It is a narrow thickly wooded valley and forms an important transport corridor creating the route for the main A58 road and a railway line (now dismantled). The road is lined by a narrow band of linear development, and small settlement centres at Rishworth, Ripponden, Kebroyd and Triangle which retain elements of their industrial heritage including a number of disused mill buildings and chimney stacks. The character of the Ryburn valley is still predominantly rural with the valley slopes covered by thick bands of broadleaved woodland and the distinctive patchwork of pastures. Generally, settlements are confined to the valley floor and do not climb the side slopes, unlike those of the Irwell and Calder Valleys. The rural character is reinforced by the avenues of beech trees that line the road corridor.

GI: Luddenden Dean

Luddenden Dean is a secluded side valley of the Calder. The deep wooded ravine runs north-south from Dean Head reservoirs on Worley moor to Luddenden Foot in the Calder Valley. It is an unspoilt valley with the extensive woodland of Jerusalem Woods along the valley bottom, small pasture fields and scattered cottages and farmsteads. The banks of the fast flowing stream contain evidence of former water powered mill sites.

G2: Hebden Dale and Crimsworth Dean

This network of densely wooded valleys and tributaries of the swift flowing Hebden Water cut through the high moorland and valley terraces to the north-west of Hebden Bridge. They are lush tree-filled valleys and contain important chains of wet pastures along the valley floors. The woodland frequently extends to the skyline and creates an enclosed intimate valley character which is reinforced by the exposed rock/crag edges along the top of the valley. In addition to the ancient upland oak woods the valley also contains plantings of oak, Scots pine and beech which relate to a nineteenth century ornamental scheme. The valleys are an important refuge for a population of red squirrel. Gibson Mill, in the heart of Hebden Dale, one of the few remaining cotton mills, has been restored by the National Trust as a visitor centre. The valleys are an important local landscape and are well used for recreation providing attractive footpath routes linking the settlements of the Calder Valley to the upland pasture and high moorland.

G3: Cliviger Gorge

The Cliviger Valley straddles the Lancashire/Yorkshire borders. This dramatic gorge was carved out by melt waters from the ice sheet covering the Lancashire Plain. It is one of the most spectacular examples of a glacially over-deepened valley in the Central Pennines and a well-loved local landscape. The incision of a glacial meltwater channel down the valley has caused the tributary

streams to be left 'hanging' and these are currently actively cutting down into the bedrock, producing numerous natural exposures of Carboniferous rocks which are of great geological interest and have in the past been exploited for coal. The steep slopes also contain extensive areas of landslip which create a very distinctive landform. Towards Burnley the valley becomes narrower and more steep sided with rocky outcrops and crags such as at Thieveley Scout exposed on either side. Cliviger, unlike the other side valleys of the Calder, contains relatively little woodland, although there are important small blocks around the settlements of Holme Chapel and Cornholme. There is a scattered settlement along the valley floor following the line of the Burnley-Todmorden Road.

G4: Cragg Vale

The fast flowing water of Cragg Brook has its origins on Soyland Moor and has carved out Cragg Vale which cuts down to join the River Calder at Mytholmroyd. The valley has a relatively wide floor and steep sides and the landform widens and opens out towards the valley head. It is densely wooded, predominantly with deciduous trees although lines of mature beech originating from the last century and occasional conifer plantations are also evident. Land cover also includes heather moorland at the valley head and pastures on the lower valley sides. A transport route has developed adjacent to the watercourse, and is lined with scattered development. A number of disused mill structures suggest an industrial history for this valley. In spite of the presence of the road and modern development the vale retains its quiet and secluded character.

G12 Shibden Dale

Shibden Dale a deeply incised valley which is orientated north-south through which Red Beck flows. This valley is narrow defined by steep valley sides which are wooded and widening to contain a narrow valley floor in the lower reaches. Although settled with small villages and dispersed farms on the valley sides it is generally deeply rural. On the valley sides there is a patchwork of small to medium scaled fields defined by stone walls and hedges and supporting pastoral land uses. Road infrastructure and pylons traverse this landscape but the dramatic topography and rural character remains dominant.

G13 Clifton Beck

Clifton Beck is a north-south orientated river valley which drains the upland Coalfield Edge to the north. It comprises steep wooded valley sides with areas of wooded pasture and pasture fields defined by stonewalls and hedges. Overall it is a small scale landscape which feels deeply historic. To the south of Bailiff Bridge settlements becomes more prevalent.

K1

This landscape type is only found in one geographic area (refer to type K Coalfield Edge Urban Fringe Farmland for description).

M1 Calder Valley Floor

The Calder Valley Floor runs between Elland and Huddersfield eastwards to Horbury and beyond the study area boundary. This area comprises the flat to gently undulating valley floor of the River Calder which sits within a well defined valley that broadens and widens in places where there are confluences with tributary rivers and valleys. This landscape has been significantly developed containing extensive areas of industrial ‘sheds’ which block views across the valley and create a strong horizontal pattern broken in places by occasional chimneys. In some areas where there are views of the valley sides above they form a wooded backdrop and provide a setting to the development and areas of housing. Within the valley floor there are various numerous railway lines and road corridors. From elevated areas there are views across this development. The river itself is not visually dominant in this landscape.

Kirklees

Al: South Pennine Moors

The South Pennine Moors are the core of the study area and form a long high plateau extending from Rishworth Moor in the south to the vast expansive sweep of high uninhabited moorland around Oxenhope Moor and Boulsworth Hill in the north. The plateau is subdivided into two main blocks, to the north and south, by the valley of the Calder, while to the west there are three smaller isolated, fragmented moors at Scout Moor, Shore Moor and Heald Moor. It is a large scale sweeping open

landscape with strong skyline ridges and expansive views offering a sense of remoteness, isolation and wildness. These special perceptual qualities are reinforced by the proximity to the surrounding urban areas and intersecting industrial valleys. The moorland contains a wealth of natural and cultural features and forms the main part of the SPA supporting internationally important bird populations. The wild landscape has been a powerful influence and inspiration on the writings of the Brontë sisters. The novels of Wuthering Heights and Jane Eyre, among others, create an extraordinary literary landscape with a strong image in the minds of people worldwide. The South Pennine Moors have a special quality of rugged enduring grandeur, although the landscape is nevertheless very vulnerable.

A2: North Peak (Wessenden and Meltham Moors)

The North Peak Character Area forms the southern part of the South Pennines ridge and lies partly within the Peak District National Park It comprises an area of wild, open and more or less continuous moorland including Wessenden Moor, Meltham Moor. The open plateau is composed of a series of wide ridges, subdued by a deep layer of blanket peat and rising into a series weathered gritstone tors. The area includes a number of key geological sites, with the hard rib of gritstone that forms Blackstone Edge forming a particularly distinctive landscape feature. The sweeping heather covered ridges create the sense of a landscape on a vast scale with expansive views and a strong sense of remoteness. Small water storage and canal feeder reservoirs are common at the junction of the moorland edge and the enclosed fringes. Otherwise, the landscape is devoid of large scale developments.

D7: Wessenden and Meltham Moor Fringe

In the south east part of the study area a relatively narrow band of moorland fringe connects Wessenden and Meltham Moors with the lower settled farmland, and extends across the high east-west running ridges of land that separate the valleys of the Holme, Hall Dike and Colne. The area includes improved moorland with a pattern of planned rectangular fields enclosed by stone walls and straight roads as found for example around Blackmoor, Holme and Thick Hollins Moor. By comparison more rugged farmland can be found around the valley heads and along the steep upper valley sides, where the stone walls divide the land into a patchwork of small to medium sized, often irregular, fields. The moorland fringe area is predominantly managed by sheep grazing, with some areas of in bye land still providing a hay crop although silaging is increasingly common as a means of grassland management. In contrast, some of the higher large enclosures are beginning to revert back to their former 'moorland' character with grass moorland and patches of heather. Settlement includes some scattered farms and dwellings on the exposed higher levels. Agriculture remains the dominant land use and there is little evidence of diversification into unsympathetic land uses. Overall, this area retains an intact upland character with few of the urban influences that characterise some other moorland edges

D9: Low Common – Royd Moor Fringe

This is an expansive moorland fringe area above Hepworth and Denby Dale which extends southwards beyond Kirklees District. The area includes improved moorland used for grazing with a visually strong and intact pattern of medium to large scale stone wall enclosures. It differs from other moorland fringe landscapes to the west in that it does not form an immediate foreground to the higher moorland plateaux of the Dark Peak, which lie further away to the southwest. Nevertheless it sits above adjacent valleys forming distinct stepped ridges in the west and lends an important backdrop to settlement. Away from the edges this landscape is open and simple and contains wind farm development, masts and reservoirs.

E1: Holmfirth – Meltham

The gentle dip slope on the eastern side of the South Pennines creates a relatively broad band of rural fringe within Kirklees. This edge of the Pennines is composed of a series of sloping ridges intersected by the settled valleys of the Colne, Holme and Hall Dike. The land shelters in the lee of Saddleworth and Wessenden Moors and abundant woodland thrives in the hollows and folds in the landform. There are also several shelterbelts, small plantations and areas of natural regeneration which all contribute to a more enclosed character. Views are generally controlled by rolling landform. Farming is the dominant land use with grazed pasture contained by an intricate network of stone walls creating the distinctive `patchwork' field pattern. Between the valleys parts of the plateau, such as Hanley Moor and Netherton Moor, are characterised by divisions of long rectangular fields and a network of straight planned roads which contrast with the older irregular fields and winding lanes. The stone

walls, throughout, are generally in a good condition. This is a settled, domestic landscape - most of the development is concentrated in the valley settlements, although there are some areas where the development edge has encroached out onto the higher slopes, for example at Meltham, Honley and villages such as Netherthong. Scattered farms, individual dwellings and hamlets cover the slopes. The area retains an intact and attractive rural character although is nevertheless vulnerable, particularly to changes in farming practice. Some areas are no longer farmed and are now managed as horse paddocks, while in others agricultural management has intensified with a switch to intensive grassland management for silage. Proximity to Huddersfield also creates pressures for development.

E2: Barkisland - Holwell Green

This area forms the rural farmed edge to the south of Halifax and west of Huddersfield. It has a fairly complex undulating landform comprising a series of ridges, summits, steep slopes and valleys. The field pattern also varies considerably and includes a small irregular, patchwork pattern as well as later rectangular upland enclosures on the high areas such as around Norland Moor and Pole Moor. There is substantial tree cover with thin woodland strips along the stream sides on the valley floors, steeper slopes and along boundaries, with sycamores, ash, willow and conifer species particularly common. A dense network of narrow lanes cross the area and these are connected by a series of main roads. It is a well-populated landscape with a high density of settlement including small clusters of buildings and hamlets, linear developments along the roads as well as scattered farm buildings. The area is obviously subject to pressures emanating from the adjacent urban areas, although the valleys and folds frequently conceal pockets of attractive, secluded rural landscape.

E6 Fenay Beck Valley Rural Fringes

This area surrounds the incised wooded valley of Fenay Beck and forms an intact elevated fringe farmland between this valley and Holme Valley. As such it forms a ridge of higher ground as well as a foreground to Emley Moor to the east. This pastoral farmland slopes towards the valleys and the most elevated areas are open and visually prominent and are often associated with landmark features such as Castle Hill Tower which looks over Huddersfield and the folly at Green Side. This landscape may appear well wooded with shelterbelt and plantations as a result of parkland influences and intervisibility with the adjoining wooded valleys. Rural villages sit within this landscape overlooking the valleys and church towers e.g. Thurstonland and Farnley Tyas can act as local landmarks. The landscape is traversed by a dense pattern of winding rural lanes and is generally in good condition.

E7 Emley Moor Northern Fringes

This area forms the northern pastoral fringes to Emley Moor and comprises a relatively complex topography incised by small streams although broadly it slopes in a northerly direction. Its elevation and often open character afford views northwards over the conurbations of Mirfield, Batley and Dewsbury. This landscape has a settled character containing small historic villages some of which have grown substantially with recent development e.g. Kirkheaton. Church towers can act as local landmarks e.g. Hillside and Whitley Lower as does the dominance of the Emley Moor TV tower which hovers above this landscape. Around Upper Hopton the influence of Hopton Hall and parkland makes a particular contribution to the area resulting in a higher incidence of broadleaved woodland. Pylons traverse this landscape and are a reoccurring feature.

E8 Batley - Dewsbury Rural Fringes

This area comprises elevated farmland which forms a fringe to the urban area of Batley and Dewsbury. The area has a fragmented character including land uses such as country parks, golf courses, landfill and past mining, pony paddocks and pasture fields defined by stone wall enclosures creating a medium scaled pattern. The area is traversed by minor lanes as well as major roads and rail corridors. Overall it has a settled character and the most elevated areas can be open and afford views over adjoining developed areas.

F4: Colne (Slaithwaite, Marsden)

The river Colne runs through a rugged, fairly broad valley in a north-easterly direction towards Huddersfield. At the head of the valley, to the west, the landform opens out to form a wide moorland basin, which receives numerous tributaries draining the heights of Wessenden and Marsden Moors. The moorland encloses the town of Marsden, and there are strong connections between the valley settlements and the moors. Along the valley sides the steep rugged slopes support upland farming with a patchwork of small pasture fields enclosed with gritstone walls. Heather fringes the steepest

edges and areas of landslip contributing to the rugged, moorland character of this valley. In the lower parts of the valley, towards Huddersfield, urban fringe elements are more common with hobby farms and horse paddocks apparent. Only remnants of the former woodland cover remain in this valley, with trees limited to the sheltered hollows and creases in the valley sides and around individual farmsteads (the extensive blocks of woodlands that characterise the valleys in the central part of the South Pennines are absent). Scattered farmhouses are dotted along the valley sides while the valley floor contains substantial development in centres at Slaithwaite and Marsden. The historic cores of these towns have been surrounded by considerable post-war development, which extends up the valley sides. Outside these centres the valley has a very rural nature which distinguishes it from many of the other South Pennines valleys. At the eastern end of the valley, development related to the post-war expansion of Huddersfield is dominant and includes substantial new blocks of development such as Linthwaite on the valley side. By comparison, to the west the valley retains a more remote 'moorland' character. The valley is an important communications route and carries road, rail and water links into Lancashire with the viaduct at Slaithwaite forming a particularly dramatic feature. The landscape of the Colne Valley and the surrounding moorland is evocatively described in the writings of the poet Simon Armitage, including his most recent book, 'All Points North'.

F5: Holme and Hall Dike (Holmfirth and Meltham)

The Holme and its tributary the Hall Dike form steep sided valleys to the south of Huddersfield. Both are more sheltered, 'softer' and lacking the strong moorland influence associated with the Colne. The valley of the Hall Dike is characterised by generously wooded slopes and farmland on the lower slopes and valley floor. The lowland oak woods including Honley Wood and Spring Wood represent an important ancient woodland resource. The Holme Valley, by comparison, has less woodland although planting along the roadside perpetuates a wooded feel. The valley slopes support upland sheep farming with improved grassland on the lower slopes and unimproved grassland in the steeper areas. The condition of the stone wall boundaries varies although the farmland in this area generally has an intact well maintained appearance. Both valleys are characterised by fairly extensive development although this is masked by the steep contours and thick woodland that serve to contain views. The small towns include Holmfirth, Holmbridge, Thongsbridge along the valley floor and the valley settlements of Netherthong and Upperthong in the side valleys. There are frequent buildings between settlement centres and in some areas development has extended out from the valley setting and up onto the surrounding hillslopes, such as at Meltham. The landscape of the Holme Valley has been epitomised in popular culture as 'Summer Wine Country'.

G8 Holme River Valley

The Holme River Valley is a secluded incised wooded valley orientated north-south and extends a green corridor into the southern fringes of Huddersfield. Its eastern valley sides are particularly steep and this along with the predominance of woodland gives rise to an inward looking and confined character. Settlement nestles on the valley floor and lower valley slopes and is historic e.g. Hepworth and Thongbridge. Transport corridors also run within the valley bottom although the dramatic valley sides and woodland remain dominant despite the development.

G9 Fenay Beck Valley and Tributaries

This river valley forms a distinctive dendritic pattern, the main valley orientated north-south with tributary valley arms to the east and west. This is a deeply incised, densely wooded and dramatic valley that extends into the southern fringes of Huddersfield. Although settled with historic villages e.g. Kirkheaton and Highburton much of it is free from development with the valley sides either being inaccessible or accessed by narrow rural lanes. The wooded steep slopes comprise a mix of both broadleaved and conifer plantation.

G10 River Dearne Valley

This river valley forms a gentle low lying area between Emley Moor and the rolling wooded landscape to the south-east. It has an intact wooded character and is heavily settled with historic villages which have expanded along the valley e.g. Clayton West and Denby Dale. These settlements have a strong vernacular of stone buildings and reflect earlier association with mining and industry. The Kirklees light railway runs through the northern tributary valley and the Dearne Way long distance path connects Bretton Country Park and moorland fringe around Upper Cumberworth.

G11 Batley Fringe Incised Valleys
This area comprises the small stream valleys which penetrate the urban fringes of Batley forming shallow depressions in the surrounding fringe farmland. These valleys support a mixture of pasture and woodland and can have an enclosed, rural, secluded character despite their proximity to urban areas. They are generally unsettled and often inaccessible by road but particularly valued for recreation and contain numerous footpaths and the Oakwell Country Park.

M1 Calder Valley Floor
The Calder Valley Floor runs between Elland and Huddersfield eastwards to Horbury and beyond the study area boundary. This area comprises the flat to gently undulating valley floor of the River Calder which sits within a well defined valley that broadens and widens in places where there are confluences with tributary rivers and valleys. This landscape has been significantly developed containing extensive areas of industrial 'sheds' which block views across the valley and create a strong horizontal pattern broken in places by occasional chimneys. In some areas where there are views of the valley sides above they form a wooded backdrop and provide a setting to the development and areas of housing. Within the valley floor there are various numerous railway lines and road corridors. From elevated areas there are views across this development. The river itself is not visually dominant in this landscape.

N1 Emley Moor
This area forms an elevated landscape comprising Grange Moor, Flockton Moor and Emley Moor. Although rising above surrounding landscapes, the moors have lost their moorland character and have been enclosed by a regular, medium scale, pattern of stone walls and hedges. The area supports pasture and arable land use. Woodland cover is scarce, comprising shelterbelts or small copses; and overall the area has an open and exposed character. The land is gently undulating with steeper slopes to the west and south. Mining influences are reflected in the settlement pattern – villages often occurring in open elevated locations e.g. Emley. There are notable areas of former iron workings to the east. The TV tower on Emley Moor is a dominant and defining vertical feature, its considerable scale diminishing the apparent size of adjacent landscape and built features.

N2 Cawthorne Park
This area forms gently rolling wooded farmland to the south-west of the River Dearne Valley and extends beyond the Kirklees District. It has a strongly wooded character (deciduous and conifer) with medium scale fields supporting mixed farming. The combination of these elements and patterns gives rise to a visually balanced and 'blocky' character which contrasts with other upland fringe farmland areas. A dispersed pattern of farms and granges is the predominant settlement pattern along with occasional historic villages.

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Annex 4: List of Acronyms

AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
CA	Capacity Area
CPRE	Campaign to Protect Rural England
ELC	European Landscape Convention
GIS	Geographical Information Systems
LCA	Landscape Character Area
LCT	Landscape Character Type
LDF	Local Development Framework
LVIA	Landscape and Visual Impact Assessment
MOD	Ministry of Defence
NCA	National Character Area
NE	Natural England
PPS	Planning Policy Statement
SAC	Special Area of Conservation
SCOSPA	Standing Conference of South Pennine Authorities
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest