DUMFRIES AND GALLOWAY COUNCIL

Local Development Plan

Technical Paper

SEPTEMBER 2014

Wind Energy Interim Spatial Framework Maps

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Dumfries & Galloway COUNCIL

Contents

Part 1: Introduction

1.1 The purpose of this Technical Paper is to explain the process used to formulate the Interim Wind Energy Spatial Framework Maps contained within the Local Development Plan (LDP).

1.2 Local authorities are required to produce spatial frameworks for larger windfarm developments. The purpose of the spatial framework is to guide development to appropriate locations within the region, to maximise renewable energy potential and to minimise wasted effort and resources on inappropriately located proposals (from the online guidance; *'Process for Preparing Spatial Frameworks for Windfarms',* Aug 2012).

1.3 The spatial framework maps contained within the LDP were produced following guidance contained within the Scottish Planning Policy (SPP) published February 2010 (referred to as previous SPP). At the time of the LDP examination a replacement SPP was due to be published. As a result the Examination Report included recommendations that additional text should be added to the LDP to highlight that the spatial framework maps should be subject to some refinement to reflect the new SPP and that the spatial framework maps be retained within the LDP (labelled as interim) to provide guidance until they are replaced with revised mapping through supplementary guidance

1.4 The Technical Paper explains the elements of the interim spatial framework mapping, the sieve mapping exercise undertaken and the typology approach adopted by the Council.

Part 2: Typology Approach

2.1 The previous SPP suggested that spatial frameworks are used to guide developments in excess of 20MW generating capacity but add that this approach can be extended to smaller schemes. When assessing potential impacts on the natural and cultural heritage aspects recommended for inclusion in a spatial framework (see Table 1 below for details), the physical appearance and effects of developments are likely to be more significant than pure generating

capacity. Therefore, the Council has used turbine heights rather than generating capacity to help distinguish between the extensive range of potential types of wind energy development.

2.2 Windfarms are likely to comprise of several turbines in excess of 80m in height to blade tip (some schemes may involve 50-80m turbines; although this tends to be for extensions to match existing schemes). However, recent applications have also included single or small groups of turbines in excess of 80m. These 'smaller' developments could contribute to potential cumulative effects along with 'larger' developments. They can also have significant effects over a broad area on elements such as landscape character; setting; views; etc. so, in order to be consistent and to enable assessment of potential impacts on natural and cultural heritage assets, all turbines in excess of 50 metres in height are covered by the spatial framework.

2.3 A range of criteria such as the number and distribution of turbines, blade length, colour, etc all contribute to the appearance and potential impact of developments. These are important and would be assessed as part of the development management process, however the framework concentrates on turbine height, using defined **'typologies'** (see below) to consider potential impacts and to guide turbine proposals to the most appropriate locations.

Typologies

2.4 The following typologies were used as the basis for the Dumfries and Galloway Wind Farm Landscape Capacity Study (DGWLCS) and for producing the spatial framework maps. They were selected to cover the sizes of turbines most likely to be available and the sizes/numbers of turbines likely to be encountered in planning applications.

- **'Large' typology: Turbines above 80m in height to blade tip.**
  These are more likely to comprise developments of over 10 turbines but the typology also includes single turbines or smaller groups at this height.
- **'Medium' typology: Turbines between 50m and 80m to blade tip.**
  These are more likely to comprise of single turbine developments or groups of up to 10 turbines. The typology could also include proposed extensions to older, existing wind farm developments (which tended to consist of turbines in this height range).
- **'Small-Medium' typology: Turbines between 20-50m to blade tip.**
  This typology includes single turbines or small groups of up to 5 turbines
- **'Small' typology: Turbines between 12-20m to blade tip**
  This typology includes single turbines or small groups of up to 5 turbines

2.5 Where wind energy proposals involve **turbine heights close to the cut-off between two typologies** (i.e. turbine heights within +/- 2metres of the cut-off height between the small and small/medium typologies and +/- 5 metres between the Small-medium and Medium typologies and between the Medium and Large typologies), the guidance provided for both typologies will be taken into account.

Applications for larger groups of turbines than those listed will be considered against the typology but also on their specific circumstances.

2.6 The two larger typologies of large and medium have been taken through to the spatial framework and **Areas of Greatest Potential have been identified for these typologies only.**

Part 3: Methodology and Rationale

Sieve Mapping

3.1 A sieve mapping process was used in order to build up a geographical understanding of sensitivities and constraints and identify opportunities for development in the form of Areas of Greatest Potential, as shown in Table 1 below.

3.2 The spatial framework is used to guide potential development of turbines in excess of 50m in height to appropriate locations (i.e. medium and large typology developments). The potential location of small and small/medium typology turbines is covered in the Supplementary Guidance: Part 1 Wind Energy Development – Development Management Considerations (the SG) and by referring to the DGWLCS.

Table 1 Methodology for Spatial Framework

Identify Areas Requiring Significant Protection
Approach set out in previous SPP: Identify areas designated for their national or international landscape or natural heritage value, areas designated as green belt and areas where the cumulative impact of existing and consented wind farms limits further development.
Approach used in Dumfries and Galloway : The following were identified as areas requiring significant protection; • Sites designated for their national or international natural heritage value o National Nature Reserves (NNRs) o National Scenic Areas (NSAs) o Ramsar Sites o Sites of Special Scientific Interest (SSSIs) o Special Areas of Conservation (SACs) o Special Protection Areas (SPAs) • There are no green belt designations within Dumfries and Galloway • The cumulative impact of existing and consented wind energy developments limit further development and/or where potential development would impact on a coherent pattern of development. ‘Strategic spaces’ have been identified based on clustering development within the ‘Areas of Greatest Potential’. These strategic spaces are referred to as ‘Cumulative Sensitivity Zones’ and are detailed in Part 4 (see also Map 3)

Identify Areas with Potential Constraints

Approach set out in previous SPP:

Areas where proposals will be considered on their individual merits against identified criteria, taking account of the following potential constraints:

- the historic environment,
- areas designated for their regional and local landscape or natural heritage value,
- tourism and recreation interests,
- likely impacts on communities, including long term and significant impact on amenity,
- impact on aviation and defence radar and seismological recording, and impact on broadcasting installations, particularly maintaining transmission links.

Approach used in Dumfries and Galloway :

Potential constraints: The following potential constraints were identified. These could be described as 'broad-scale' since they occur over a sufficiently wide area to be distinguishable on a regional-scale map:

- Archaeologically Sensitive Areas
- Key tourist routes and trails
- Inventory Gardens and Designed Landscapes
- Hadrian's Wall Heritage Site
- Local Nature Reserves
- Regional Scenic Areas
- RSPB/SNH high sensitivity bird areas

Other potential constraints: Other potential constraints exist but have not been mapped as part of the spatial framework because they may occur at a more local scale or are not capable of being mapped, such as impacts on communities. This does not lessen their importance and they will need to be identified, assessed and satisfactorily resolved to enable development to take place. Such constraints are laid out in the SG.

The spatial framework does not include current technical constraints such as those associated with the Eskdalemuir Testing Station and aviation interests. These aspects may be of a temporary or changing nature and may be mitigated through discussions with the relevant stakeholders; however aviation and MoD aspects have been included the SG.

Local scale constraints could occur throughout the region and may include, but would not be limited to, the following:

- Conservation Areas and Listed Buildings
- Non-inventory gardens and designed landscapes
- Scheduled monuments and archaeological assets assessed by the Council as likely to be of national importance

- Tourism and recreation sites

Opportunities for development: Whilst potential constraints have been mapped as broad-scale areas, there may be opportunities within these areas for development of medium or large typology turbines, subject to all relevant factors and guidance.

Identify Areas of Search

Approach set out in previous SPP:

The spatial framework should identify areas of search where appropriate proposals are likely to be supported subject to detailed consideration against identified criteria.

Having identified areas requiring significant protection and other potential constraints on wind farm development, planning authorities should identify areas of search where there are no significant constraints on development. Within these areas of search, sites may be constrained by other natural heritage interests, including habitats of high nature conservation value, project viability and grid capacity.

Approach used in Dumfries and Galloway :

'Areas of Greatest Potential' for development occur where there are no broad scale significant constraints to development. These are areas:

- which are not in areas requiring significant protection as defined above,
- which do not have broad-scale potential constraints as defined above,
- where the scale of development is consistent with the scale and character of the landscape.

Within Areas of Greatest Potential appropriate proposals are likely to be supported, subject to detailed consideration against identified factors outlined in the SG and other material factors, in the areas shown green on maps 1 and 2.

In formulating the Areas of Greatest Potential the capacity of the landscape to accept particular types of development as well as the potential constraints listed above have been taken into account.

Matching the scale of potential development to the scale and character of the landscape is a significant consideration as set out in the previous SPP paragraphs 185 and 187. Proposals for larger scales of development are less likely to be supported in areas where there is a higher sensitivity to such developments. Therefore, as per the previous SPP, these areas are not included in the Areas of Greatest Potential as this could lead to wasted effort through directing potential development to less appropriate areas. This would not meet the purpose of the spatial framework, and therefore landscape sensitivity has been included in the spatial framework (this represents a local variation to the approach set out in online

guidance). The evidence base for this strategic assessment is the DGWLCS (summarised in Part 5).

As a result areas have been identified where there is the greatest potential for development and where developments are less likely to be limited by landscape sensitivity. Thus providing guidance in directing turbine developments to appropriate locations, to maximise renewable energy potential and to minimise wasted effort and resources on inappropriately located proposals.

The full extent of landscape sensitivities (areas of higher and lower sensitivity to wind energy development as defined in the DGWLCS) for both large and medium typologies are shown in Maps 6 and 7.

3.3 The above methodology broadly followed the previous SPP and online guidance in place at that time. The guidance stated that variations on the approach to reflect local circumstances may also be compatible with Scottish Government policy outlined in the previous SPP.

3.4 The previous SPP stated that spatial frameworks should identify where appropriate proposals are likely to be supported subject to detailed considerations against identified criteria and where there are no significant constraints to development. Certain areas have been identified through the DGWLCS that have limited or provide for no further capacity for wind energy developments within certain typologies and in such areas proposals are unlikely to be supported. Therefore these areas are not included within the Areas of Greatest Potential.

3.5 The spatial framework is intended to guide large and medium typology turbine development to appropriate locations within the region, based on Scottish Government planning policy and guidance to maximise renewable energy potential and to minimise wasted effort and resources on inappropriately located proposals.

3.6 Not all potential constraints or factors to be considered in the assessment of wind energy developments are included in the spatial framework as they are not able to be mapped on a regional spatial scale and tend to relate more to specific locations.

Map 1 - Interim Spatial Framework Guidance for Large Typologies (over 80m to blade tip)

Key

- Areas of Greatest Potential
- Areas Requiring Significant Protection
- Operational and Consented * Wind Energy Developments

* Based on information available up to 31st October 2012

NB Turbine locations are indicative only

Clyde
Harehill
Windy Standard Extension
Windy Standard
Whiteside Hill
Harestanes
Wether Hill
Dalswinton
Torrs Hill
Blackcraig
Ewe Hill
Craig
Minsca
Arecleoch
Balmurrie Fell
Artfield Fell
Carscreugh
Glenchamber
North Rhins
Barlockhart
Trostrie
Robin Rigg

0 20.00
kilometers

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Map 2 - Interim Spatial Framework Guidance for Medium Typologies (50-80m to blade tip)

Key

- Areas of Greatest Potential
- Areas Requiring Significant Protection
- Operational and Consented * Wind Energy Developments

* Based on information available up to 31st October 2012

NB Turbine locations are indicative only

Clyde
Harehill
Windy Standard Extension
Windy Standard
Whiteside Hill
Harestanes
Wether Hill
Dalswinton
Torrs Hill
Blackcraig
Ewe Hill
Craig
Minsca
Arecleoch
Balmurrie Fell
Artfield Fell
Carscreugh
Glenchamber
North Rhins
Barlockhart
Trostrie
Robin Rigg

0 20.00
kilometers

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Part 4: Cumulative Sensitivity Zones

4.1 Potential cumulative effects can occur for all wind energy developments and the criteria used to assess these impacts are outlined in the SG. 'Cumulative Sensitivity Zones or CSZs' form part of the interim spatial framework and are a specific tool used to identify strategic spaces that are considered essential in achieving or maintaining a coherent pattern of development. This section sets out the rationale and basis for the CSZs and provides details of how the areas were drawn.

Background:

4.2 The principle of directing development to the most appropriate locations is embedded in SPP and is the basis of the spatial framework. The previous SPP states that 'the design and scale of any windfarm development should reflect the scale and character of the landscape' (this is also supported by siting and design guidance from SNH – see box below). If this is applied to areas other than flat 'plateau' landscapes, then 'clusters' of development will emerge within the areas where the local landscape has capacity to accommodate a particular level and scale of change. Conversely, other more sensitive landscape areas may not be suitable for development; or may be suitable for smaller scales of development.

4.3 This principle is supported by the latest version of the online guidance (31 Aug 2012) which suggests; '*It may be appropriate to plan for the clustering of windfarms within areas of search'* and that '*spaces between clusters may need to be identified as areas requiring significant protection in order to achieve a coherent pattern of development, avoid coalescence between them, and minimise the potential for adverse cumulative impacts'*. Specific areas have therefore been identified as requiring protection to support this principle; these are referred to as **'Cumulative Sensitivity Zones or CSZs'** throughout this document.

4.4 The principle of directing development to the most appropriate locations builds on the concepts of visual coherence and of landscape capacity. To achieve the first, coalescence should be avoided between areas of development and a distinction made between one pattern of development and another. To achieve the second, larger scale development is directed to larger scale landscapes with the capacity to accommodate them and smaller scale / more sensitive landscapes around these larger scale areas are protected to maintain the contrast of character. This section sets out the rationale and basis for this approach and provides details of the strategic areas and how they were drawn.

4.5 The online guidance also notes that '*the proliferation of inappropriately sited wind turbine developments could create the perception of a landscape dominated by windfarms to the detriment of its environmental quality and character'*. The most appropriate locations for clustering larger scale developments (Medium and Large typology turbines) within Dumfries and Galloway have been mapped as **'Areas of Greatest Potential' (AGP's)** and are based on the capacity of the landscape to accommodate such a level of change (- also taking account of existing developments and other environmental sensitivities, as set out in the spatial

framework). The DGWLCS was used as the evidence base for mapping these areas.

4.6 The capacity of the landscape to accommodate change depends on the character and nature of the area and of the development itself. The following guidance from SNH provides a useful basis for looking at landscape capacity:

Multiple Windfarms and Landscape Character:
The development of multiple windfarms within a particular area may create different types of cumulative effects, such as where:

- The windfarms are seen as separate isolated features within the landscape character type, too infrequent and of insufficient significance to be perceived as a characteristic of the area;
- The windfarms are seen as a key characteristic of the landscape, but not of sufficient dominance to be a defining characteristic of the area;
- The windfarms appear as a dominant characteristic of the area, seeming to define the character type as a 'windfarm landscape character type'.

From; *'Siting and Designing Windfarms in the Landscape'* (Section 5.5 P34, SNH Dec 2009)

Local landscape conditions:

4.7 Within Dumfries and Galloway, the scale and character of the region's more densely populated coastal lowland and valley landscapes are more suited to smaller typology turbines (less than 50m to blade tip), where such turbines are seen as isolated local features or can be accommodated as a characteristic of the landscape, but not of sufficient dominance to become a defining characteristic.

4.8 Many of the region's larger scale upland areas which are remote from sensitive settled landscapes and are not designated landscapes, are more likely to have the capacity to accommodate larger scale development (medium - 50-80m and large typologies - over 80m) where windfarms could become a key characteristic of the landscape. In some more extensively afforested uplands there may be capacity to accommodate multiple windfarms such that they become a defining characteristic of the landscape and be perceived as 'windfarm landscapes'. It is not anticipated that all AGPs have this capacity, or not in relation to their entire area.

4.9 Between the lowlands and uplands, transitional landscapes may be attractive to both smaller and larger scale wind energy developments. The following potential issues and sensitivities to development may arise:

- Intervisibility with larger windfarm development in adjacent upland areas;
- Contrasts between the scale and character of landform and features, which are characteristics of transitional landscapes and are often quite subtle within this region;
- The distinct experience and appreciation of the contrasting lowlands and uplands either side of transitional landscapes.

4.10 Applying the principle of clustering larger scale development within non designated and less sensitive upland areas in order to

create a coherent and appropriate pattern of development depends on containing the spread of development and setting it back from sensitive settled and transitional landscapes.

Criteria for mapping CSZs:

4.11 Cumulative Sensitivity Zones identify strategic spaces that are considered essential in achieving or maintaining a coherent pattern of development, based on the following criteria:

1. Avoiding coalescence between existing/consented developments and/or AGPs
2. Defining and containing these areas and limiting their extent
3. Protecting intervening and/or outlying sensitive landscapes including transitional landscapes and settled valleys from the cumulative effects of inappropriately sited and designed development
4. Avoiding potential visual discordance from differently sited and designed wind energy developments seen in close association
5. Maintaining the visual distinction between areas where windfarms may be a key characteristic, or on occasion a defining characteristic / 'windfarm landscapes' and areas outwith them, where windfarms occur as isolated features, or not at all.

4.12 All parts of the CSZs were assessed as having a higher sensitivity to larger scale development within the DGWLCS. However, there may be scope for isolated windfarm developments within the CSZs where the DGWLCS has identified capacity and subject to specific siting and design issues, provided visual separation can be achieved and the development is consistent with the criteria listed above. Development of smaller typologies within the CSZs may also be limited by potential cumulative effects and will be assessed against the same objectives.

4.13 developments within the region, the areas have been reviewed and amended. Potential cumulative effects will continue to evolve as new developments come forward so the CSZ boundaries will need to be reviewed on a regular basis

4.14 Three broad areas have been identified as CSZs; these are illustrated in Map 3. CSZs may be extended or new CSZs defined in response to future development pressures.

Mapping CSZs:

4.15 According to the DGWLCS, the following landscape character types are the areas with the most capacity for larger scale wind energy development within the region;

- LCT17a; Plateau Moorland with Forest
- LCT18a; Foothills with Forest – Castle Oer, Eskdale and Tinnisburn units
- LCT18a; Foothills with Forest – Stroan unit (Medium typology only)
- LCT19a Southern Uplands with Forest

This is used in combination with the other environmental constraints set out in the spatial framework to define the AGP based in the Wigtownshire moorlands, the eastern Glenkens and Eskdalemuir areas (see maps 1 and 2)

4.16 Some of the regions more open upland landscapes may be suitable for isolated developments but would be highly sensitive to potential cumulative effects from multiple windfarm

developments. This includes LCT17; Plateau Moorland (with the exception of the Cairnscarrow area which is partially within a CSZ – see table 2 below) and the Annandale unit of LCT18; Foothills (see table 4). These landscape units are not included in the AGPs or the CSZs and potential cumulative issues in relation to development within these areas will be assessed through the development management process.

4.17 The three CSZs tend to wrap around AGPs, forming 'crescent' shapes. For ease of reference, descriptions for each CSZ have been divided into three or four smaller sections in the following tables. These sections are ordered anticlockwise starting in the north-western corner.

<table>
<tr><th colspan="2">Table 2: Wigtownshire Moorlands Cumulative Sensitivity Zone</th></tr>
<tr><td colspan="2">Existing/consented large typology developments within the vicinity;</td></tr>
<tr><td colspan="2">• Arechleoch
• Artfield Fell
• Balmurrie Fell
• Glenchamber
• Carscreugh
• North Rhins
• Barlockhart</td></tr>
<tr><td colspan="2">Valid applications and/or awaiting appeal;</td></tr>
<tr><td colspan="2">• Kilgallioch
• Hill of Ochiltree</td></tr>
<tr><td colspan="2">Area 1: The moorland and western slopes of LCT17 including the summits of Cairnscarrow, Braid Fell and Balker Moor as far north as the afforested Brocklock Fell</td></tr>
<tr><td>Criteria:</td><td>Rationale:</td></tr>
<tr><td>3

3

5</td><td>• The Balker Moor unit of LCT 16 is a transitional landscape and is highly sensitive to larger typology turbine development. The plateau edge area of LCT17 including the summits of Balker Moor, Braid Fell and Cairnscarrow is also sensitive and both areas are visible from and/or form the skyline from the settled Stranraer basin and ferry routes to Ireland.
• Intervisibility with the settled and farmed landscape of The Rhins, and the existing North Rhins wind farm could lead to cumulative impacts when viewed in sequence with potential developments within this part of the CSZ.
• Maintains visual distinction between landscapes to the east and north where windfarms are becoming a defining characteristic</td></tr>
<tr><td colspan="2">Area 2: The Balker Moor unit of LCT16; Upland Fringe and the Water of Luce valley (LCT3).</td></tr>
<tr><td>Criteria:</td><td>Rationale:</td></tr>
<tr><td>2, 3</td><td>• Development of larger typologies would detract from this transitional landscape and the contrast between the adjacent</td></tr>
</table>

2, 3	upland open moorlands and more complex settled lowland areas including the Stranraer coastal flats, the Water of Luce and the area around Glenluce village. • The consent of Carscreugh further reduces this area's capacity for windfarm development in relation to the strategic cumulative issues. • The sensitive settled and farmed narrow Water of Luce valley helps define and contrasts with the upland plateau landscapes. Development within the vicinity of this unit would detract from contrasts in scale and character
Area 3: Part of LCT 12 Drumlin Pasture in Moss and Moorland and the margins of LCT17a Plateau Moorland with Forest which form a 'corridor' adjacent to the A75, including Gleniron, Lairg and Bught Fells, Kilhern Moss, Glen Chamber, Dergoals Moss and Blairderry Moss west of Tarf Water.	
Criteria:	**Rationale:**
3 1 3, 5 2	• The transitional landscapes around the A75 corridor are highly sensitive to the larger typologies. • Existing/consented developments including Carscreugh, Glenchamber, Artfield Fell and Balmurrie Fell contribute to potential cumulative effects in this area. Further development would lead to coalescence between existing/consented developments when viewed sequentially from this important through route. • Spread of larger scale development into this area, would impinge on sensitive lowland and transitional landscapes, increasing the perception of a landscape dominated by windfarms and detracting from contrasts between adjacent upland open moorlands and more complex settled lowland areas. • This area helps define a logical edge to the Wigtownshire Moors AGP
Area 4: The section of LCT 11 including mosses, afforested mosses and agricultural land, centred on Knock Fell.	
Criteria:	**Rationale:**
3 3 3	• The setting of Knock Fell as a landmark feature, rising less than 100m from the low lying surroundings, would be sensitive to larger typologies and windfarms with a large lateral spread. • The moss and forest lowland area south of the A75 and to the north and east of Knock Fell is relatively unsettled but is sensitive to larger scale development. There is no capacity to accommodate multiple larger typologies within this landscape unit. • The adjacent Mochrum Plateau with Lochs LCT (also an RSA) is highly sensitive to larger scale development and has high intervisibility.
Area 5: The section of LCT 12 Drumlin Pasture in Moss and Moorland to the north of the A75 area including Barskeoch Fell, Culvennan Fell and Barfad Fell to the north.	

Criteria:	Rationale:
2, 3 3, 5 4	• The ridge of uplands (Barskeoch, Fell End, Culvennan, and Barfad Fells) are important in containing and partially screening the Wigtownshire Moors AGP from the sensitive areas to the south east, including Newton Stewart, and the A75 corridor. • The lowland drumlin landscapes around the A75 are complex and fine-grained and are highly visible from this route. Potential larger scale developments within this area would be highly visible and out of scale with this adjacent landscape. • The area to the south of the A75 already contains a number of smaller typology turbines or consented developments. There are potentially significant cumulative visual impacts given the potential intervisibility of differing scales of development within this area if multiple, or isolated larger scale developments were included.
Area 6: Part of LCT 12 Drumlin Pasture in Moss and Moorland including the settled, farmed and estate lands area east of the Tarf Water and around Kirkcowan, Spittal, and Newton Stuart; and the rougher moorlands of Barwhirran and Barr Moor.	
Criteria:	**Rationale:**
3,5 3 2, 3 4	• The lowland drumlin landscapes around the A75 are complex and fine-grained and are highly visible from this route. Potential larger scale developments within this area would be highly visible and out of scale with the landscape. • There are a number of Non-inventory Designed Landscapes in this area, including Craighlaw, Shennanton Hall, Merton Hall, and Mochrum Park, as well as other improvement landscapes with notable policies (Benfield, Barnean, Cullach, Drumturlie, Skaith, Challoch). Larger scale development within this area would be out of scale with the landscape, and compromise the aesthetic qualities of the designed landscapes, their setting as landscape features, and outlook. • The rougher moorlands of Barwhirran, Barr Hill and Barr Moor are important in containing and partially screening the Wigtownshire Moorlands AGP from the sensitive areas to the south east, including the setting of the Head of Wigtown Bay, views from Wigtown, Creetown and the settled farmlands of The Machars. • The area to the south of the A75 already contains a number of smaller typology turbines or consented developments. There are potentially significant cumulative visual impacts given the potential intervisibility of differing scales of development within this area if multiple, or isolated larger scale developments were included
Area 7: Part of LCT17a between the River Bladnoch and River Cree from the regional border in the north to Newton Stewart, including the open moorland and lochs around Loch Ochiltree plus the narrow wooded valley of the river Cree.	

Criteria:	Rationale:
1 3, 5	• This area lies between two AGPs and is included in order to prevent coalescence between the two by maintaining a clear gap between. • Larger typology turbines would not fit with the scale and character of this part of the landscape unit and multiple large developments would dominate this extensive but predominantly open and more complex landscape. The setting of Loch Ochiltree and the River Cree could easily be dominated by larger turbines.

Table 3: Glenkens and Nithsdale Cumulative Sensitivity Zone	
Existing/consented developments;	
• Black Craig • Dalswinton • Harehill • Windy Standard • Windy Standard Extension • Wether Hill • Whiteside Hill	
Valid applications and/or awaiting appeal;	
• Auchencairn • Loch Hill • Harehill Extension • Knockman Hill • Margree • Southmains • Ulzieside	
Landscape units with some capacity for Med/Large typologies;	
• LCT18a; Foothills with Forest – Stroan unit is within the area of greatest potential for Medium typology turbines (and outwith the CSZ).	
Area 1: LCT9; Upper Dales – Upper Glenkens unit and LCT8; Flooded Valley	
Criteria:	**Rationale:**
3 5	• The Glenkens valley is highly sensitive to larger wind energy development and lacks the capacity to accommodate development at this scale without significant adverse impacts occurring on key landscape and visual sensitivities. • The setting of and views from New Galloway, St John's Town of Dalry, and several designed landscape in the area, would be sensitive to windfarm development.
Area 2: LCT19; Southern Uplands – Carsphairn unit	
Criteria:	**Rationale:**
1	• This unit provides clear separation between two AGPs, plus the

3 5	existing Windy Standard windfarm. • The setting of Cairnsmore of Carsphairn, associated hills, as a landmark feature in the wider Glen Kens and Ken Valley surroundings, as well as Knockgray designed landscape, would be sensitive to larger typologies, and windfarms with a large lateral spread. The panoramic views from the summit would also be sensitive. • The openness of this landscape unit provides a strong contrast to the adjacent afforested units which have capacity to accommodate larger typology turbines. High landscape and visual sensitivities limit the scope for this scale of development.
Area 3: Northern part of the Deeside unit of LCT13; Drumlin Pastures, LCT16; Upland Fringe, and LCT 4; Narrow Wooded Valley	
Criteria:	**Rationale:**
3, 5 4, 5	• The small scale and distinctive landforms of the drumlin pastures are highly sensitive to larger typology turbine development. The strong contrast between this settled landscape and adjacent upland areas increase the importance of this part of the unit as a strategic space where development at this scale would detract from a coherent pattern of development. • The southern limit of the CSZ cuts across an open valley and is set at approximately 5km from the edge of the AGP but it is recognised that potential development could create visual impacts beyond this boundary, due to the open undulating nature of landform in this area. Specific cumulative issues from development within this area would need to be assessed on a case by case basis. • The Upland Fringe unit is a sensitive transitional landscape and forms an important transition between areas with capacity for medium typology turbines and the settled lowlands with capacity for smaller typology turbines (the AGP for large typology turbines is set well back from this area).
Area 4: LCT18; Foothills – Dalmaclellan unit,	
Criteria:	**Rationale:**
5 1	• There is some limited capacity for isolated medium typology turbine development within this area but the landscape character is sensitive to more extensive development. • Potential cumulative effects from multiple developments in association with the consented Blackcraig Windfarm would also impact on the area, in particular the setting of Loch Urr and surrounding settled and farmed valleys.
Area 5: LCT16; Upland Fringe – Cairn Fringe unit, LCT5; Intimate Pastoral Valley – Cairn and Old Water unit.	
Criteria:	**Rationale:**
3, 5	• The valleys around Moniaive are complex and fine-grained

3	settled landscapes. Development of any larger scale turbines within these areas – or within the transitional landscapes which define, contrast with and contain the valleys would have a significant detrimental impact on landscape character. Multiple developments within the viewshed of these valleys would significantly alter the appearance and character of the area, creating significant detrimental visual impacts. • The setting of and views from Moniave and numerous designed landscapes (Maxwelton IDL, and Drumpark, Newtonairds, Speddock, Stroquhan, Dalgonar NIDLS) would be sensitive to windfarm development.
Area 6: LCT18; Foothills – Tynron units, LCT10; Upland Glens – Castlefairn, Dalwhat and, in part the Scar units, LCT 19a – part of Ken unit (around Cairnhead and Benbrack)	
Criteria:	**Rationale:**
3, 5 3	• The valleys around Moniaive, Tynron, Penpont and Dunscore are complex and fine-grained settled landscapes. Development of any larger scale turbines within these areas – or within the transitional landscapes which define, contrast with and contain the valleys would have a significant detrimental impact on landscape character. Multiple developments within the viewshed of these valleys would significantly alter the appearance and character of the area, creating significant detrimental visual impacts. • The setting of and views from Moniaive, Tynron, Penpont, and Thornhill and numerous designed landscapes (Drumlanrig Inventory Designed Landscape, and Crawfordton, Capenoch, Eccles, Dabton and Drum Non-inventory Designed Landscapes would be sensitive to windfarm development.
Area 7: LCT19; Southern Uplands - Nithsdale unit, LCT10; Upland Glens – Scar unit in part	
Criteria:	**Rationale:**
3, 5 3, 5 1 3	• This Southern Uplands unit is broad scale and open and provides a backdrop to the settled Upper Nith valley including Drumlanrig Castle and Designed Landscape. Long hill slopes and smooth profiles further increase sensitivity to development. • The Scar Valley dissects the upland area and is a relatively unspoilt secluded and dramatic glen, with isolated farms set in sculptural and in places craggy hills. Development of any larger scale turbines within this area would have a significant detrimental impact on landscape character. Multiple developments within the viewshed of this valley would significantly alter the appearance and character of the area, creating significant detrimental visual impacts. • Potential cumulative effects associated with any new development and the consented Whiteside Hill windfarm and existing Harehill windfarm to the north would be significant and the DGWLCS indicates that the capacity for larger scale development within this unit is nearly reached.

	• The panoramic views from the summits and ridgelines of the Lowther Hills (Thornhill Uplands RSA) to the east of the Upper Nith Valley, and in particular Lowther Hill, would be sensitive to further cumulative impacts from large windfarm typologies in this area and seen in combination, successionally with Clyde Windfarm.
Area 8: LCT9; Upper Dale – Nithsdale unit	
Criteria:	**Rationale:**
1, 5 3 1 1	• Potential intervisibility within and from the broad sections of the upper Nithsdale valley increases sensitivity to potential cumulative effects from larger developments and in combination with existing developments at Harehill and Daleswinton which are visible from parts of this unit. • More complex outcrop hills, pinch points and landscape features within the landscape unit are also sensitive to larger scale development. • The Nith valley also provides an element of separation between the AGP and the operational Dalswinton wind energy development to the south. • The panoramic views from the summits and ridgelines of the Lowther Hills (Thornhill Uplands RSA) to the east of the Upper Nith Valley would be sensitive to further cumulative impacts from large windfarm typologies in this area and seen in combination, successionally with Clyde Windfarm. • Potential cumulative impacts may also arise in combination with ongoing extensive open cast coal mining works to the north including Glenmuckloch and Rigg open cast schemes.
LCT 18a – part of the Area of Greatest Potential for Medium typology:	
Rationale; • Not part of the CSZ; however, it has a strategic role since the scale of development is critical to maintaining a coherent pattern of development, based on landscape sensitivity and capacity to accommodate change without windfarms becoming a determining characteristic. Development within this area will need to be limited to less than 80m in height. • The consent of Blackcraig further reduces this area's capacity for windfarm development in relation to the strategic cumulative issues. The proximity of the scheme to the east Glenkens AGP will result in cumulative issues and is likely to reduce scope for development there.	

Table 4: Annandale and Eskdale Cumulative Sensitivity Zone
Existing/consented developments;
• Dalswinton

<table>
<tr><td colspan="2">

- Harestanes
- Clyde
- Minsca
- Ewe Hill 6
- Craig

</td></tr>
<tr><td colspan="2">Valid applications and/or awaiting appeal;</td></tr>
<tr><td colspan="2">

- Earlshaugh
- Minnygap
- Newfield
- Ewe Hill
- Solwaybank
- Beck Burn

</td></tr>
<tr><td colspan="2">Landscape units with some capacity for Med/Large typologies;</td></tr>
<tr><td colspan="2">

- LCT18a Foothills – Annandale unit is not in an area of greatest potential or the CSZ.

</td></tr>
<tr><td colspan="2">Area 1: LCT10; Upland Glens – Evan and Moffat units plus LCT19; Southern Uplands – North Moffat and East Moffat units</td></tr>
<tr><td>Criteria:</td><td>Rationale:</td></tr>
<tr><td>1

3

3, 5

1, 5</td><td>

- North of this area, the extensive operational Clyde windfarm creates a significant cluster of development and is clearly visible from the M74. Introducing windfarm development into this area would extend the corridor effect.
- The setting of the upland glens and the southern uplands including the Devil’s Beeftub area, Hart Fell, Moffat Glen and Moffat Water are particularly sensitive to larger development and the potential for sequential views of existing/consented wind energy developments is high.
- The panoramic views from the summits and ridges would also be sensitive to successional and combined effects. The area includes waymarked tourist routes, the SUW and the Annandale Way, and key gateways to the region.
- This part of the Southern Uplands is included within the CSZ to maintain a clear distinction between potential or existing ‘windfarm’ landscapes and the landscape outside.

</td></tr>
<tr><td colspan="2">Area 2: LCT6; Lower Dales and LCT7; Middle Dales – Lower/Mid Nithsdale units plus LCT16; Upland Fringe – part of the Annandale Fringe unit north of Dryfe valley and LCT5; Intimate Pastoral Valley – Dryfe unit.</td></tr>
<tr><td>Criteria:</td><td>Rationale:</td></tr>
<tr><td>1, 5

3</td><td>

- The Annan valley is an open broad valley with long views and a predominantly settled character. The consented Harestanes development (71 turbines) lies to the west and on the opposite side east of Beattock, lies an AGP. This part of the CSZ forms a strategic space between these potential or existing clusters and is included to prevent coalescence between the areas.
- The M74 and west coast main railwayline pass through the Annan valley and are sensitive to sequential cumulative visual impacts from potential larger developments located within or on

</td></tr>
</table>

3 3, 5	the periphery of the valley in association with existing/ consented developments at Clyde and Harestanes. • The narrow upland fringe unit to the east of the valley represents a transitional landscape. It is therefore highly sensitive to larger scale development which would need to be set back from the edge of the foothills into the Southern Uplands (the Annandale unit of the LCT18; Foothills has some capacity for development, depending on careful siting and design in relation to ridgelines and local landform). • The Dryfe valley is an intimate fine-grained and settled valley; as such it is highly sensitive to larger scales of development
Area 3: LCT16; part of the Upland Fringe –Annandale Fringe unit south of Dryfe valley and LCT15; Annandale Flow Plateau.	
Criteria:	**Rationale:**
3 3, 5 1	• The upland fringe landscape forms a transition between the foothills and the coastal plateau landscapes. It is characterised by long views of the uplands interspersed by distinctive minor summits including Burnswark and is sensitive to larger scale development (the adjacent Foothills LCT18 also has very limited capacity for isolated development). • The flow plateau to the east of Gretna is an open gently undulating landscape with broad vistas toward the foothills and southern uplands beyond. Multiple larger scale developments would potentially dominate this open settled and lowland landscape. The M74 and west coast mainline run through this area (see above). • The operational wind energy development at Minsca is visible across parts of these units, contributing to potential cumulative effects.
Area 4: Eskdale units of LCT4; Narrow Wooded Valley, LCT5; Pastoral Valley and LCT10; Upland Glen – Ewes unit	
Criteria:	**Rationale:**
1, 3, 5	• The narrow settled valleys within the Esk catchment have no scope for larger scales of development without incurring significant impacts across key landscape and visual sensitivities. Encouraging multiple development within these areas would result in a landscape dominated by windfarms and would detract from the pattern of development based on setting larger scale developments back within the interior of the much larger scale afforested upland landscapes within the AGP.

Map 3 - Cumulative Sensitivity Zones

Key

Operational and Consented Wind Energy Developments *

Cumulative Sensitivity Zones

* Based on information available up to 31st December 2012

NB Turbine locations are indicative only

Glenkens and Nithsdale Cumulative Sensitivity Zone

Clyde

Harehill

Windy Standard Extension

Windy Standard

Whiteside Hill

Harestanes

Wether Hill

Torrs Hill

Dalswinton

Blackcraig

Ewe Hill

Craig

Minsca

Arecleoch

Balmurrie Fell

Artfield Fell

Carscreugh

Glenchamber

North Rhins

Barlockhart

Annandale and Eskdale Cumulative Sensitivity Zone

Wigtownshire Moorlands Cumulative Sensitivity Zone

Trostrie

Robin Rigg

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kilometers

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Map 4 - Areas of Significant Protection and Cumulative Sensitivity Zones

Key

- Areas of Significant Protection
- Cumulative Sensitivity Zones

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kilometers

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Part 5: Landscape Character Sensitivity summary tables

The table below provides a summary of the landscape character sensitivities for each typology within each landscape type taken from the DGWLCS where:

H= High M=Medium L=Low

Landscape type	***Landscape Unit***	***Development typology***	***Sensitivity assessment***		
			landscape	visual	values
1 Peninsula	Rhins	large	H	H	HM
		medium	HM	HM	M
		small-med	M	M	M
		small	L	ML	L
	Machars	large	H	H	M
		medium	HM	HM	ML
		small-med	M	HM	ML
		small	L	ML	L
	Dundrennan	large	H	H	HM
		medium	HM	HM	M
		small-med	M	M	ML
		small	L	L	ML
1a Peninsula with Gorsey Knolls	All units	large	H	H	H to HM
		medium	H	H	H to HM
		small-med	HM	HM	H to HM
		small	ML	ML	L
2 Coastal Flats	Wigtown, Cree/Fleet, Nith, Inner Solway	large	H	H	H to HM
		medium	HM	H	H to HM
		small-med	HM	H	H to HM
		small	ML	ML	HM to M
	Stranraer Basin	large	HM	H	ML
		medium	M	H	ML
		small-med	M	HM	ML
		small	L	ML	L
3,4 Valleys	All units	large	H	H	H to L
		med	H	H	H to L
		small-med	HM	HM	H to L
		small	L	L	L
5 Intimate Pastoral Valley	Cairn, Old Water, Dryfe, Pastoral Eskdale	large	H	H	HM to L
		medium	H	H	HM to L
		small-med	HM	HM	HM to L
		small	L	L	L
6,7 Dales	All units	large	H	H	HM to L
		medium	H	H	HM to L
		small-med	M	H	HM to L
		small	L	L	M to L
7a Dales with Hills	One unit only - Annandale	large	H	H	L
		medium	H	H	L
		small-med	H	HM	L
		small	M	M	L
8 Flooded valley	Ken valley	large	H	H	HM
		medium	H	H	HM
		small-med	HM	HM	HM
		small	ML	ML	ML
9 Upper Dales	Upper Glenkens, Upper Nithsdale	large	H	H	HM to L
		medium	HM	H	HM to L
		small-med	M	H	HM to L
		small	L	L	M to L

10 Upland Glens	Castlefairn, Dalwhat, Shinnel, Scar, Mennock, Dalveen, Upper Annandale, Moffat, Ewes	large	H	H	HM
		medium	H	H	HM
		small-med	HM	H	HM
		small	L	ML	ML
11 Moss and Forest lowland	Machars	large	HM	HM	HM to L
		medium	M	HM	HM to L
		small-med	-	-	-
		small	-	-	-
12 Drumlin Pasture in Moss and Moor Lowland	Machars	large	H	HM	L
		medium	HM	HM	L
		small-med	M	M	L
		small	ML	L	L
13 Drumlin Pastures	Machers, Deeside, Milton	large	H	H	HM to L
		medium	H	HM	HM to L
		small-med	HM	HM	HM to L
		small	ML	ML	M to L
14,15 Coastal/Flow Plateau	All units	large	H	H	L
		medium	HM	H	L
		small-med	M	HM	L
		small	L	ML	L
16 Upland Fringe	Torthorwald, Terregles, Dunscore, Ward Law	large	H	H	H to HM
		medium	H	H	H to HM
		small-med	HM	HM	H to HM
		small	ML	M	M
	Ae, Annandale, Liddesdale, Cairn, Cairnharrow	large	H	H	H to L
		medium	HM	H	H to L
		small-med	M	HM	H to L
		small	ML	M	M to L
17 Plateau moorland	Balker Moor	large	M	M	L
		medium	ML	M	L
		small-med	ML	ML	L
		small	L	L	L
17a Plateau with Forestry	Glentrool	large	ML	M	M to L
		medium	ML	M	M to L
		small-med	-	-	-
		small	-	-	-
17b Plateau with Lochs	Mochrum Lochs	large	H	HM	HM
		medium	H	HM	HM
		small-med	-	-	-
		small	-	-	-
18 Foothills	Cairnharrow	large	H	H	H to HM
		medium	HM	H	H to HM
		small-med	-	-	-
		small	-	-	-
	Fleet	large	H	H	H to HM
		medium	H	H	H to HM
		small-med	-	-	-
		small	-	-	-
	Dalmacallan	large	HM	H	HM to L
		medium	M	HM	HM to L
		small-med	-	-	-
		small	-	-	-
	Keir, Tynron	large	H	H	HM
		medium	H	H	HM
		small-med	-	-	-
		small	-	-	-
	Nithsdale	large	H	H	HM

		medium	H	H	HM
		small-med	H	HM	HM
		small	ML	M	M
	Beattock	large	HM	H	HM
		medium	M	HM	HM
		small-med	-	-	-
		small	-	-	-
	Annandale	large	HM	H	L
		medium	HM	H	L
		small-med	M	HM	L
		small	L	L	L
18a Foothills with Forest	Cairnsmore	large	HM	HM	HM
		medium	HM	HM	HM
		small-med	-	-	-
		small	-	-	-
	Cullendoch	large	M	HM	H to L
		medium	ML	HM	H to L
		small-med	-	-	-
		small	-	-	-
	Laurieston	large	HM	H	HM to L
		medium	M	HM	M to L
		small-med	-	-	-
		small	-	-	-
	Rhinns of Kells	large	M	H	HM
		medium	ML	H	HM
		small-med	-	-	-
		small	-	-	-
	Stroan	large	M	HM	L
		medium	ML	M	L
		small-med	-	-	-
		small	-	-	-
	Ae	large	M	M	L
		medium	ML	M	L
		small-med	-	-	-
		small	-	-	-
	Eskdale, Oer, Tinnisburn	large	ML	M	HM to L
		medium	ML	ML	HM to L
		small-med	-	-	-
		small	-	-	-
19 Southern Uplands	Nithsdale, NW Lowther	large	M	HM	HM to L
		medium	ML	HM	HM to L
		small-med	-	-	-
		small	-	-	-
	Carsphairy, Lowther, North Moffat, East Moffat, North Langholm, West Langholm, Tarras	large	H	H	HM
		medium	H	H	HM
		small-med	-	-	-
		small	-	-	-
19a Southern Uplands with Forests	Carsphairn, Ken, Eskdalemuir, West Langholm	large	L	ML	L
		medium	L	ML	L
		small-med	-	-	-
		small	-	-	-

20 Coastal Granite Uplands	Cairnsmore	large	H	H	HM
		medium	H	H	HM
		small-med	-	-	-
		small	-	-	-
	Bengairn	large	H	H	H/ L
		medium	HM	H	H/ L
		small-med	HM	HM	H/ L
		small	ML	M	M/L
	Dalbeattie	large	HM	H	H/L
		medium	HM	H	H/L
		small-med	M	HM	H/L
		small	L	M	M/L
21 Rugged Granite Uplands	Merrick, Rhinns of Kells	large	H	H	H
		medium	H	H	H
		small-med	-	-	-
		small	-	-	-
21a Rugged Granite Uplands with Forestry	Merrick, Glentrool	large	HM	H	H
		medium	HM	H	H
		small-med	-	-	-
		small	-	-	-
	Cairn Edward	large	M	HM	HM
		medium	M	M	M
		small-med	-	-	-
		small	-	-	-

Map 5 - Landscape Character Areas as amended by D&G Windfarm Landscape Capacity Study

1 - Peninsula
1a - Peninsula with gorsey knolls
2 - Coastal Flats
3 - Shallow flat bottomed valley
4 - Narrow wooded river valley
5 - Intimate pastoral valley
6 - Lower Dale
7 - Middle Dale
7a - Middle Dale with Hills
8 - Flooded Valley
9 - Upper Dale
10 - Upland Glens
11 - Moss and Forest Lowland
12 - Drumlin Pasture in Moss and Moor Lowland
13 - Drumlin Pastures
14 - Coastal Plateau
15 - Flow Plateau
16 - Upland Fringe
17 - Plateau Moorland
17a - Plateau Moorland with Forest
17b - Plateau Moorland with Loch
18 - Foothills
18a - Foothills with Forest
19 - Southern Uplands
19a - Southern Uplands with Forest
20 - Coastal Granite Uplands
21 - Rugged Granite Uplands
21a - Rugged Granite Uplands with Forest

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kilometers

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Map 6 - Areas where the potential for Large Typology turbines is limited by Landscape Sensitivity

Key

- Higher Sensitivity Landscape Character Areas
- Lower Sensitivity Landscape Character Areas

Scale 1:500,000

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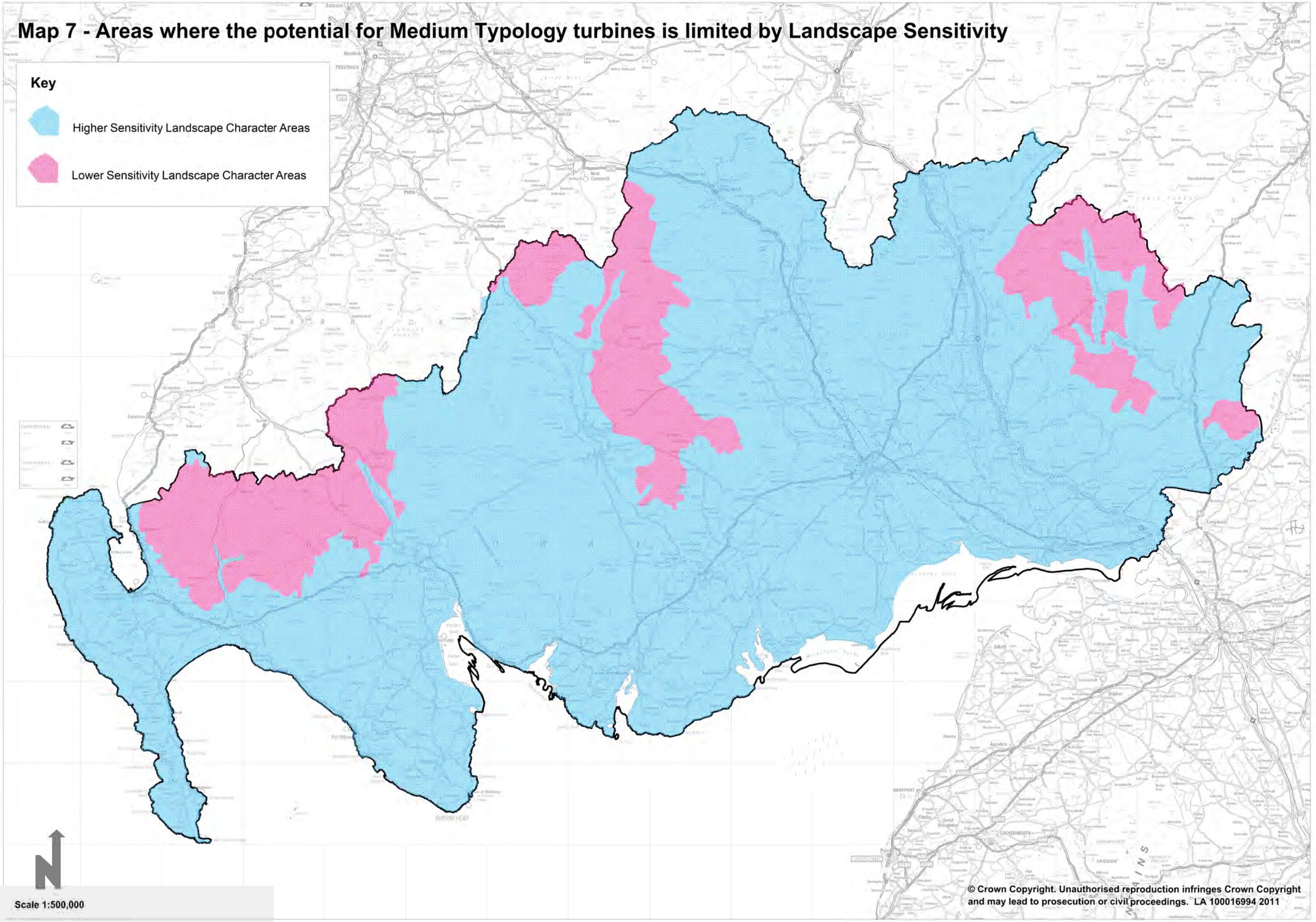
Map 7 - Areas where the potential for Medium Typology turbines is limited by Landscape Sensitivity



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