

impacts. Government guidance provided in PPG 22 requires that when considering the visual impact of wind turbines

"their particular and unusual characteristics [should be borne] clearly in mind"

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7.5.2 In many cases the principal visual impact is **Visual Intrusion**, that is the degree to which the development would intrude upon the human field of view of people living, working or enjoying recreational activities within the area.

7.5.3 Other secondary visual effects may also occur, including **glinting**, the effect of light reflected off the turbine blades, which may occur particularly when the blades are wet and rotating in strong sunshine. The likely incidence of glinting is difficult to predict, but experience suggests that it occurs only infrequently and diminishes with distance; it is therefore unlikely to be an impact of significance.

7.5.4 **Shadow flicker** is a further potential visual impact which may potentially occur under certain combinations of geographical position and time of day, when the sun may pass behind the moving rotor blade and cast a shadow over neighbouring properties. Due to the location of the turbines in relation to Lowca village, and to scattered properties including Park House Farm, shadow flicker is not expected to occur.

7.5.5 Potential visual impacts, and in particular visual intrusion, may be predicted by reference to:

- the **potential visibility** of the windcluster, assessed using
 - computer-generated **Zone of Visual Influence** analyses (ZVI) at the broad scale, and at a more detailed scale in the vicinity of Lowca
 - computer-generated photomontages which simulate the appearance of the windcluster in landscape when viewed from a number of selected viewpoints
- the **sensitivity** of different types of viewer/viewpoint affected (and numbers affected where possible)
- the **distance of view** and degree or **magnitude of visual intrusion** that would potentially occur
- the **significance** of resulting impacts upon the character and quality of views

These aspects are considered in more detail below.

Prediction of potential visibility - ZVIs

7.5.6 The ZVIs present a 'worst case' analysis of visual influence, for they are based topographic features only. Interpretation of the ZVIs therefore requires full consideration of the effects of surface features, such as intervening woodland or buildings, which may interrupt or filter views. Two ZVIs have been prepared which together provide *general guidance only* to the potential turbine visibility over a broad area of West Cumbria. They have been prepared at 1:50 000 scale using standard OS 'Panorama' topographic data. They are reproduced at 1:100 000 scale:

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- **Figure 7** (scale 1:100, 000) indicates the numbers of turbines (or parts of turbines) potentially visible (1 or 2, 3 or 4, 5 or 6, or the total development of 7 turbines),
- **Figure 8** (scale 1:100, 000) presents an analysis of the proportion of turbine structures potentially visible of any one turbine (blade tip only visible, half blade only, full blade only, full blade plus upper half of turbine tower, full blade plus full tower visible)

7.5.7 In addition, further ZVIs have been prepared to provide guidance concerning the potential visibility of the turbines within local views. They have been prepared at 1:10 000 scale using topographic data at 5m resolution and presented as **Figure 9**.

- **Figure 9** (scale 1:20, 000) presents two limited range ZVIs which provide a more detailed assessment of the potential visibility of the turbines in views from properties in Lowca.

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The prediction of potential visibility - Photomontages

7.5.8 Officers from Copeland Borough Council guided the selection of the following viewpoints from which important views of the windcluster would be available. The locations of these viewpoints are illustrated on **Figure 12**. Simulated views, or photomontages from these viewpoints, as they would appear following the construction of the Lowca windcluster, have been prepared using computer generation and graphic techniques, and are reproduced in **Volume 3** of this Environmental Statement:

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- **Viewpoint 1**, on the northern edge of Lowca, looking north-west (approx. 800 m from the closest turbine) The photomontage of Viewpoint 1 illustrates the view from the C4001 road adjacent to Micklam House, and is considered to be representative of views from properties located on the northern edge of Lowca. The C4001 is a minor road which carries a limited volume of local traffic. In this view the intervening landform of Lowca ridge prevents views of the lower parts of the turbines, so that the blades or blade tips only of 3 turbines would be seen, together with the blades and upper towers of the other 4 turbines, as features against the sky.
- **Viewpoint 2** is located on the Cumbria Coastal Way footpath on the southern edge of Salterbeck. The photomontage of Viewpoint 2 illustrates a typical view southward, (approx 2.05 km from the closest turbine), down the coast from Salterbeck. The turbines, aligned parallel to the coast, would appear in the middle ground as features on the clifftop horizon. From views up and down the coast the turbines would be viewed 'down the line' which would have the effect of greatly limiting the proportion of the field of view affected by the turbines
- **Viewpoint 3** on a bend in the C4006 road above Low Moresby looking north-west (approx 2.9 km from the nearest turbine) from the elevated Moresby Moss ridge to the south-east of the windcluster. The ridge offers the only such opportunities for relatively close-range views from locally elevated viewpoints, and the C4006 is a minor road which carries a limited volume of local traffic. The direction of view from viewpoint 3 is almost perpendicular to those of Viewpoints 2 and 4, and it presents a array of 7 widely spaced turbines which occupy much of the field of view. The lower parts of the turbine towers are hidden below the ridgeline of the intervening Lowca ridge, and the turbines would be seen against a backdrop of sea and sky.

[NOTE: The view illustrates the ridgeline as it currently appears ie prior to completion of restoration works at the Park House Farm open-cast mining site. Plans submitted to the County Council indicate that the site will be restored to a landform which is very close to the

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original landform, and which will result in the raising of the ridgeline as seen in this view by several metres, which will further reduce turbine visibility.]

- **Viewpoint 4** in Whitehaven Harbour, adjacent to the Old Quay, looking north (approx 4.6 km from the nearest turbine). The photomontage illustrates the view from the outer harbour in which the harbour boats and structures occupy the foreground, the turbines appear in the middle distance as features of the clifftop skyline, with the urban and industrial development of Workington, including the Workington Oldside wind turbines, visible in the far distance (10 km +).

The sensitivity of viewers/viewpoints potentially affected

7.5.9 The visual impact of a development on various categories or combinations of viewer/viewpoint potentially affected has been considered in terms of their sensitivity to the development, as follows:

high sensitivity viewpoints

principal views from residential properties, public rights of way

medium sensitivity viewpoints

sporting and recreational facilities, major routes (eg A595(T))

low sensitivity

industrial sites

The magnitude of visual impacts

7.5.10 There is general agreement that the visual impact of a windfarm reduces with increasing viewing distance, and that it is also influenced by a range of other factors, including weather conditions and the presence of landscape features and landform within the field of view. Although opinions vary in the prediction of the magnitude or level of visual impact at any given distance, the study published by ETSU 'The Visual impact of Windfarms' (October 1994) provides some guidance as to the degree of visual intrusion or influence which may potentially occur, by considering the way in which, given conditions of reasonably clear visibility, the visual influence of a wind turbine development declines with increasing distance. The following zones, which are not absolute and assume an unobstructed view of the whole wind farm, are adapted from those suggested in the ETSU study and have been used in the preparation of this assessment:

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0 - 2 km

- The wind farm would generally be a **prominent feature** in the landscape.
- The turbines would occupy a large proportion of the field of view and appear large in scale, particularly within 500m.
- The colour of the turbines and movement of rotor blades would be obvious.

High
Magnitude
visual impact

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2 - 5 km

- The wind farm would generally appear as a **clearly visible intrusive feature** in the landscape.
- The wind turbines would appear fairly large in scale, but would not dominate the field of view, as other landscape features attract the eye as panorama widens
- Rotor blade movements would continue to attract attention.

High-medium
or medium
magnitude
visual impact

5-7.5 km

- The wind farm would still be a **visible landscape feature** but less distinct and noticeable;
- The apparent size of wind turbines would be much reduced and they would recede into the wider panorama and generally not appear intrusive.
- Rotor blades not generally apparent, and blade movement would be visible only in good visibility.

Medium or
Medium-Low
magnitude
visual impact

7.5 km or
greater

- The wind farm would appear as a **small feature which belong to a distant landscape**.
- Wind turbines would be indistinct and only apparent in specific views or particular weather or lighting conditions
- Rotor blade movement not normally apparent.

Low magnitude
visual impact

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7.6 ANALYSIS OF POTENTIAL VISIBILITY

General Visibility

7.6.1 Unless views are interrupted by intervening features such as buildings vegetation or minor landform, the towers and blades of all 7 turbines would potentially be visible at a distance of approximately 2.2 km in views southwards along the coast from the Salterbeck and the southern outskirts of Workington, in which the turbines would appear as features of the cliff top horizon (see photomontage 2). Views of the windcluster would also be available from some limited locations in the central and northern parts of Workington including Oldside, (6km) from Siddick (9 km), and from more elevated land to the north of Maryport (

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15+ km), but these views would be viewed within the context of intervening urban development. The full blades only of all 7 turbines would potentially be visible from the Winscale /Hunday area (5-6 km distant) to the south-east of Workington, but not from the Winscales windfarm site. Blade tips only of 5-6 or 7 turbines may potentially be visible from the Lillyhall estate (2.7 km), although the large scale industrial buildings would interrupt many views. The coastal ridge on which Seaton is located, to the north of the Derwent valley would potentially have some views of all 7 turbines at a distance of 8 km. The ridge would obstruct views from much of the lower lying coastal land further to the north.

7.6.2 Western low-lying parts of Parton, adjacent to the coast would not have views of the turbines but more elevated eastern parts of the town located adjacent to the A595(T) may have views northwards along the coast of the blades of all 7 turbines. Views of parts of the towers and blades of all 7 turbines would also be available from elevated parts of Bransty (4 km distant), and would appear as features of the cliff top horizon. Views of the windcluster from Whitehaven would be highly restricted, and only available from parts of the outer harbour area (see photomontage from viewpoint 4) and from the Kells/Woodhouse areas of Whitehaven (5 km), where the full tower and blades or half tower and blades of all 7 turbines would potentially be visible except where urban development interrupts views.

7.6.3 Distant views of the towers and blades of all 7 turbines would also be available in conditions of good visibility from the North Head of St Bee's Head Heritage Coast (9.5 km) but not from the village of St. Bees. The elevated ridge which rises to Moresby Moss would also have views of the towers and blades of all 7 turbines at a distance of 2.6 km (see photomontage from viewpoint 3) but the Moresby Moss ridge would obstruct potential views from much of the area which lies further to the east. The Lowca ridge would obstruct views of the turbines from much of the Lowca Beck valley, including the town of Distington (1.9 km). The windcluster would not be visible from either Cleator Moor or Egremont, nor from Cockermouth to the north.

7.6.4 Distant views of the windcluster from the Lake District National Park (minimum distance of 11.5 km) would generally be restricted to the high western fells such as Lank Rigg, Mosser Fell and Blake Fell, and only available in conditions of clear visibility. It would not however be visible from Ennerdale Water nor from Lowes Water.

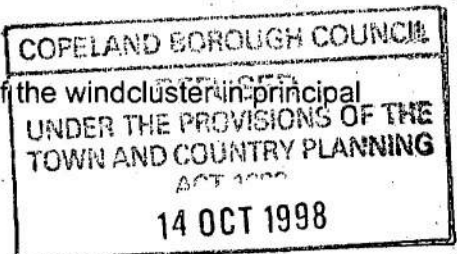
Local Visibility

7.6.5 **Figure 9** confirms that the landform of Lowca ridge would be effective in interrupting potential views of the windcluster from the east and south in the Lowca Beck valley, and from many locations within Lowca. More elevated parts of the Lowca ridge would have views of some parts of the turbines, depending on the extent to which landform interrupts views.

7.6.6 The ZVIs included in **Figure 9** predict that local visibility of the windcluster in principal ground level views is predicted to be as follows:

Lowca

- Micklam House, Lowca Primary School, Micklam Cottages, a terrace of 6 houses, all adjacent to the C4001 - up to half of the tower and full blades of all 7 turbines potentially visible;
- 2 pairs of semi-detached houses (Ghyll Grove) on bend in C4001 road - blades of up to 3-4 turbines potentially visible



- Estate of semi-detached properties on Ghyll Grove - no views of turbines
- West and East Croft Terrace adjacent to C4001 - no views of turbines
- East Road, Solway Road, Vale View and southern side of Meadow View and Croft Head - no views of turbines
- Northern side of Meadow View and Croft Head - blade tips or half blades of 1-2 turbines potentially visible
- Properties at Stamford Hill & Stamford Hill Farm - no views of turbines

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Scattered farmsteads and isolated residential properties

- Park House Farm and Micklam Farm - up to half of the tower and full blades of all 7 turbines potentially visible;
- Green House Farm and Sykes Whinn - up to full blades only of all 7 turbines potentially visible;
- Foxpit House - up to half of the tower and full blades of all 7 turbines potentially visible;
- Jubilee House adjacent to C4001 road - blade tips of 1-2 turbines potentially visible
- Harrington Parks Farm, Harrington Parks Cottages - up to full blades only of 5 turbines potentially visible;

Properties on the southern edge of Harrington

- Approx 5 properties on High Close, and a further 15-20 properties on southern side of Grayson Green - up to full blade only of 5-6 or 7 turbines potentially visible

Moresby area

- Moresby Hall, Moresby Farm and St Bridget's Church - blade tips only of 1-2 turbines potentially visible
- Howgate - blade tips or blades only of 1-2 turbines potentially visible
- Commongate, Ghyll Brow, Millgrove, Middle Gill Farm - full blades only of 5-6 turbines potentially visible
- Roseneath - full blades only of all 7 turbines potentially visible
- Low Moresby - up to half towers plus full blades of all 7 turbines potentially visible

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7.7 THE SIGNIFICANCE OF VISUAL IMPACTS

7.7.1 In order to predict the **significance of the visual impact** of the Lowca windcluster in a structured way, it is necessary to consider potential *impact magnitude* (ie change in existing view) in relation to the *sensitivity* of the particular viewers/viewpoints affected. The following categories have been used in this assessment:

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- **Substantial impact significance:** where the windcluster would cause a major change in the existing view of high or medium sensitivity receptors
- **Moderate impact significance:** where the windcluster would cause a moderate change in the existing view of a medium sensitivity receptor or a major change in the view of a low sensitivity receptor
- **Slight impact significance:** where the windcluster would cause a minor change in the existing view of high or medium sensitivity receptors

7.7.2 Intermediate categories which span the levels defined above have also been used in order to accommodate other combinations of impact magnitude and viewpoint sensitivity.

Potential Visual Intrusion

7.7.3 Using the Zone of Visual Influence analyses presented as **Figures 8, 9 and 10**, the following aspects of visibility have been assessed for a number of specified properties/locations:

- number and elements of turbines potentially visible
- approximate distance between the viewpoint and the closest turbine,
- the magnitude of the potential impact (ie potential change in view)
- the significance of the potential visual impact, which takes into account a range of relevant factors which may reduce levels of impact significance, such as intervening vegetation or buildings, orientation of principal views etc as indicated in the text

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TABLE 8A SUMMARY OF PREDICTED VISUAL IMPACT

Property/Location	Para. nos.	Distance to nearest turbine	Predicted Magnitude of impact	Comments	Significance of impacts
• Micklam House, School, Micklam Cottages, 2 houses on Ghyll Grove Lowca		0.8 km	High or High-medium	Landform will screen much of turbines but blades will appear in open views to NW	Substantial
• Ghyll Grove estate (most), Lowca		0.9 km	Nil	Screened landform by	No impacts
• West and East Croft Terraces, East Road, Solway Road, Croft Head (most) Lowca		1.2 km	Nil	Screened landform by	No impacts
• N side of Meadow View and Croft Head, Lowca		1 km	Low	Minimal visibility turbine	Slight
• Stamford Hill, Stamford Hill Farm		1.4 km	Nil	Screened landform by	No impacts
• Park House Farm Micklam Farm		0.5 km	High		Substantial

• Foxpit Cottage		0.42 km	High	Oblique views only	Substantial
• Green House, Syke Whinns		0.80 km 1.1km	High-medium	Blades only visible	Substantial-Moderate
• Harrington Parks		1.1 km	High-medium	Blades only visible	Substantial-Moderate
• Jubilee House		1.5 km	Low	Minimal turbine visibility	Slight
• Moresby Hall, Church and Moresby Farm		1.8 km	Low	Minimal turbine visibility	Slight
• Parton (old town)			Low	Minimal turbine visibility	Slight
• High Close in High Harrington		1.9 km	High-medium	Blades only visible	Substantial-Moderate
• some properties in Harrington, Salterbeck, southern parts Workington		2-4 km	High-Med or Medium	turbines seen on clifftop horizon from elevated viewpoints	Substantial-Moderate or moderate
• Distington		2 km	Nil	Screened landform by	No impacts
• Lillyhall Estate		3 km +	Medium	Low level of visibility & some screening by buildings, low sensitivity viewpoints	Slight
• some properties in Bransty,		3.2 km	Medium	turbines seen on clifftop horizon from elevated viewpoints	Substantial-Moderate or Moderate
• some properties in Howgate, Moresby, adjacent to A595(T)		2 km	Low	Minimal turbine visibility	Slight
• Whitehaven Harbour		4.6 km	Medium	turbines seen on clifftop horizon	Moderate
• High Park ridge		5.2 km	Medium-low	In general blades only visible	Slight
• Workington Oldside		6-7 km	Medium-low	Distance and low sensitivity reduce significance	Slight
• Winscale / Hunday		5 km	Low	Blades only visible	Slight
• some properties in Kells/Woodhouse, Whitehaven		5.5 - 7 km	Low	Buildings screen or interrupt some views.	Moderate-slight or slight
• Cleator Moor		8 km	Nil	Screened landform by	no impacts
• Egremont		12 km	Nil	Screened landform by	no impacts
• some properties in Seaton		7.5 -9km	Low	Some screening by buildings	Slight
• Cockermouth		15 km	Nil	Screened landform by	No impacts
• St Bees Head Heritage Coast		9.5 km	Low or nil	Turbine blades may be undiscernible	Slight
• elevated viewpoints within the LDNP		10 km +	Low or nil	Turbine blades may be undiscernible	Slight or nil

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7.8 OVERALL ASSESSMENT OF VISUAL IMPACT

7.8.1 The potential visual impact of the Lowca windcluster is assessed as follows

Substantial impacts on some views from

Micklam House, Lowca School, Micklam Cottages, 2 pairs of semi-detached houses on Ghyll Grove, Lowca, Foxpit Cottage, Park House Farm, Micklam Farm

Substantial - moderate impacts on some views from

Green House, Syke Whinns, Harrington Parks, High Close in Harrington, some properties in Harrington, Salterbeck, southern parts Workington, some properties in Bransty.

Moderate impacts on some views from

some properties in Harrington and Salterbeck, southern parts Workington, some properties in Bransty, Whitehaven Harbour

Moderate-Slight impacts on some views from

some properties in Kells/Woodhouse, Whitehaven,

Slight impacts on some views from

some properties in Howgate, Moresby adjacent A595(T) High Park ridge, Workington Oldside, some properties in the Winscale / Hunday area some properties in Seaton parts of the St Bees Head Heritage Coast, some elevated viewpoints from within the Lake District National Park

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No significant impacts in views from

properties in Distington, Cleator Moor and Egremont most properties in Lowca most properties in Whitehaven many properties in Workington some parts of the St Bees Head Heritage Coast, many elevated viewpoints from within the Lake District National Park

7.9 CUMULATIVE EFFECTS AND INTERVISIBILITY

7.9.1 Wind turbines are already a feature of the West Cumbrian landscape, and the Lowca windcluster would contribute further to the cumulative or collective effects of windfarms on

the landscape when assessed in conjunction with other existing and permitted wind turbine developments.

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7.9.2 Within the context of wind turbine developments, cumulative impacts may be regarded as the effects that a number of windfarm developments may have ~~in combination~~ on views from specific locations and, more generally, on impressions of the landscape character of an area which may be gained whilst travelling through it. These impacts principally concern effects on landscape and visual character; direct physical impacts, such as the loss of hedgerow, are usually sufficiently slight that they can probably be discounted from a wider, more strategic overview.

The Combined Visibility of Existing and Permitted Wind Turbine Developments in West Cumbria

7.9.3 In order to assess the potential for the Lowca windcluster to result in cumulative effects on the landscape, the existing "baseline" situation ie the combined potential visibility of existing and permitted wind turbine developments within the area must first be examined. This involves the following 3 sites which are indicated on Figure 1 :

- Workington Oldside - 9 turbines located a minimum of 6 km from the Lowca Windcluster site
- Siddick - 7 turbines located a minimum of 9 km from the Lowca Windcluster site
- Winscales - 11 turbines (permitted but not yet constructed) - to be located approximately 6 km from the Lowca Windcluster site

7.9.4 As the Workington Oldside and Siddick windfarms are located immediately adjacent to each other, and separated only by the West Coast railway line, they are perceived as a single development in many views and have been treated in this way for the purposes of cumulative impact assessment.

7.9.5 The windfarm site at East Town End Farm, Winscales, is located within farmland classified as 5a 'Ridge and Valley' lowland, the same landscape type as that identified at Lowca. It was originally approved by Allerdale Borough Council for the development of a 7.2 MW windfarm of 24 no. wind turbines. Subsequently, Allerdale Borough Council approved a revised application for the site, which reduced the numbers of turbines from 24 to 11. The turbine model is to be selected from five alternatives nominated by the developer, which range in height between 61.5 m and 64 metres to blade tip. The development at Winscales has failed to secure a NFFO contract under either of the NFFO 3 or NFFO 4 rounds of bidding. There is no realistic prospect of any windfarm of this size being developed in the absence of a NFFO contract.

7.9.6 Despite this, the Winscales windfarm has, for the purposes of cumulative impact assessment, been treated as if it were an existing scheme, constructed using 11 turbines each 64 metres in overall height, using information supplied by the developer. The existing situation against which the proposed Lowca windcluster is assessed represents therefore an extreme 'worst case' scenario which, in the absence of a NFFO contract for the Winscales site, is most unlikely ever to be realised.

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Approach to the Assessment of Cumulative Impacts

7.9.7 The prediction of the cumulative impacts of wind turbine developments is complex. Techniques for appraisal are still evolving, and most recent assessments are based on computer-generated analysis of:

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- **combined potential visibility**, which indicates the maximum extent of areas within which a view of a turbine of any of the windfarms under consideration could be available. These are derived by aggregating the ZVI analyses for each individual development;
- **potential intervisibility**, which indicates the maximum extent of areas in which views of two or more wind turbine developments could potentially be available. These are derived by overlaying the ZVIs of each individual development to see where "visual overlaps" between developments occur.

7.9.8 Using information supplied by the operators concerned, detailed computer-generated analyses of the **potential intervisibility** of the existing Workington Oldside/Siddick and permitted Winscales developments have been prepared, in order to assess the extent and significance of existing cumulative effects of wind turbine installations in West Cumbria. These analyses are illustrated as Figure 10 and effectively represent the 'baseline situation' against which the potential cumulative effects of the Lowca windcluster proposal has been assessed.

7.9.9 Given the small size and generally compact nature of the developments within West Cumbria, each development is regarded as a discrete landscape feature, as they are generally perceived in the landscape in this way, particularly from a distance.

7.9.10 Figures 10 and 11 are once again extreme 'worst case' ZVI analyses which register potential visibility on the minimum possible occurrence of visibility, including where potential views would be confined to the blade tips of a single turbine within a development and effects would be, to all intents and purposes, of no significance.

Intervisibility between existing/permitted sites - the existing situation

7.9.11 **Table 8B** provides a summary of the areas within West Cumbria which are indicated on Figure 10. It represents the existing situation ie those areas which currently have potential for views of more than one windfarm. It is reasonable to conclude that the existing situation regarding cumulative turbine visibility is one which is acceptable to respective planning authorities. The areas are arranged to reflect the various categories of viewing distance/visual prominence described in paragraph .

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Table 8B Summary of Existing Intervisibility

Distance from windfarm	Existing areas with intervisibility of 2 sites	Existing areas with intervisibility of 3 sites
Up to 2 km	None	None
2 - 5 km	<ul style="list-style-type: none"> • northern parts of Workington • southern parts of Workington including Salterbeck • ridge farmland between Winscales and Stainburn • Seaton and its surrounding ridge land • Great Clifton 	None
5 - 7.5 km	<ul style="list-style-type: none"> • intermediate ridge farmland to the south-west of Great Broughton vicinity of Greysouthern, • land to the south-west of Winscales including Hunday, High Harrington • northern part of the Lowca ridge 	None
7.5 - 20 km	<ul style="list-style-type: none"> • elevated west-facing fells of the Lake District National Park (including Ling Fell (373 m), Whinlatter (517 m), the Gasgate Crags (706 m) Mosser Fell, Watch Hill and Burbank Fell (447m)) • the North Head of St Bee's Head • Bridekirk and elevated land to the north of Cockermouth • land to the south and east of Greysouthern • from Dean and Dean Moor • farmland and minor settlements on intermediate ridge including Gilgarran, Pica, and Tivoli/Quality Corner to the north-east of Whitehaven. 	None

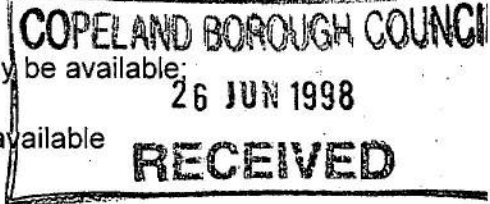
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Intervisibility between existing/permitted windfarm sites, plus the proposed Lowca Windcluster - Potential future situation

7.9.12 Detailed computer-generated analyses have also been prepared (Figure 11) which combine the visibility of existing/permitted windfarms (as presented on Figure 10) with the predicted visibility of the proposed Lowca windcluster. They permit assessment of the effect that the Lowca windcluster may have on existing patterns of intervisibility and cumulative visual effects within West Cumbria. The analyses represent the potential future situation and are presented in **Figure 11**.

7.9.13 **Table 8C** is based on a comparison between Figure 10 and Figure 11. It provides a summary of the predicted changes in areas of existing intervisibility within West Cumbria which would occur if the Lowca windcluster were to be constructed as proposed. These changes include

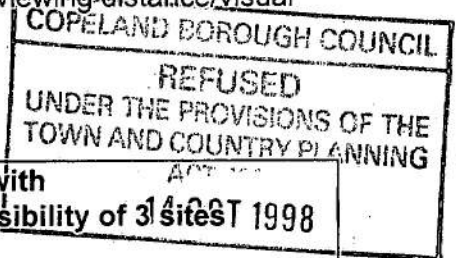
- additional areas from which views of two windfarms may potentially be available;
- areas from which views of all three windfarms may potentially be available



7.9.14 The areas are arranged to reflect the various categories of viewing-distance/visual prominence described earlier.

Table 8C Summary of Additional Intervisibility

Distance from a windfarm	Additional Areas with intervisibility of 2 sites	Land with intervisibility of 3 sites
Up to 2 km	None	None
2 - 5 km	<ul style="list-style-type: none"> • land to the south-west of Winscales including parts of the Lillyhall industrial estate, High Harrington and farmland on the northern end of the Lowca ridge • Gilgarran and surrounding farmland 	<ul style="list-style-type: none"> • limited area of farmland to the north of High Harrington • residential suburbs on southern side of Workington including parts of Moorclose, Westfield, Salterbeck and Mossbay • industrial land on the western side of Workington
5 - 7.5 km	<ul style="list-style-type: none"> • farmland on south-west facing side of Lowca Beck valley • High Park ridge • farmland and opencast workings to the west of Branthwaite 	<ul style="list-style-type: none"> • ridge farmland between Winscales and Stainburn • northern parts of Workington, including Oldside site • land to the south-west of Winscales including Hunday, High Harrington • northern end of the Lowca ridge
7.5 - 20 km	<ul style="list-style-type: none"> • land to the north-east of Maryport • Great Broughton, and wooded farmland to the south of Broughton 	<ul style="list-style-type: none"> • elevated west-facing fells of the Lake District National Park (including Emberton High Common, Whinlatter



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| <p>Moor</p> <ul style="list-style-type: none"> • Tallentire and Dovenby plus farmland to the north of Cockermouth • southern end of the Lowca ridge including the Lowca windcluster site • some western parts of Whitehaven • further areas of farmland on south-west facing side of Lowca Beck valley • limited areas of Ennerdale Fells | <p>(517 m), the Gasgate Crags (706 m) Mosser Fell, Watch Hill and Burbank Fell (447m))</p> <ul style="list-style-type: none"> • the North Head of St Beeis Head • High Park ridge • Bridekirk and elevated land to the north of Cockermouth • land to the south of Greysouthern • Dean • farmland and minor settlements on intermediate ridge including Gilgarran, Pica, and Tivoli/Quality Corner to the north-east of Whitehaven. |
|--|---|

Analysis of Potential Cumulative Effects resulting from the Lowca Windcluster

0 - 2km

7.9.15 The physical separation between the existing/permitted windfarms and proposed Lowca windcluster is such that the construction of the Lowca windcluster would not result in any potential close range (ie within 2km), high magnitude cumulative visual effects.

2km - 5km

7.9.16 Some limited areas of land located between 2km - 5km of a windfarm site would potentially be subject to cumulative visual effects as a result of the Lowca windcluster. However much of the additional area from which views of parts of two windfarms would potentially be available is an area of farmland and scattered farmsteads on the west facing side of Lowca Beck valley to which there is limited public access, and industrial land within the Lillyhall industrial estate which is considered to be of low sensitivity. Although the village of High Harrington would potentially be affected, the two windfarms would not be visible within 5km in a single view, and in many cases potential views from properties within the village are likely to be obstructed by intervening buildings. In addition, potential views of the Lowca windcluster would in almost all cases involve potential views of turbine blades only. If the permitted windfarm at Winscales remains unconstructed, these predicted cumulative impacts would not occur.

7.9.17 Limited areas of farmland to the north of High Harrington, industrial land on the western side of Workington and residential suburbs on southern side of Workington, from which both the Workington Oldside/Siddick and Winscales windfarms are already potentially intervisible, are predicted to have opportunities for potential views of 3 windfarms, although not within the same view. However public access to the farmland is restricted and within

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Workington it is likely that intervening urban and industrial development would greatly restrict potential views of the windfarm sites

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5km - 7.5 km

7.9.18 Additional areas in which two windfarms would be intervisible within a range of 5km - 7.5 km of a windfarm site would occur following the construction of the Lowca windcluster. These include further locally elevated areas of farmland on the southern end of the Lowca ridge, on the west facing side of Lowca Beck valley, on the High Park ridge to the east and farmland and opencast workings to the west of Branthwaite. Public access to the farmland is limited; however scattered farmsteads within these areas would have opportunities to view both the Lowca and Winscales windfarms within an extended panorama, leading to cumulative impacts of medium or medium-low magnitude. If the permitted windfarm at Winscales remains unconstructed, these predicted cumulative impacts would not occur.

7.9.19 Three windfarms would potentially be visible from the northern parts of Workington, including the port and the Oldside windcluster site, from ridge farmland between Winscales and Stainburn, from land to the south-west of Winscales including Hunday, from High Harrington, from the northern end of the Lowca ridge. These are all areas from which both the Workington Oldside/Siddick and Winscales windfarms are already potentially intervisible. Within Workington it is likely that intervening urban and industrial development would greatly restrict potential views of the windfarm sites, and public access to the farmland is limited; however scattered farmsteads within farmland may have opportunities to view parts of the three windfarm sites. At a distance of 5-7.5km, the windfarms would appear as visible features within a wider panorama, and where cumulative visual impacts occur these are likely to be of no more than medium or medium-low magnitude.

7.5 km - 20 km

7.9.20 At longer range, beyond 7.5 km, a broad scattering of sites on intermediate level ridge land and more elevated fells would have views of two windfarm sites and further more restricted areas which currently have views of two windfarms would have the potential to view three windfarms, often within a single or extended panoramic view. In many cases the blades only of turbines within the Lowca site have the potential to be visible, and at distances in excess of 7.5 km, these would be barely discernible.

7.9.21 In summary, the Lowca windcluster would not result in any potential close range (ie within 2km), cumulative visual effects. Opportunities for potential short-medium range intervisibility would be highly restricted and cumulative visual effects at distances between 2km - 5km are likely to be of no more than medium magnitude, and of limited significance. Where the windfarms are intervisible at a distance of 5-7.5 km, they would appear as visible features within a wider panorama, and cumulative visual impacts are likely to be of no more than medium or medium-low magnitude. The contribution of the Lowca windcluster to cumulative effects in long range would be negligible, as the turbine towers are not generally predicted to be visible and the turbine blades would be barely discernible at this distance.

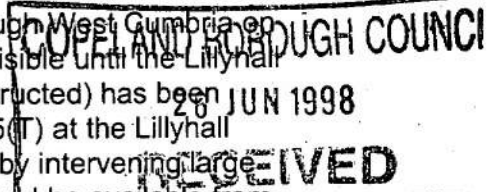
Potential Cumulative impacts in views from primary roads

7.9.22 The Lowca windcluster development could potentially add to perceptions of cumulative impact of windfarms in the views of those travelling through and within West Cumbria. However it would make very little contribution to existing levels of cumulative impact in the view of those moving through the area on primary routes

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7.9.23 **Figures 8 and 9** confirm that when travelling southbound through West Cumbria on the A595(T), the main coastal route, the site would not potentially be visible until the Lillyhall industrial estate is reached, and after the Winscales windfarm (if constructed) has been passed. Although views of the windcluster are predicted from the A595(T) at the Lillyhall estate, many views are likely, in reality to be interrupted or obstructed by intervening large scale industrial buildings, vegetation and minor landform. No views would be available from the road where the A595(T) passes through Distington, but oblique views of the blades or blade tips of a small number of turbines may be possible to the south of Distington, before the site is passed, but they would not be viewed in combination with any other windfarm.



7.9.24 When travelling northbound on the A595(T), no views of the Lowca windcluster are predicted from Egremont or from Whitehaven, until the northern outskirts of the town where the road rounds Briscoe Bank. From this point parts of the towers and full blades of all seven turbines at Lowca would be seen in combination with the eleven turbines of the Winscales site, if the Winscales windfarm is constructed. Given the very short distance within which views of the site from the road would potentially be possible, the contribution of the Lowca windcluster to cumulative impacts would be slight. No further views would be available from the A595(T).

7.9.25 In summary, although the Lowca windcluster would contribute to perceptions of wind turbines in the West Cumbrian landscape, its overall contribution to cumulative impacts in the views of those travelling through West Cumbria on principal routes would generally be very slight.

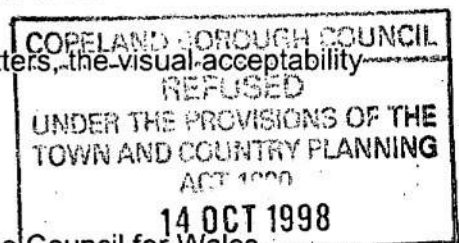
Public Perception of the Visual Impact of Windfarms

7.9.26 The foregoing assessment of visual impacts should not automatically be assumed to refer to adverse visual impacts - impacts may be either beneficial or adverse, depending on the subjective perceptions of the viewer.

7.9.27 The impact of any industrial structure is very much a matter of personal opinion. Individuals may see them as obtrusive elements, graceful structures or as being of no consequence to the landscape. Thus the visibility of a windfarm, even in close views, does not necessarily imply a lack of acceptability by those living in the area.

7.9.28 Three principal studies addressing, amongst other matters, the visual acceptability of windfarms in the UK have been published:

- Cemmaes Windfarm Sociological Impact Study - ETSU
- Wind Turbine Power Station Monitoring Study - Countryside Council for Wales
- Attitudes towards Windpower: a survey of opinion in Cornwall & Devon - ETSU



7.9.29 Although all three considered relatively large developments, the results are the best available guide to windfarm acceptability in the UK. General evidence from the continent suggests that smaller clusters of 10 turbines or fewer prove rather more acceptable than larger farms.

7.9.30 The Cemmaes study surveyed the response of the local population to a windfarm of 24 turbines in rural Wales. Respondents were interviewed both immediately after the windfarm was constructed and again 1 year later. On both occasions, 86% were in favour of the project. At the 1 year point, 92% said they were not bothered by the visual impact of the

turbines, and 75% of those who could see the windfarm from their homes were favourably disposed towards it. Overall, while 57% of the sample could see turbines from their houses, only 2% were against the windfarm.

7.9.31 The CCW study considered views of three windfarms, Llandinam (103 turbines, the largest UK windfarm), Rhyd-y-Groes (24 turbines) and Llangwryfon (20 turbines). The survey was conducted in some detail, and included a survey of attitudes towards wind power in a control area where no developments were planned. Overall, 86% of respondents concluded that the developments had caused little disruption and 68% that they had little impact on the area, despite their size.

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7.9.32 The Cornwall and Devon study considered public attitudes before and after the construction of the first commercial UK windfarm at Delabole, and involved survey both in the immediate vicinity of the windfarm and in Exeter. The results showed that concern about visual impact, noise nuisance, disturbance to wildlife etc. reduced substantially amongst the Delabole population once the windfarm was operational. Again, the overall conclusion was that the development had in fact altered local attitudes positively towards wind energy and that worries of local residents proved unfounded once the turbines were up and running.

7.10 MITIGATION

7.10.1 A variety of measures have been adopted by Powergen Renewables in the design and layout of the wind turbine development, in order to optimise the integration of the scheme into the existing landscape, and to minimise, as far as possible any adverse impacts on existing landscape and visual character.

Mitigation Of Impacts On The Landscape

7.10.2 The proposed layout of the seven turbines has been reduced by the developer from the original proposal for 8 turbines, in order to take account of concerns expressed at the time regarding the likely visibility of one turbine in particular. The proposed layout is designed to respond, as far as possible, to the linear character imposed on the local landscape by the prominent ridge landform, by the former mineral railway track, and by the coastline itself.

7.10.3 This approach to siting is consistent with Countryside Commission guidelines (Wind Energy Development and the Landscape) which suggests that the windfarm should reflect

"whatever most closely harmonises with the grain, scale and pattern of the landscape within which they are situated".

Mitigation Of Visual Impacts

7.10.4 The seven wind turbines would be sited within a landscape of no more than moderate quality, where they would be largely screened from the closest settlement of Lowca by the intervening landform of Lowca ridge.

7.10.5 New tracks required to give access to the turbines and switchgear house would be allowed to naturally colonise with pasture grasses and so blend in with the surrounding grazing land.

7.10.6 The turbine towers and blades would be light grey in colour, in order to reduce the level of potential visual impact.

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7.10.7 Electrical connections within the site would all be underground and transformers would be sited within turbine towers, in order to reduce potential visual impacts.

Residual Impacts

7.10.8 As the mitigatory measures described in paragraphsXXX have been taken into account in the development of the windcluster scheme, the levels of potential impacts indicated in paragraph XX may be considered to be residual impacts, for the duration of the economic life of the windcluster.

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7.11 SUMMARY and CONCLUSIONS

7.11.1 The windcluster site is located on a narrow strip of improved, semi-improved and rough pasture immediately inland of the sea cliffs at Lowca. It lies almost mid-way between Whitehaven and Workington, the two principal urban centres of the West Cumbrian coast. The A595(T) trunk road passes nearby, adjacent to which is the Lillyhall industrial estate.

7.11.2 The windcluster would be located outside of the Lake District National Park, and outside of any areas designated as County Landscapes. It would therefore lie outside of landscapes of either national or local landscape importance.

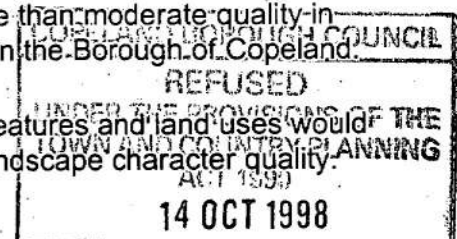
7.11.3 The local landscape is characterised by a distinctive linear lowland ridge which runs roughly parallel to the coast. It forms part of a wider area of rolling ridge and valley farmland of permanent pasture. Land on the western side of the Lowca ridge is windswept, open and medium-large in scale. The area has a long industrial tradition which has resulted in a legacy of engineered features within the landscape.

7.11.4 As with all wind energy developments, the Lowca windcluster would have impacts on the landscape and visual character of the local area, and measures have been taken in the planning of the windcluster which would reduce or mitigate any adverse effects. These include:

- siting and layout of the turbines, switchgear house and internal access tracks would, as far as possible, be sympathetic with the grain and pattern of the landscape. In siting the turbines to the west of the Lowca ridge, they would be screened in many views from Lowca and the local area by intervening landform;
- use of non-reflective surface finishes in light grey colour would reduce the potential for glinting and visual intrusion.
- re-establishment, through natural colonisation, of pasture grasses on access tracks
- adoption of separation zones between turbines and nearby residential properties would minimise the potential for shadow flicker and nuisance due to noise.
- installation of underground electrical connections within the site would minimise visual "clutter" on the site.

7.11.5 The local landscape is assessed as being of no more than moderate quality in relation to other areas of national and local designation within the Borough of Copeland.

7.11.6 The established presence of other non-agricultural features and land uses would tend to reduce the degree of impact of the windcluster on landscape character quality.



B.A. Pomfret

Although the development of the Lowca windcluster would inevitably result in a major change of substantial-moderate significance in the character of the landscape within and immediately adjacent to the application site, its impact locally on the character and quality of the surrounding ridge and valley landscape is likely to be of no more than moderate significance, while impacts on wider regional landscape character and quality, which is characterised by considerable urban and industrial development, is predicted to be of no more than slight significance.

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7.11.7 A number of photomontages have been prepared from viewpoints which were selected in response to guidance by Copeland Borough Council. These illustrate how the windcluster is predicted to appear from a number of local viewpoints. In addition, computer-generated analyses (ZVIs) illustrate the areas of West Cumbria, within 20 km of the site, which could potentially have views of a turbine blade or tower, and indicates the likely impact of the turbines in the view. More detailed analyses of potential visibility within Lowca are also presented.

7.11.8 Residual visual impacts would vary; glinting may occur on rare occasions, but is unlikely to be of significance, and shadow flicker is not expected to be a problem.

7.11.9 Visual intrusion would occur to varying degrees. However the ZVIs predict that there would be no significant impacts in views from most properties in Whitehaven and Lowca, and no properties in Distington, Cleator Moor and Egremont would be affected. Views from many properties in Workington would also be unaffected.

7.11.10 The windcluster is only likely to result in potential visual impacts of substantial significance in some views from a very limited number of local properties, including Micklam House, Lowca School, Micklam Cottages, and 2 pairs of semi-detached houses on Ghyll Grove, Lowca, together with a number of scattered individual properties including Foxpit Cottage, Park House Farm, and Micklam Farm.

7.11.11 Impacts of substantial - moderate significance may occur in some views from scattered farmsteads, some properties on High Close and on the southern edge of Grayson Green.

7.11.12 Residents of some properties in Harrington and Salterbeck, southern parts Workington, some properties in the Bransty, Kells/Woodhouse and harbour areas of Whitehave may experience impacts of moderate or moderate-slight significance in some views.

7.11.13 Impacts of only slight significance may occur in some views from some properties in Howgate, Moresby, on the High Park ridge, in Seaton and north Workington, in the Winscale / Hunday area of Allerdale, from viewpoints on the North Head, the St Bees Head Heritage Coast and elevated viewpoints from within the Lake District National Park

7.11.14 There are 2 existing or permitted wind turbine sites, Workington Oldside/Siddick and Winscales, within the neighbouring district of Allerdale, West Cumbria. The proposed Lowca windcluster would be seen, from some viewpoints, in combination with the Oldside/Siddick and Winscales sites. However it would not result in any potential close range cumulative visual effects, and at distances between 2km - 5km cumulative visual effects are likely to be of no more than medium magnitude where they occur at all, with no more than medium or medium-low magnitude cumulative visual impacts at distances of 5-7 km. The contribution of the Lowca windcluster to cumulative effects in long range views

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would be negligible, as the turbine towers are not generally predicted to be visible and the turbine blades would be barely discernible at this distance.

7.11.15 The Lowca windcluster would not be visible at all, or visible from only limited stretches of primary routes within the area. Although it would contribute to perceptions of wind turbines in the West Cumbrian landscape, and its overall contribution to cumulative impacts in the views of those travelling through West Cumbria on principal routes such as the A595 would generally be very slight.

7.11.16 The proposed windcluster would add to the number of individual wind turbine developments within West Cumbria. However the small size of the site and the rolling ridge and valley character of the local landform would assist with the integration of the Lowca windcluster within the landscape of West Cumbria and make the site broadly acceptable within the terms of informal guidance issued by Cumbria County Council as "Wind Energy Development in Cumbria" (July 1997)

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