



Appeal Decision

Inquiry opened on 23 July 2009
Site visits made on 3 August and 27
October 2009

by **Andrew Pykett** BSc(Hons) PhD MRTPI

an Inspector appointed by the Secretary of State
for Communities and Local Government

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Decision date:
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Appeal Ref: APP/Q1153/A/06/2017162

Land to the south east of North Tawton and the south west of Bow

- The appeal is made under section 78 of the Town and Country Planning Act 1990 against a refusal to grant planning permission.
- The appeal is made by RES Developments Ltd against the decision of West Devon Borough Council.
- The application Ref: 8250/2005/OKE, dated 10 November 2005, was refused by notice dated 31 January 2006.
- The development proposed is nine 3-bladed horizontal axis wind turbines, electricity transformers, access tracks, crane hardstandings, control building, sub-station, met mast, temporary construction compound and met masts.
- The inquiry sat for 13 days on 23, 24, 27-31 July, 3 August, 20-23 and 26 October 2009.
- This decision supersedes that issued on 22 March 2007. That decision on the appeal was quashed by order of the Court of Appeal.

Preliminaries

1. At the Inquiry an application for costs was made by RES Developments Ltd against the West Devon Borough Council. This is the subject of a separate Decision.
2. The original public inquiry into the above appeal was held in November 2006. The appeal was successful but the decision was challenged in the High Court. Although the challenge was unsuccessful, the appeal decision was subsequently quashed by the Court of Appeal in July 2008. The decision was therefore returned for re-determination taking account of all matters raised. I held a pre-inquiry meeting in Spreyton to consider the arrangements for the inquiry on 1 June 2009. Two third parties were granted Rule 6 status for the purposes of the inquiry. These are: the Den Brook Judicial Review Group Ltd (DRJRG), and the Campaign to Protect Rural England (CPRE).
3. An Environmental Statement (ES) was prepared in 2005 under the provisions of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 to accompany the application. Volume II of the ES is accompanied by Volume I, which comprises a non-technical summary, and Volume III is a series of plans, drawings, maps, photographs and photomontages. Supplementary Environmental Information (SEI) was prepared and issued in 2006 in three equivalent volumes on behalf of the appellant and before the first inquiry. It pays attention to the landscape and visual assessment of the scheme, together with assessments of its archaeological impact, and its effect on scheduled ancient monuments and the

historic landscape. Before the second inquiry further Supplementary Environmental Information was prepared. It comprises a revised noise assessment and a capability statement. I have taken account of all the submitted material. Evidence submitted on behalf of the appellant indicates that, although not recorded on the application form, the turbines would be removed after 25 years. I have taken this into account also.

4. I carried out a formal visit to the site and its surroundings with the parties on 3 August. I visited the 6 locations at which background noise recordings were made on 27 October. I made unaccompanied visits to various locations including Cosdon Hill, Ramsey Hill, and Belstone Tor; relevant locations on the Tarka Trail, and the Two Moors Way; and the bridleways between Staddon Farm and Higher Nichols Nymett, and that to the north-east of Burrow.

Decision

5. I allow the appeal, and grant planning permission for nine 3-bladed horizontal axis wind turbines, electricity transformers, access tracks, crane hardstandings, control building, sub-station, met mast, temporary construction compound and met masts on land to the south east of North Tawton and the south west of Bow in accordance with the terms of the application, Ref: 8250/2005/OKE, dated 10 November 2005, and the plans submitted with it, subject to the conditions included in the schedule at the end of this decision.

Main issues

6. In addition to the matters to which I have referred above, I have also taken account of material submitted at the application stage; at the time of the first inquiry; the first appeal decision and the subsequent court proceedings; and, of course, the evidence and submissions made at the second inquiry. Taking account of all these matters and of my own assessments resulting from my visits to the site and its surroundings, I have concluded there are two main issues in this case.
7. These are:
 - (i) the effect of the proposed development on:
 - the character and appearance of the surrounding area, including the historic environment;
 - local ecology, especially bats;
 - the living conditions of local residents, especially in relation to possible noise disturbance; and
 - (ii) whether any harm resulting from the first main issue could be sufficiently regulated by conditions, or would be outweighed by the benefits of renewable energy generation, to justify the development.
8. There is inevitably a good deal of overlap between the matters considered at and identified as main issues in the first inquiry. However, that decision was referred to and quashed by the courts largely on the basis of the manner in which possible noise disturbance had been considered. Although the consequences of the scheme in relation to noise were raised at the first inquiry,

it is evident that it was not the subject of specialist evidence by the principal parties to the inquiry. As I have recorded above, that inquiry also pre-dated the SEI prepared in 2009. The council's position in relation to this matter remained the same for both inquiries – it raises no objection to the scheme on noise grounds, but notwithstanding this I have identified it as a component of the first main issue as far as this re-determination is concerned.

Reasons

9. The nine turbines would be sited on land within the valley of the upper reaches of the Den Brook – a tributary of the River Yeo which itself flows to the north into the River Taw. The appeal site covers an area of approximately 2km² (200ha), although the land actually occupied by turbine bases and ancillary development would amount to just over 3½ha. The ES records that the actual make of turbine has not yet been selected, but at its maximum extent it would not exceed a height of 120m above ground level. The blades would be about 45m in length, and the tower would be approximately 75m in height. The turbines would be generally arranged on a south-west/north-east axis over a distance of about 1500m. The scheme includes the erection of two temporary 80m high monitoring masts, together with a network of 4.5m wide access tracks and a centrally located temporary construction compound. The control building and sub-station would also be centrally located. The necessary grid connection does not form part of the appeal proposal, but I understand the current proposal would follow a route to the west and north-west to North Tawton.
10. The ES is based on turbines with a nominal capacity of 1.65 – 2.3 MW, and, subject to the weather and ground conditions, the development operations would take up to about 12 months. The scheme envisages the delivery of most plant and materials from the A30 at Whiddon Down, along the A382 and the A3124 towards North Tawton, and thence to a new site entrance off the A3072. Some minor road improvement and traffic management works would be necessary at Whiddon Down, at the railway bridge on the A3124, and at the A3124/A3072 junction.

Character and appearance

11. The appeal site lies in the gently rolling agricultural landscape which characterises that part of mid Devon between Dartmoor to the south and Exmoor to the north. The site and its surroundings fall within two of the character areas included in the Countryside Agency's character map of England – area 148: Devon Redlands, and area 149: The Culm. The former area extends from the east and includes most of the appeal site itself. Amongst other key characteristics, reference is made to the hilly landscape of villages, hamlets, farmsteads, hedgebanks and winding lanes. The village of Bow lies within this area. However, this character area forms a relatively narrow extension into The Culm. This includes extensive areas to the north, south and west, and it comprises the vast majority of the land between Dartmoor and Exmoor.
12. Reference is made, amongst other key characteristics, to rolling open pasture separated by many small valleys; to the wide views across a remote landscape, and the scattered hamlets and farms connected by winding sunken lanes.

Similar areas are identified in Map 5 of the *Devon Structure Plan 2001 to 2016* (2004). Policy CO1 of the structure plan refers to the more finely defined Landscape Character Zones. On the basis of this assessment both the appeal site and most of the surrounding land to the north and west fall within area 8 – the Mid Devon Farming Belt. Much of the surrounding land to the south falls within area 16 – the Tedburn St Mary Area. Policy CO1 (Landscape Character and Local Distinctiveness) requires that the distinctive qualities and features of Devon’s Landscape Character Zones should be sustained and enhanced.

13. A still more detailed study was carried out on behalf of the West Devon Borough Council to identify the Landscape Character Types (LCTs) within the council’s area. The assessment was issued in June 2008. On the basis of this analysis the appeal site falls within LCT 1F – farmed lowland moorland. The description refers to the open, gently rolling or flat landscape where the pastoral farmland and rough ground has an elemental, empty character, dominated by wet unenclosed moorland. Most specifically in relation to the appeal proposal, the management guidelines advise that the introduction of wind farms would have the potential to impact on and dilute the local landscape character. The surrounding area to the north, west and south falls within LCT 1D – inland undulating uplands. This type consists of open rolling and sloping uplands mainly in pastoral cultivation with little arable land. It has an open downland character locally. It is subject to the same guidance in relation to wind farms as area LCT 1F.
14. The appeal site lies close to the boundary between West Devon Borough Council to the west, and Mid Devon District Council to the east. The land to the east of the appeal site, including the settlements of Bow and Zeal Monachorum, falls within the mid Devon farming belt (gently rolling farmland) landscape type. Key characteristics include the rolling, rounded medium-scale hilltops with convex valley sides falling gently towards major river valley floors. The area has a strong agrarian flavour, and the historic village centres are considered to be features of higher quality than much of the landscape.
15. Policy NE10 (Protection of the countryside and open spaces) of the *West Devon Borough Local Plan Review* (2005) records that development within the countryside outside settlement limits or not otherwise in accordance with the policies of the plan will not be permitted unless it provides an overriding economic or community benefit which avoids unacceptable harm to the distinctive landscape character of the area. Natural features which contribute to the character are protected, including views. However, in relation to wind energy proposals this policy is essentially subject to Policy PS10 (Energy production in West Devon). For this supports wind energy proposals provided they have no significant adverse impact on: the qualities and special features of the natural landscape or townscape; nature conservation; or the conditions of those living and working nearby. In this respect the local plan accords with the contents of structure plan Policy CO12 (Renewable Energy Development). While it too seeks to promote renewable energy development in the context of the sub-regional target of 151MW by 2010, such development is rendered subject to its impact on the qualities and special features of the landscape and on the conditions of those living or working nearby.
16. The northern edge of the Dartmoor National Park lies about 5½kms to the south of the appeal site. Between the two – and at its closest about 2kms to

the south and south-west of the site – the land is designated as an Area of Great Landscape Value. Structure plan Policy CO4 records that such areas are particularly sensitive to new development, and local plan Policy NE9 is similarly protective. However, in the determination of renewable energy schemes both paragraph 24 of Planning Policy Statement (PPS) 7: *Sustainable Development in Rural Areas* and paragraph 15 of PPS22: *Renewable Energy* promote the use of criteria-based policies in preference to such local designations.

17. The highest parts of the Dartmoor National Park lie along its northern edge, and there is a distinct boundary between the surrounding agricultural landscape and the moorland itself. Other than in the vicinity of Whiddon Down, the designated area is essentially defined by the A30 dual-carriageway, but the proximity of the high and open moorland to the surrounding agricultural landscape facilitates an appreciation of the qualities and characteristics of both areas in both directions.
18. Amongst other matters, structure plan Policy CO2 (National Parks) records that the application of particular care is necessary to ensure that no development outside the Park is permitted which would damage its natural beauty, character or special qualities. Similarly, local plan Policy NE7 (Dartmoor National Park) seeks to avoid development which would have an unacceptable adverse effect on the setting of the Park's landscape, or on viewpoints within the Park. The significance of national designations is also recognised and acknowledged in PPS22. Although paragraph 14 records that buffer zones should not be created around designated areas, it also specifies that the potential impact of renewable energy projects close to their boundaries will be a material consideration to be taken into account in the determination of planning applications. At the inquiry my attention was drawn to the contents of the *Dartmoor National Park Management Plan 2007*. It includes a comprehensive list of Dartmoor's special qualities. Amongst these, reference is made to the extensive views across Devon which the moor is able to provide.
19. Policy EN 1 of the *Regional Planning Guidance for the South West* (RPG10) (2001) also provides for both the strong protection of the region's nationally important landscape areas and the conservation and enhancement of local character. The *Regional Spatial Strategy for the South West* (RSS) is in the course of preparation. The draft revised version incorporating the Secretary of State's proposed changes was issued in July 2008, and I am therefore able to lend it significant weight in this appeal. Policies ENV1 and ENV2 also seek to protect and enhance the region's natural and historic environment, and Policy ENV3 records that particular care will need to be taken to ensure that no development is permitted outside the National Parks which would damage their natural beauty, character and special qualities.
20. During my visits to the appeal site and the surrounding area I was able to consider all the views expressed on behalf of the both the principal parties and those who have made representations. I visited the four closest settlements – North Tawton, Bow, Spreyton and Zeal Monachorum – together with most of the viewpoints discussed, including those on Dartmoor. I have considered the impact of the scheme in terms of its effect on both landscape character and visual amenity.

Landscape Character

21. At the ES stage it was concluded that the wind farm would result in a re-definition of the local landscape character zones. The new zone would cover the wind farm site itself and its immediate environs, covering an area of about 8km². Within the new zone the turbines would be dominant. Beyond this zone it was assessed that there would be a buffer zone up to approximately 2kms in width where the turbines would be co-dominant with the character of the existing zones.
22. At the inquiry the council's landscape witness indicated his agreement with the principle that the proposed development would be sufficient to result in the changes to zones described in the ES. However, in his view a significantly larger area would be affected. He considered the turbines would be prominent in an area defined by North Tawton, Bow and Spreyton – an area of approximately 30km². In contrast, the appellant's landscape witness noted that the site is a localised area of larger scale more open landscape, including open views where the scale of the landscape can be readily appreciated. He makes a distinction between the area of the site itself and the smaller scale, undulating and more vegetated landscapes beyond, in which the turbines would have more limited visibility with increasing distance. In his view the development would be dominant in an area defined by the A3072 to the north, Broadnymett to the east, Ham Farm and Itton to the south, and Cocktree Moor and Halse Farm to the west. In the surrounding area, defined by North Tawton, Zeal Monachorum, Bow and Spreyton the turbines would be significant but not dominant. He considered the change would be insufficient to result in the creation of a localised wind farm landscape.
23. I have referred above to the narrowness of the Devon Redlands character area and to The Culm to the north, south and west. In my opinion the distinction is readily visible in the landscape, and its lack of width renders it more sensitive to change. I believe the development proposed would be sufficient to result in a localised zone in which the turbines would effectively dominate and define the landscape within and around them. However, I also agree with the appellant's view that within The Culm and beyond, the landscape character, combined with distance, would help to attenuate this dominance quite rapidly. In landscape character terms I do not believe the development would give rise to a co-dominant surrounding zone.

Visual Effects

24. As I have recorded above, the appeal site lies in the upper reaches of the valley of the Den Brook. More accurately, seven of the proposed turbines would lie on land which drains into the Den Brook. The two most southerly turbines would be sited on land which drains into the unnamed stream which crosses Itton Moor. It too flows into the River Yeo, just to the south-west of the Den Brook/Yeo confluence. Neither of the valleys is deeply incised, and from some vantage points the topography of the site takes the form of a relatively extensive shallow basin which is overlooked from higher ground in all the surrounding directions. It is evident from the site itself however that the land is not flat. The two streams are separated by a low ridge and the land rises gently from the north-east to the south-west. The turbines would occupy sites between about 122m AOD (T5) and 160m AOD (T1). With increasing

distance, in my view the topography of the site itself becomes less significant – a perception which to my mind would be reinforced by the number, distribution and height of the turbines.

25. The ES includes a total of 13 photographs of the site and its surroundings, with a photomontage for each viewpoint indicating the appearance of the proposed turbines. Photographs were also taken from an additional 11 locations and wireframes prepared. These were supplemented with the submission of the initial SEI by revisions to the photomontages for viewpoints 1, 3, 4 and 9, and by the addition of 4 further viewpoints – A, B, C and D. At the inquiry I also had the benefit of photographs from 25 viewpoints supplied by the landscape witness for the DBJRG. I have considered the photographic material and the wireframes within the terms in which they were supplied – as an aid to my experience of visiting the site and many of the viewpoints.
26. The site is crossed by a railway line which I gather is subject to modest seasonal use by passenger trains, but I saw on my visit that visibility from the line would be severely curtailed by trees. The closest publicly accessible vantage points to the turbines would be to the south where a minor road from the A3124 at Itton Cross passes through the hamlet of Itton, before crossing Itton Moor and turning south towards Spreyton. The closest turbine (T3) would be about 150m from the lane. I agree with my predecessor however that the more attractive prospects of the appeal site and its background are to be obtained from the north. From this general direction, and especially from the north-east, the bulk of Dartmoor is invariably present. Quite apart from the difference in height, the distinction between the agricultural landscape of the foreground and middle-distance, and the moorland leading to the horizon, enables the viewer to appreciate and value the interdependence of its components.
27. ES Viewpoint 1 from close to Nichols Nymett Moor Cross is an example of the views available from the minor road which connects North Tawton with Zeal Monachorum and Bow. The appellant draws attention to the low proportion (14%) of the 30km radius zone of theoretical visibility study area from which the turbines would be theoretically visible. Although this proportion would be further reduced by characteristic high hedgebanks and hedges, I noted on my visits that prospects were available in the direction of the appeal site and beyond through field gates, lanes and tracks. Such apparently fortuitous glimpses are always gratifying in the countryside. From this and similar vantage points the viewer would be at about 150-200m AOD at a distance of just over 2kms to the nearest turbine. The complete height of most of the turbines would be visible, but the panorama is extensive and the essential components of the scene are on a large scale. I recognise the turbines would exceed the scale of trees and farmsteads by many times, but on the contrary, their size would complement the scale of the scene as a whole. In this sense I do not depart from my predecessor's view that the turbines would be framed by the landscape. It follows that in my opinion the proximity of the site to Dartmoor would not detract from the appreciation, experience or prospect of the national park. Although the turbines themselves would be very large, I consider that in number and extent the project would not be excessive in relation to its landscape setting.

28. From the viewpoint of ramblers or riders one of the most significant routes from which the turbines would be visible is the bridleway between Higher Nichols Nymett and Staddon Gate – passing through Westacott Barton and Staddon Farm. Although most of the route lies to the north of thick or high hedges, the turbines would be readily visible through field gates. To the east of Staddon Farm the right of way lies on the south side of the field boundary. In any event, riders would be able to see over most of the hedges. At its western end the bridleway would be about level with the hub height of the lowest of the turbines, but the route gently declines to about 160m AOD. The impact of the turbines would thus be rendered greater by their height in relation to the potential vantage points from the north. From the viewpoints of the observer however, the turbines would be offset from the highest parts of Dartmoor. The northern slopes and tops of Cosdon Hill, Belstone Tor and Yes Tor would all appear to the south-west of the observer. Notwithstanding the proximity of the observer to the turbines, in my view they would not seriously diminish the impact or presence of this part of the moor. At a maximum blade tip height of 280m AOD (T1) this would still be well below the three high points of 550m (Cosdon Hill), 479m (Belstone Tor) and 619m AOD (Yes Tor). The prospect to the south-west from the bridleway to the north-east of Burrow is at about the same height, but in this case the turbines would be directly in line with Dartmoor. I conclude that from this particular location the scheme would have a harmful effect on visual amenity.
29. SEI Viewpoint A is to the north-east of Sanford Barton and is representative of views from the A3072. It is from a lower elevation than Viewpoint 1 and the distance to T5 is only 1.2kms. The northern tors and hills of Dartmoor form the south-eastern horizon, but one effect of the lower level would be to increase the perceived height of the planned turbines. From this location the balance between the turbines and their landscape setting would not be as evident, and the height of the turbines would be emphasised by their breaching of the skyline. From this location also I consider the turbines would have a harmful effect.
30. ES Viewpoint 2 provides an indication of the impact of the proposed development on North Tawton. In this regard I agree with the council's landscape witness who considered at the inquiry there is a distinction to be made between the visual impact of wind energy schemes on individual dwellings on one hand and whole settlements on the other. Although the *Guidelines on the Environmental Impacts of Windfarms and Small Scale Hydroelectric Schemes*¹ suggests a buffer zone is desirable in relation to both forms of human occupation of the land, a rural village or small town has a social and community function which cannot similarly apply to an individual dwelling. To my mind the impact of a wind energy scheme on the landscape setting of such a settlement must be a matter of greater significance than the effect of the same scheme on isolated dwellings. In the case of North Tawton however the theoretical zone of visual influence included in the ES indicates that most of the town would be out of sight of the proposed turbines. Visibility of the development would be confined essentially to an area at the southern entrance to the settlement. The upper parts of the turbines would be visible

¹ CD49, paragraph 2.4.4

over the horizon to the south-east, but in my view they would be sufficiently distant not to have an adverse effect on visual amenity.

31. A gateway at Itton Cross (ES Viewpoint 3) is a good vantage point for the assessment of the visual effect of the proposed turbines from the west. At this location the viewer would be above the level of the turbine bases, and the topographical context – the shallow basin – of the development would be evident. The fields in the foreground are quite large, and the ridge to the east of North Tawton provides a degree of enclosure. In contrast to the prospects from the north however, there is no complementary upland area and the turbine blades would be seen against the background of the sky. Although in clear weather Exmoor is visible to the north-east, in my view it is too distant to make the same contribution as Dartmoor does in views from the north.
32. The proposed wind farm would be theoretically visible from Spreyton looking north-west. However, the principal street through the village follows an east-west route blocking visibility to the north. ES Viewpoint 8 is from a footpath at the northern end of the village. I saw on my visit that there are variations in the prospect along the footpath, but in my view the resultant differences in the visibility of the wind farm would have only a minor effect. From this viewpoint the landscape has a different character with smaller fields, more hedgerow trees and steeper slopes. The trees would partially obscure some of the turbines, the closest of which would be some 2.9kms away. I do not dispute that the turbines would change the prospect from this part of Spreyton, but in my view the overall effect would be limited.
33. Bow would be a little closer to the nearest turbine than Spreyton, but more significantly, the valley of the River Yeo effectively connects the village with the appeal site. The village is sited on rising land on the east side of the valley and the turbines will therefore be clearly visible – especially from houses with south-west facing windows in, for example, Hobbs Way, Nymet Avenue, Collatons Walk and Gregory Close. ES Viewpoint 7 indicates the visual impact of the turbines from the village hall and playing fields. The photograph shows some of the houses on streets in the south-western quadrant of the village. From the viewpoint selected three of the turbines would be almost in line – an arrangement which in my view is bound to increase the impact of the rotation of the blades by continually creating and recreating a series of angles. On the other hand, the proximity of the turbines to each other would result in the wind farm occupying a lower proportion of the total scene than equivalent views from the more southern or northern viewpoints. As the viewpoint illustrates, the scene includes the northern hills of Dartmoor – principally Cosdon Hill. A wind farm would be an uncompromisingly new and man-made addition to the landscape, but in the light of its design, form and purpose I would not regard it as a challenger to Dartmoor. Nor do I consider the view of Dartmoor would be blighted. In my view a wind turbine has a readily comprehensible design simplicity, and although the proposed turbines would undoubtedly be large, I do not consider the number and distribution of turbines would be inconsistent with its landscape setting as seen from the village.
34. The churchyard at Zeal Monachorum would be nearly 4.3kms from the nearest turbine. The surrounding village occupies a low hill-top and the Zone of Visual Influence plans included in the ES indicate that the turbines would be visible at both blade tip and hub heights. Many potential views from village streets

would be interrupted by buildings however. I do not believe the appeal proposal would have as substantial a visual impact on the village as the parish council fears. Nevertheless, I do not dispute the parish council's observation that, from the churchyard, the most easterly turbine (T5) would be directly in line with the summit of Cosdon Hill. Indeed, this is confirmed by the appellant's wireframe view. However, the photomontage which is derived from the wireframe also indicates both that the blades would remain below the horizon, and the majority of the turbines would be hidden by foreground or middle-distance trees. In my opinion the effect of the visible turbines from the churchyard would be limited. I consider the impact on the setting of St Peter's Church as a listed building later in this decision.

35. The height, proximity and status of the Dartmoor National Park justify an assessment of the visual effects of the proposal from greater distances to the south and south-west. The ES Viewpoints include: 4 Whiddon Down; 5 Ramsley Hill; 9 Yes Tor; and 10 Cosdon Hill. All the locations are at significantly higher altitudes and distances than the other viewpoints. Whiddon Down is at 261m AOD and 7.0kms to the nearest turbine; Ramsley Hill is at 260m AOD and 7.4kms; Yes Tor is the highest and most distant at 614m AOD and 14.1kms; and Cosdon Hill is at 550m AOD and 9.5kms.
36. I have taken account of the designation of Dartmoor as a national park. In the context of a wind energy scheme this necessity is perhaps most notably acknowledged in paragraph 14 of PPS22. This records that the potential impact on designated areas of renewable energy projects close to their boundaries will be a material consideration to be taken into account in determining planning applications. In addition, paragraph 21 of PPS7 notes that the national parks have been confirmed by the Government as having the highest status of protection in relation to landscape and scenic beauty. However, in my view it does not follow that significant change is therefore to be avoided, and in any event, over-reliance on the designated status of Dartmoor would be inconsistent with the requirement of paragraph 19 of PPS22 that the landscape and visual effects of renewable energy schemes will vary on a case by case basis.
37. I have already referred to the special qualities of Dartmoor and in particular to the extensive views across Devon which it affords. In the context of the northern edge of the moor, I have taken account of the intervisibility between Dartmoor and Exmoor. The latter is also a national park. At their closest the northern edge of Dartmoor is about 38kms from the southern edge of Exmoor, and on clear days the two moors are readily visible from each other. From Exmoor however the turbines would be about 32kms away at their closest. They would be indistinct, and motion of the blades would be lost. I recognise that the intervisibility of the moors helps to define their setting, the appreciation of both, and the intervening area of Devon; but the impact on the prospect from Exmoor would be very limited. In my view the distance is too great to fall within the terms of paragraph 14 of PPS22.
38. On the contrary, and although I understand from evidence submitted on behalf of CPRE the appeal site does not fall within the area of a parish adjoining the moor, the proximity of the appeal site to Dartmoor renders the potential impact of the turbines on this national park an important material consideration. I have already recorded my views in relation to the effect of the scheme where

Dartmoor forms part of the background. From the opposite direction I believe there is a distinction to be made between viewpoints where no part of the moor is visible and those where the prospect includes part of the designated area. Although ES Viewpoint 4 at Whiddon Down would provide an elevated view of the turbines, no part of the designated area would be included, and it is difficult to contend that from this location there would be any effect on the moor. I acknowledge however that such circumstances would apply in only a limited number of cases.

39. To my mind, the other ES Viewpoints which include part of the designated area in the foreground are of much greater significance. There is no dispute as to the visibility of the proposed turbines from both the tops of hills and tors and from the slopes below them. Another of the special qualities referred to in the national park's management plan is the absolute peace which can still be experienced, contributing to the strong sense of wildness on the open moorland. This aspect of the experience of the moor is emphasised in visual terms by its openness and the almost complete lack of trees. Some of these qualities are evident in ES Viewpoints 9 (Yes Tor) and 10 (Cosdon Hill) and from Belstone Tor. The openness of the moor also results in far fewer interruptions to visibility than those which occur in the agricultural and settled landscape closer to the appeal site.
40. I have considered whether the openness and wildness of the moor, as aspects of its natural scenic beauty, would be compromised or diminished by the visibility of the turbines. One of the principal benefits of the extensive views across Devon from the edges of the open moorland area is to be found in the contrast it affords and appreciation of the differences it makes possible. The lower ground is settled by small towns, villages, roads, railways and farms. It is an agricultural and occupied landscape where human activity is continually present. Notwithstanding its size and impact, in my opinion a self-evidently man-made structure such as a wind farm is more appropriately and compatibly sited in such an area. From the highest vantage points the tops of the turbines would be well below the level of the observer, and although the same would not apply to ES Viewpoint 5 (Ramsley Hill), this lies within a different landscape character zone under the Devon County Council appraisal. It falls within the enclosed moor (Zone 30), which virtually surrounds the high moor (Zone 31).
41. I have taken account of the status afforded to Ramsley Hill through its identification by the Ordnance Survey as a recognised viewpoint. It is also located on the Dartmoor Way long distance recreational route. I understand the chimney to the north-west of the viewpoint is a remnant of former mining activity, and this too sets it apart from the prospects provided by the high moor. Although the turbines would appear above the horizon from this vantage point, I believe their number and distribution would ensure that the development as a whole would be but one component of the scene. I do not think the turbines would detract from the prospect as a whole.
42. I have considered the impact of the appeal proposal from vantage points on two other long distance footpaths – the Tarka Trail and the Two Moors Way. The Tarka Trail passes the site to the west along the valley of the River Taw. At its closest it is just over 2kms away and it follows a north/south direction. Along this length it is either close to the river or on minor roads between hedgebanks. The ZVI plans indicate that the turbines would be only partially

visible from this part of the footpath, and I do not consider they would have a serious adverse effect. The footpath also crosses an area of open moor below Belstone Tor from which the turbines would be visible at a distance of approximately 10kms to the north-east. At this distance and altitude the turbines would constitute but one component of an extensive prospect. In my view the wind farm would be sufficiently distant from and below the general level of Dartmoor to neither diminish nor harm the essential qualities of either the moor or the trail. The Two Moors Way also follows a north/south route and at its closest passes just under 5kms to the east of the appeal site. Although I believe the turbines would be visible through a gateway at Whelmstone Cross they would constitute no more than a glimpse – much of the path in the vicinity is between thick hedges which circumscribe the outlook to the west.

Historic Environment

43. Both the council and the DBJRG are concerned about the effect of the scheme on aspects of the historic environment. At the inquiry I received evidence from the Devon County Archaeologist on behalf of the council. There are a number of archaeological sites in the vicinity of the appeal site, including most notably, scheduled ancient monuments to the west and north-east.
44. That to the west includes a complex of large Roman military enclosures together with series of smaller enclosures and ring-ditches in fields around The Barton on the east bank of the River Taw. One of the camps survives as low earthworks just to the south of the railway which crosses the appeal site. It would be about 2kms from the nearest turbine (T10). The course of the Roman road leading to the site also crosses the appeal site, and, as I saw on my visit, it is also visible in part. The Tarka Trail long distance footpath passes to the west, but the camp earthworks themselves are obscured by hedgerow trees. In any event, the council considers that the impact on the setting of the camp is not unacceptable². I agree.
45. In contrast, the council is concerned about the effect of the proposed development on the setting of the scheduled monuments near Bow. Amongst others, these include the site of a henge close to the south-west corner of the field to the south-west of Hampson Cross. I gather it is now considered the group of prehistoric monuments centred on the henge site were developed over a long period, perhaps from before 3000BC. The henge itself was probably constructed just before the end of the third millennium BC, and it would have been surrounded by a concentration of barrows and ring ditches. There is reason to believe the location had a ceremonial, rather than a strictly utilitarian, function.
46. My attention was drawn at the inquiry to the manner in which archaeologists now rationalise the relationship between such sites and their landscape setting. I understand this has grown in recent years, so that it can be said of many such monuments that they have a landscape role. More locally, there is no reason to distinguish between the archaeological importance of prehistoric monuments on Dartmoor – which happen to have been constructed from granite, from those in lowland Devon – which would have been construed of

² It is noted in passing that the latest proposed grid connection route passes through the Scheduled Monument. Scheduled Monument Consent is necessary for a number of works affecting such ancient monuments.

earth or timber. Most specifically, it is considered the principal means of access to the henge would have followed an east-west axis, but that the earth mound on its south side could have constituted a representation of Cosdon Hill visible on the horizon. Thus the setting of the henge would have a direct relationship with the horizon of the principal landform to the south-west.

47. The appeal site lies almost directly between the henge site and Cosdon Hill, as illustrated in SEI Viewpoint C. There would be no impact on the monument from the works themselves, but its setting would be affected, and I agree with the council that the intrusion of development into the setting of a monument – albeit one which is not upstanding – can impair our appreciation of its function, location and context. As is recorded in paragraph 6 of PPG16: *Archaeology and Planning*, archaeological remains are part of our sense of national identity and they are valuable both for their own sake and for their role in education, leisure and tourism.
48. However, paragraph 27 of PPG16 refers amongst other matters to a presumption against proposals which would have a significant impact on the setting of visible remains. It thus effectively makes a distinction between the settings of upstanding monuments and those which are now only or largely below ground level. There must remain a substantial element of debate and speculation about the design and form of the henge, and about the extent to which it would have sought to derive its inspiration from the surrounding landscape. In any event, the proposed development would not obscure Colson Hill – its presence would remain clear and obvious, and I cannot see that the proposed development would hinder the archaeological interpretation of the monument site. I conclude that notwithstanding its archaeological importance, the effect of the turbines on the setting of the monument is of limited significance. In my view the appeal scheme would breach neither the terms nor the purpose of structure plan Policy CO8 (Archaeology) or local plan Policy BE7 (Archaeology and Sites of Local Importance).
49. St Martin's Chapel at Broadnymett is both a scheduled ancient monument and a Grade II* listed building. It forms part of a small complex of buildings at Broadnymett, and would be just under 800m from the nearest turbine (T5). The chapel dates from the late thirteenth century and it is no longer in use, other than as an agricultural store. It originally served the ancient parish of Broad Nymett – an area of only about 17ha (42 acres) – before it was absorbed into the parish of North Tawton. SEI Viewpoint B shows both the chapel and its proximity to the proposed wind farm.
50. I saw on my visit to the chapel that its setting is already severely affected by agricultural buildings and activities, although the effect of these is ameliorated by an extensive growth of trees and bushes close to the chapel itself. In contrast to the henge, the chapel is both a visible and tangible expression of historic interest. The photomontage reveals that it would be possible for the chapel and the turbines to be simultaneously visible, but in my view the chapel can now have only a very limited setting. It is a small building in a very secluded location, and to my mind its impact is confined to a very limited surrounding area. I do not consider the setting or the experience of visiting the chapel would be diminished by the existence of the proposed turbines. In this respect I depart from the view expressed by my predecessor as the chapel becomes visible only from close locations.

51. My attention has been drawn to a number of other listed buildings in the vicinity. Broadnymett Farmhouse and Crooke Burnell Farmhouse are both Grade II buildings within about 800m of the nearest proposed turbines. Although in my view the setting of a farmhouse usually includes a larger area than a dwelling which has no such functional relationship with the surrounding land, in neither case do I consider this extends as far as the proposed turbines. The topography surrounding the farmhouses would remain undisturbed, and I do not believe the turbines would compromise or diminish their appearance or quality as listed buildings.
52. There are four listed houses (two with barns) on the sloping land to the north of and overlooking the appeal site. They are: Staddon Farmhouse; Westacott Barton and barn; Nichols Nymett House; and Upcott Farmhouse and barn. The buildings are between 1800m and 2160m from the nearest turbines, and Westacott Barton and Upcott Farmhouse are both Grade II* buildings.
53. Each of the dwellings occupies a similar setting in the sense that they lie in the open countryside below the crest of the hill slope. In my view, and in each case, their settings are limited to the surrounding fields and enclosures, and although the turbines would be visible when Westacott Barton is approached from the north, I do not believe its setting would be impaired. Indeed, although the barn is sited close to the bridleway, the house occupies a much more secluded location which curtails an appreciation of its interest. I consider furthermore that the turbines would be too distant to have a harmful effect on the setting of the buildings. Similar points arise in relation to Staddon Farmhouse. Although this is more visible from the bridleway, the proximity of the house to the right of way would prevent the turbines from interfering with an appreciation of the building. I saw on my visit to Nichols Nymet House that although the prospect to the south across the valley to Dartmoor must be a benefit for those living in or visiting the house, its status as a listed building and its setting are understood and appreciated from much closer and in the opposite direction. I conclude that the settings of the listed buildings identified would not be seriously adversely affected, and that the scheme would not conflict with structure plan Policy CO7 (Historic Settlements and Buildings) or local plan Policy BE3 (Listed Buildings).
54. I have also considered the impact of the scheme on St Peter's Church at Zeal Monachorum. It too is a Grade II* listed building, and a particular concern of the Zeal Monachorum Parish Council. In its later submission the council reproduces a photograph taken from the north-east corner of the churchyard but including the east end of the church itself. The scene includes trees within the church yard and adjoining properties as well as the more distant landscape leading to Cosdon Hill. It is an attractive, concentrated and varied prospect to which the component parts all make their own valued contribution. I visited the location during my site visit. Although the trees would obscure some of the turbines, others would be visible in the middle distance with Cosdon Hill forming the background.
55. In my view the setting of a parish church can extend to far larger distances than those which apply to dwellings. Paragraph 2.17 of PPG15: *Planning and the Historic Environment* describes how the identification of the setting of a listed building can vary with the circumstances. I see no reason why in some cases this should not include the background landscape, especially when the

two elements of the scene (the building and the landscape) contribute so much to each other. However, the nearest turbine would be 4.3kms, and the top of Cosdon Hill is 15kms away. There is disagreement as to whether the blades would or would not just break the skyline, but in my view it is unlikely that, in most conditions, they would be as distinct as suggested by the parish council. Furthermore, the turbines would be below the ridge level of the church roof, and well below the top of the tower. In addition, the corner of the church yard from which the photograph is taken cannot be a frequently used route. I thus conclude that, notwithstanding their visibility, the turbines would not detract excessively from the setting of the building.

56. I have also given consideration to the effect of the proposed development on the setting of the relevant local conservation areas and on views out of them. It is suggested on behalf of the DBJRG that, particularly in relation to the Bow, North Tawton and Zeal Monachorum Conservation Areas, the turbines would intrude into the views of the valleys and the approaches towards the settlements. However, although at some locations it would be possible to simultaneously observe both the turbines and buildings falling within the conservation areas, the distances would be such that I do not believe they would seriously harm their character or appearance. Nor do I consider harm would result to views out of the areas sufficient to compromise the preservation of their character or appearance.

Conclusion on character and appearance

57. Except perhaps in a limited number of industrialised or urbanised locations, it will invariably be the case that modern commercial wind turbines will be out of scale with both the natural vegetation and other man-made structures in the vicinity. Similarly, it might have been expected within the context of the Devon landscape that the proposed wind farm would be too large for its landscape setting. The wind farm would be most closely observed from the minor road which passes through Itton, but this is only a lightly trafficked route. In contrast, the next closest route is the A3072, and this is relatively heavily trafficked. In my view the greatest visual harm resulting from the scheme would be experienced both on this route, and, to a lesser extent, from the bridleway to the north-east of Burrow. In this sense the scheme would therefore conflict with the landscape protection policies, or parts of policies, of the development plan to which I have referred – principally structure plan Policy CO1, local plan Policy NE10, Policy EN 1 of RPG 10, and Policy ENV1 of the emerging RSS.
58. There would certainly be an impact on the prospects towards, through and beyond the turbines at many other locations, but the development would be seen from greater distances and in the context of larger panoramas. From the north, and perhaps ironically, the presence and scale of Dartmoor would allow the comparatively smaller mass of the wind farm to provide a landscape context for the development. Similarly, from Dartmoor the distance from the site and the difference in height would ensure that the visual effect of the scheme would be manageable³. From these locations I believe the development would not be incompatible with the landscape protection policies

³ In this respect I believe the case is distinguishable from that at Yelland (CD27v) where, although the turbines would have been smaller and fewer, the site was on higher land significantly closer to the national park boundary.

of the development plan cited above. In relation to Dartmoor I see no overriding conflict with structure plan Policy CO2, local plan Policy NE7 or Policy ENV 3 of the RSS. Nor, in relation to the historical environment, do I see any overriding conflict with structure plan Policies CO7 or CO8, local plan Policies BE3 or BE7, or Policy ENV2 of the emerging RSS.

Local Ecology

59. An ecological assessment of the site taking particular account of protected species was carried out on behalf of the developer at the ES stage of the project in 2004. Amongst other matters the assessment noted a moderate to locally high level of bat activity, mainly associated with the hedgerows, woodland edges and wetlands. A total of seven species of bat was identified; the distribution suggesting that individuals were entering the site from roosts around the periphery. However, most of the bats were observed flying at between 2 and 10m above ground level and in this case the blades would not be closer than 30m above ground level. It was recognised that the noctule bat would be more vulnerable as it often flies between 10 and 20m above ground level.
60. The ES refers to the then level of knowledge concerning the interaction between bats and wind farms as inadequate to formulate a definitive impact assessment of the operational phase of the scheme. Since that time (and since the 2006 Inquiry) more guidance has been issued. Most notably, Natural England has published Technical Information Note TIN051: *Bats and Onshore Wind Turbines: Interim Guidance*. This in turn derives from Eurobats Publication Series No 3: *Guidelines for consideration of bats in wind farm projects* (2008). To minimise the risk to bat populations the Technical Information Note advises a 50m buffer around any feature (trees, hedges) into which no part of the turbine should intrude. On the basis of the proposed turbines in this case the DBJRG calculates that the base of each machine should be approximately 62.25m from trees and hedges. The DBJRG is also critical of the equipment used; of the length and time of day of the surveys; and the omission of surveys in April and October. Attention is drawn to the manner in which bats may be attracted to the moving parts of turbines, possibly in pursuit of insects which in turn are drawn by heat.
61. In response it was observed on behalf of the appellant that there are some notable differences between the bat populations of the United Kingdom and those in the rest of Europe. There is no large scale migration of bats in the UK for example, and the danger of building a wind farm on a migration route does not therefore arise. The survey conducted at the ES stage was undertaken on three evenings spread throughout the active season using the guidelines available at the time. In any event, the survey effort is a matter for the professional consultant, and the surveys conducted were adequate and sufficient. Further surveys would be unlikely to result in different or conflicting results. Most recently, barotrauma has been identified as a possible cause of death when bats come into close contact with wind turbines. This involves tissue damage where there is a rapid or excessive pressure change associated with the rotation of the blades.
62. The majority of bats at the site are common pipistrelles. Although it is considered these bats are at a medium level risk of collision, their population is

- not thought to be threatened. The parties agreed that the most vulnerable species found at the site is the noctule bat. It both flies at a higher level and does not adhere to linear features such as hedges. However, only low numbers were recorded, and it is not considered by the appellant that the proposed wind farm would significantly impact on the conservation status of the local populations.
63. The appellant acknowledges that, although no turbine would be located closer than 50m to woodland habitat, some would be located closer to hedgerows. I understand that this would only happen at locations near to relatively defunct hedgerows and/or areas of relatively low bat activity. It is considered this would minimize the overall impact on the conservation status of the local bat populations. Hedgerow enhancement would not take place at such locations, and the maternity roost (previously proposed for the centre of the site) has been dropped⁴.
64. I have considered the possible effect of the scheme on bats and on the local bat population in the light of the advice included in PPS9: *Biodiversity and Geological Conservation*. It records that the aim of planning decisions should be to prevent harm to biodiversity interests. If significant harm cannot be prevented, adequately mitigated, or compensated for, then planning permission should be refused. As far as protected species are concerned, planning permission should be refused where harm to the species or their habitats would result, unless the need for, and benefits of, the development clearly outweigh that harm.
65. Figure 6.6 of the ES reproduces the data from the bat surveys onto an OS base with the areas of high and moderate activity identified. The plan clearly illustrates the importance of both hedgerows and watercourses for foraging purposes. The principal routes are: the course of the Den Brook itself across Broadnymett Moor; the access track south of Sandford Barton towards the railway; the course of the Roman road; and the route of the minor road north-east of Itton leading to Itton Moor. Along these routes there appears to be only one turbine site (T1)⁵ which would be close to the existing hedgerow. The submitted layout plan indicates the centre of the turbine site would be about 60m from the hedgerow to the north.
66. I recognise that understanding the relationship between bats and wind turbines is a developing area, and the potential for surveys to become out-of-date exists. An additional survey using the latest equipment would doubtless have improved the extent and detail of our knowledge of the site. However, in my view the work carried out in 2004 constituted a thorough survey of the land, and I agree with the appellant that new surveys would be unlikely to reveal significantly changed circumstances. I do not dispute the danger that turbines present to bats, including the noctule bat. The scheme thus entails the threat of some harm to individuals, but not to roosts, and there is no suggestion that the turbines would constitute a threat to local bat populations.
67. The possibility of birds colliding with the turbines was also raised by the DBJRG. The ES noted the abundance of starlings at the appeal site, with a

⁴ See Figure 6.21 Rev 0.1 attached to Dr Holloway's Proof.

⁵ The site of T3 appears to have been incorrectly plotted on this plan. The site layout plan (Figure 3.1) shows the site some distance further north.

flock of approximately 21,000 recorded in December 2004. I understand there is a roost of many hundreds of thousands at Okehampton Camp about 9kms south-west of the appeal site, and the area is used for foraging. The DBJRG is particularly concerned that the assessment for the potential for collision may have been made on the basis of incorrect turbine heights. However, paragraph 6.2.5 of the ES correctly records the form of the proposed development and the maximum height of the turbines. In any event, I agree with the appellant that taking account of the abundance of the species, fatalities would be likely to be insignificant and not a threat to the breeding population.

Conclusion on Ecology

68. I therefore conclude in relation to this matter that the potential effect of the proposed development on local ecology has been the subject of detailed investigation and assessment, including special consideration for protected species. In my view the project is in conformity with the relevant parts of Policy EN 1 (Landscape and Biodiversity) of RPG 10; with structure plan Policy CO10 (Protection of Nature Conservation Sites and Species); and with local plan Policy NE6 (Protected Species).

Possible Noise Disturbance

69. Although structure plan Policy CO12 (Renewable Energy Development) is favourable to the provision of renewable energy developments, it is subject to the consideration of their impact on the conditions of those living or working nearby. Policy CO16 (Noise Pollution) provides greater definition. It records that development should not be located where it would result in a significant increase in the level of noise affecting existing land uses in the vicinity. The local plan specifies similar safeguards. The support for renewable energy in local plan Policy PS10 is subject to there being no significant adverse impact on the conditions of those living and working nearby, and Policy BE18 (Potentially Polluting Activity) states that noise generating development will not be permitted if it would be liable to increase unreasonably the noise experienced by the users of noise-sensitive development nearby.
70. Paragraph 22 of PPS22 also recognises that the renewable technologies may generate increases in noise levels. In addition to its suggestion that development plans might include minimum separation distances, it recommends the use of a report by the Energy Technology Support Unit (ETSU) of the former Department of Trade and Industry – *The Assessment and Rating of Noise from Wind Farms* (ETSU-R-97) – published in 1996. In this case the development plan does not set out any minimum separation distances, and the status of ETSU-R-97 is thereby enhanced. The Companion Guide to PPS22: *Planning for Renewable Energy* provides further advice. Amongst other matters, it records that well-specified and well-designed wind farms should be located so that increases in ambient noise levels around noise-sensitive developments are kept to acceptable levels with relation to existing background noise⁶. It too refers to ETSU-R-97 as relevant guidance on good practice which should be used when assessing and rating noise from wind energy developments.

⁶ Page 167, paragraph 41

ETSU-R-97

71. The purpose of ETSU-R-97 is recorded as being the description of a framework for the measurement of wind farm noise with indicative noise levels thought to offer a reasonable degree of protection to wind farm neighbours, without placing unreasonable restrictions on wind farm development or adding unduly to the costs and administrative burdens on wind farm developers or local authorities. It thus attempts to strike a balance between the environmental benefits of wind energy development on one hand (which are often expressed on a global scale), and the potential for environmental damage by noise pollution (which are assessed at a local scale). The guidance constitutes an exhaustive – even elaborate – examination of the issues relating to the assessment of wind turbine noise and its regulation, but it was recognised by the authors that it and its recommendations should be reviewed 2 years after publication⁷. However, there has been no review, and evidence submitted by the appellants indicates that there are no current plans to revise ETSU-R-97⁸.
72. It is recognised by the parties nevertheless that the commercial wind turbines currently favoured (and proposed in the current case) are materially larger than those considered by the authors of the report. At the inquiry it was clear there was agreement that ETSU-R-97 fails to pay adequate attention to the impact of wind shear resulting from atmospheric changes, and the manner in which wind turbine noise is propagated is not considered. Amongst many other matters, the report promotes a correlation between background noise levels at receptor locations with simultaneous measurements of the mean wind speed at 10m above ground level measured at the proposed site. Some of the acousticians who practice in this field fear that the failure to pay sufficient regard to variations in wind shear could result in significant errors when comparisons are made between background noise levels and wind turbine noise immission⁹ levels. A methodology has been identified which seeks to overcome this problem¹⁰.
73. The report (ETSU-R-97) refers to a number of source documents including PPG24: *Planning and Noise*, and BS 4142: 1990: *Method for rating industrial noise affecting mixed residential and industrial areas*. The latter records that, in relation to background levels, a difference of +10 dB or more indicates that complaints are likely, while a difference of +5 dB is of marginal significance¹¹. ETSU-R-97 favours the setting of noise limits relative to the background in a manner similar to that adopted in BS 4142, but it adopts a number of limits derived from different times of the day and different locations.
74. For small schemes or in remote locations away from noise-sensitive receptors the report recommends a simplified limit of 35 dB(A) $L_{A90,10min}$ for 10m high wind speeds up to 10m/s. This obviates the need for a background noise survey. In locations where a background survey is necessary – as in the current case – a night-time (23:00 – 07:00) limit of 43 dB or 5 dB above background, whichever is the greater, is specified outside the relevant building (usually a dwelling). This is derived from the 35 dB(A) sleep disturbance

⁷ CD61, pages 2 and 111

⁸ Document 32

⁹ As in 'to send in' or 'inject'; the correlative of emission

¹⁰ CD100, *Prediction and assessment of wind turbine noise*, Acoustics Bulletin March/April 2009

¹¹ CD62, paragraph 9

criteria cited in PPG24, with an allowance of 10 dB(A) made for attenuation through an open window, and 2 dB subtracted to account for the use of L_{A90S} rather than L_{AeqS} .

75. During the day-time the equivalent limit is 35-40 dB(A) or 5 dB(A) above background, whichever is the greater. The actual value for the day-time lower limit depends on an assessment of 3 factors – the number of dwellings in the neighbourhood of the wind farm; the effect of the limits on the number of kWh generated; and the duration and level of exposure. The day-time limits are also perhaps rather curiously based on the sleep disturbance criterion from which the night-time limit is derived. Strangely, the day-time lower limit thus appears to be lower than the night-time lower limit; but the night-time limit is derived from an internal standard. Finally, the report recommends a higher limit fixed limit of 45 dB(A) at dwellings occupied by those who are financially involved with the scheme. In such circumstances consideration should also be given to increasing the permissible margin above background, although the margin is not specified.
76. As is evident from the above paragraph, most of the various noise limits are precisely and numerically expressed. Theoretically, they are capable of being translated into minimum distances between the turbines and receptor locations. Given the precision in ETSU-R-97 it is not surprising that much of the debate at the inquiry was concerned with the accuracy of the background noise data at receptor sites; the correlation between this and the noise generated at critical wind speeds; the propagation of turbine noise; the variations between different turbine models; the effects of differences in wind shear and wind direction; and the inherent uncertainties in all such measures and assessments.
77. In order to consider these matters in the context identified in the report, I have considered the purposes of the different limits. Various reasons are identified. The 35 dB(A) simplified limit is described as being sufficient for the 'protection of amenity'. The increased fixed limit with financial involvement is described as being derived from 'the level of disturbance and annoyance caused by a noise source'. The origin of the day-time and night-time lower limits are however more precise. Both refer to sleep disturbance criteria, and the latter cites the 35 dB(A) limit included in paragraph 5 of Annex 2 of PPG24. This in turn is derived from the World Health Organisation (WHO) guideline designed to 'preserve the restorative process of sleep'¹². To my mind the different criteria imply different thresholds. The need to avoid sleep disturbance is a significantly more demanding and compelling criterion than the mere evasion of disturbance or the protection of amenity, and the use of a limit derived from the WHO inevitably suggests that a breach might legitimately be regarded as a threat to health. My attention has been drawn to more recent WHO publications. The *Guidelines for Community Noise* was published in 1999¹³. It recommends a limit of 30 dB(A) $L_{eq, 8h}$ for continuous noise in bedrooms – which equates to about 28 dB(A) L_{A90} .

¹² Environmental Health Criteria 12 – Noise. World Health Organisation, 1980.

¹³ CD64

78. Uncertainty over the variously expressed purposes of the limits is aggravated by the WHO's most recent advice – *Night Noise Guidelines for Europe*¹⁴. This recognises the variations which exist in relation to the health effects observed in the population to different levels of night noise, and refers to the needs of vulnerable groups such as children, the chronically ill and the elderly. It concludes that the population should not be exposed to night noise levels of greater than 40 dB $L_{\text{night, outside}}$ during the part of the night when most people are in bed. This, of course, is less than the 43 dB(A) night-time lower limit referred to in ETSU-R-97, and it serves to emphasise the critical importance of the limits. As the appellant observes, this limit would equate to 38 dB(A) L_{A90} and I acknowledge that it is based on a whole year of nights. Although I accept the wind would not be blowing in the same direction for a whole year, it is evident nevertheless that the wind can blow in the same direction for long periods.
79. I mention in passing that the noise levels to which I have referred in PPG24 are identified in relation to the boundary between noise exposure categories (NEC) A and B. The NECs are designed to assess proposals for residential development close to noise sources. Paragraph 8 of PPG24 records that the NEC procedure cannot be used in the reverse context for proposals which would introduce new noise sources into areas of existing residential development. According to Annex 1 this is because in general, developers are under no statutory obligation to offer noise protection measures to existing dwellings which will be affected by a proposed new noise source.
80. I have referred to these matters to both provide a context for the ensuing considerations, and to record my sympathy with the view that a review of ETSU-R-97 is overdue. Nevertheless, I recognise and acknowledge its significance in the context of the current case.
81. Other than participating in the discussion of draft conditions the council did not offer any evidence in relation to possible noise disturbance at the inquiry. Evidence was submitted primarily by the appellant and DBJRG. The parties did seek to produce a Statement of Common Ground in respect of noise matters¹⁵, but I fear much of this document records the extent of their disagreement. In this decision I have sought to consider and take account of what I regard as being the most critical differences.

Background surveys

82. The Companion Guide to PPS22 records¹⁶ that noise levels from turbines are generally low and, under most operating conditions, it is likely that turbine noise would be completely masked by wind-generated background noise. A link is thereby established between the noise generated by the turbines at varying wind speeds and the noise experienced by nearby receptors who, it is assumed, will be experiencing corresponding meteorological circumstances – at least as far as wind is concerned. The existing (pre-development) noise environment at potential receptor sites therefore needs to be established. Chapter 7 of ETSU-R-97 provides detailed guidance about the practices to be adopted. The ES and SEI record the 6 locations where background surveys

¹⁴ Document 44

¹⁵ Document 40

¹⁶ Page 167

were conducted. These were at: Broadnymett, Coxmoor and Ham Farm – to the north-east, east, and south-east of the appeal site respectively; and at Itton Manor, Halse Farm and Crooke Burnell – to the south-west, west and north-west.

83. Five of the 6 survey locations are the closest dwellings to the appeal site in the relevant directions recorded. To the south-west Lower Itton is marginally closer than Itton Manor, but I make no issue of that. In my view the dwellings are sufficiently close for the survey results to be representative. The survey locations are selected on the basis that if the predicted turbine noise falls below the limits included in ETSU-R-97, all other dwellings in the relevant direction in the area will also be below the limits. The DBJRG is critical not so much of the locations but of the precise sites, and of the manner in which the surveys were conducted. I visited all 6 sites on a moderately windy day.
84. ETSU-R-97 indicates that background noise measurements should be made in the garden or other area used for rest and relaxation, but, in order to avoid reflected noise, the site should not be closer than 3.5m from the façade of a building. I saw on my visit to Crooke Burnell that the site favoured by DBJRG would have been closer to the house, but at both sites the dominant noise was of the wind blowing through trees and pampas grass.
85. At Halse Farm the site lay within the front garden of the house. DBJRG is concerned that leaves left on the ground may have artificially increased the recorded background noise level. On the day of my visit there was significant noise from the wind blowing through the trees surrounding the garden, but the leaves at ground level were not moving. They were effectively held in place by the grass and I could detect no noise derived from that potential source. In contrast, fallen leaves at the side of the house on a tarmac surface were both moving and generating noise. However, to my mind this did not constitute a potential external amenity space, and I agree with the appellant that the site was appropriately selected.
86. At Itton Manor the recordings were taken in the garden of the house where an external table and chairs indicated an area used for rest and relaxation. I have no reason to doubt the appellant's assurance that the pond pump located in the garden was not working at the time of the survey, and I saw that the adjacent road was very lightly trafficked. Most of the noise was being generated by the wind blowing through trees and hedges, and I noted that the garden of Lower Itton was similarly sized and had a similar relationship with the adjoining house.
87. I agree with the appellant that there is no readily apparent external amenity area at Ham Farm. Potential sites close to the farmhouse were either too close to buildings or self-evidently not amenity spaces – including the site suggested by DBJRG. The site used in the survey is indeed close to a small generator building, but its noise was removed from the record. Again, the dominant noise during my visit was that generated by the wind blowing through trees and hedges close to the buildings.
88. There are a number of potential external amenity locations at Broadnymett. I considered the alternative site suggested by DBJRG. It was indeed closer to the house, but I could detect no apparent difference between that and the site

of the recordings. I acknowledge that a site closer to the building may experience lower wind speeds, but it may also be subject to greater reflections. The dominant noise source during my visit was again that generated by the wind in the many surrounding trees.

89. I am more sympathetic to the views expressed by DBJRG in relation to the selection of a site at Coxmoor. Although I do not describe the site as being in the middle of a field, it was certainly some distance from the house and its adjoining neighbouring property, and it did not have the appearance or character of a domestic curtilage. There are more appropriate areas for external rest and relaxation in the extensive but domesticated garden to the south and south-west of the house. Although these locations were more sheltered than the site actually chosen, I am far from convinced that background noise levels would be lower as suggested by DBJRG. The sites closer to the houses were surrounded by trees, and, on the contrary, I would anticipate that wind generated noise would be rather greater. During my visit however I noted that at all the locations the dominant noise was the wind in the trees.

Rain distortion

90. Under the heading of the 'analysis and derivation of background noise levels', ETSU-R-97 discusses¹⁷ the effects on the noise environment of receptor dwellings of both weather conditions not associated with wind speed and other sources of noise. It is considered in particular that rain results in a distortion of the background environment, and it is suggested that recordings made during periods of rain should be removed from the data. The DBJRG contends that this can only be reliably achieved when a rain gauge is located at the same site as the microphone. I acknowledge that this would increase the reliability of the circumstances when there is a need to remove rain-induced noise recordings. I also agree with DBJRG that some rain events can be very localised. However, in my experience such events are more likely to be associated with significant increases in wind speed. The appellant has used rainfall records from the met station at North Wyke to remove data which may be affected by rainfall, and it is less likely that rain falling over more extensive areas would be associated with localised high winds. I conclude that an appropriate correlation exercise has been executed in accordance with the purpose of the guidance included in ETSU-R-97.
91. At the inquiry DBJRG also referred to other typical background noises mentioned in ETSU-R-97. In my view it is not entirely clear whether it was the intention of the authors that such noises – work in fields, milking equipment and milk chillers, traffic and aircraft noise – should or should not be included. The position is clearer for the night-time; the noise of traffic and owls should be included as part of the noise environment of the dwelling concerned. In general I favour the appellant's view that, even in countryside locations like the appeal site, the artificial circumscription of background surveys would result in a misleading record of the rural environment.

¹⁷ Page 86

Equipment

92. I have considered the criticisms made by DBJRG in relation to the design of the microphone and its wind shield; together with the exclusion of under-range and over-range data. While I recognise that the design and capacity of the recording equipment could obviously have an effect on the background levels recorded, and that this results in part from the approach adopted by ETSU-R-97, in my view it is neither desirable nor necessary to pursue the scientific levels of accuracy which the criticism implies. I have no reason to doubt the appellant's observation that equipment capable of measuring below the levels within the capacity of the more robust external equipment is essentially confined to laboratory conditions. It was suggested in the inquiry on behalf of DBJRG that acoustics is not an exact science, and I do not believe it is desirable to exaggerate the degree of precision necessary.

Wind shear

93. Having heard and considered the evidence submitted by the parties I am generally confident about the adequacy of the background noise survey in relation to the approach included in ETSU-R-97. Notwithstanding their differences, the parties did agree that ETSU-R-97 does not adequately confront the issue of wind shear. This is considered to be at least in part a result of the significantly increased height of modern commercial turbines compared with those which were used at the time of publication. Wind shear is defined in ETSU-R-97¹⁸ as a description of the increase in wind speed with height above ground level, and it is self-evident that there will be a potentially greater difference between ground level and a hub height of 30m and ground level and a hub height of 75m.
94. ETSU-R-97 indicates that wind shear can be calculated from a formula where the only variables are height, wind speed and ground roughness. As the appellant records, it is now acknowledged that the formula fails to take account of the effect of atmospheric stability. During the day-time the heating of the surface by the sun causes the air to be buoyant. This modifies the frictional force on the airflow. At night, as the surface cools the air become negatively buoyant, and the frictional force is modified in the opposite way. During the day the atmosphere is generally unstable, but at night it becomes stable. When buoyancy is not acting in either direction, the atmosphere is neutral. The shear is larger in stable conditions and smaller in unstable conditions.
95. When atmospheric conditions become extremely stable – for example, on a clear night with low wind speeds – the maximum wind speed can occur at a certain height with lower speeds at both greater and lesser altitudes. This is known as a nocturnal jet. The frequency of nocturnal jets below 100m above ground level in the UK is not known, but I understand they are not considered to be a regular feature of the boundary layers where clouds are present. Evidence submitted on behalf of the appellant indicates that there is a complex relationship between atmospheric stability, roughness and wind direction. In this case for example, it is thought that isolated patches of woodland to the north-west and south-east of the appeal site could constitute sufficient roughness to lead to increased shear in the downstream wind profile.

¹⁸ Page 120

96. ETSU-R-97 discusses¹⁹ the effects of variations in topography on wind speed and noise experienced at receptor locations. It appears the increasing height of modern turbines renders the effect of variations in atmospheric stability on wind shear of equal importance. Wind direction can also have an important effect in relation to both the wind profile and the more readily apparent effect on downwind propagation. To my mind all these factors serve to illustrate the complexity of the subject – especially taking account of the continual and substantial variations in wind speed and direction which are such a notable feature of the weather in the UK. The characteristics of two such capricious phenomena as wind and noise, and the effect of the former on the latter, must make predictions at receptor locations inherently uncertain. Indeed, paragraph 5.4 of the Statement of Common Ground (Noise)²⁰ records that the parties agree there is no single mathematical expression which will hold true at all times to describe the vertical wind profile. I think the circumstances serve to emphasise the necessity, at the least, for the imposition of robust and adequate noise conditions. By referring to conditions I do not mean to undermine the attempt to forecast turbine noise as it would be experienced at receptor locations, but I do believe it must be an exercise fraught with difficulty and uncertainty.
97. Partly in response to the realisation that stability induced wind shear was not taken into account by ETSU-R-97, the appellant's acoustic advisors have altered the manner in which they seek to predict the noise generated and propagated by turbines. They have departed from the guidance included in ETSU-R-97. My attention was drawn by DBJRG at the inquiry to many locations within ETSU-R-97 which refer to the correlation of measured background noise levels with wind speeds up to 12m/s measured on the site of the proposed development at a height of 10m above ground level. As I understand it the justification for the correlation to the 10m high site wind speed was adopted because this was the height of readily available portable anemometer masts²¹, and because this is the reference height used by turbine manufacturers.
98. Although I agree with DBJRG that 10m above ground level is the height frequently cited in ETSU-R-97, I see no overriding reason why the necessary correlation should not be made with the wind speed at the actual proposed hub height of the turbines. I recognise that omitting the correlation with the 10m reference height amounts to a departure from the methodology adopted by ETSU-R-97, but in many other respects DBJRG is critical of the document. In any event, although ETSU-R-97 enjoys the status afforded it by PPS22 and subsequent Government endorsements, I see no reason why alternative improved or otherwise adequate methodologies should not be utilised. There is no useful purpose to be served by slavishly following guidance if more robust processes are available and reliable. In my view the 10m reference height is simply a means to an end – the end in this case being to relate the background noise measurements to the wind speed and hence the noise generated by the turbines. I cannot see that the method adopted by the appellant undermines this principle.

¹⁹ Pages 47-49

²⁰ Document 40

²¹ ETSU-R-97 page 85

Propagation

99. There is agreement between the parties that an example of a relevant area not covered by ETSU-R-97 is that concerned with the propagation of sound outdoors. In this case the appellant has used one of the International Standards series – ISO 9613-2 (Part 2: General method of calculation)²². Its purpose is to enable noise levels in the community to be predicted from sources of known sound emission.

100. The DBJRG have drawn my attention to its limitations. In particular it is claimed the use of the ISO is inappropriate where there is both wind *and* a temperature inversion; it is limited to conditions where the wind is between 1 and 5m/s measured between a height of 3 and 11m; and the method of calculating the ground effect is applicable only where the ground is approximately flat – either horizontally or with a constant slope. The document also identifies an uncertainty of +/- 3 dB over distances between 100 and 1000m. I acknowledge the existence of these limitations in relation to the use of the ISO, but it on the basis of this propagation model that the appellant predicts the turbine generated noise at the 6 receptor sites would, with one exception, be within the criteria derived from ETSU-R-97.

101. The predicted margins are as follows:

- at Halse Farm the downwind turbine noise would be below the night-time limit by at least 8.5 dB, and below the day-time limit by at least 7 dB;
- at Lower Itton the equivalent margins are 5 dB and 1 dB;
- at Ham Farm the equivalent margins are 5.5 dB and 0.5 dB;
- at Broadnymett the equivalent margins are 8 dB and 4 dB;
- at Coxmoor the equivalent margins are 9.5 dB and 6.5 dB;
- the exception is Crooke Burnell. Here the equivalent night-time margin is 6.5 dB, but the downwind predicted noise *exceeds* the day-time limit by a maximum of 1 dB. However, the predicted noise would fall below the 40 dB L_{A90} limit referred to in ETSU-R-97²³. The house is also occupied by a financially involved participant where ETSU-R-97 indicates an even higher lower limit of 45 dB(A)²⁴.

102. In response to the DBJRGs criticisms, the appellant has cited a paper given at the Third International Meeting on Wind Turbine Noise in Denmark in June 2009 – Wind Farm Noise Predictions and Comparisons with Measurements²⁵. This is said to confirm the predictions derived from the propagation model. Be that as it may, much rests on the comparisons between the sites considered in the paper and the current appeal site.

²² CD68

²³ Page 63

²⁴ Page 66

²⁵ CD155

103. Three sites were considered, but I agree with the DBJRG that they all appear to be at odds with the current appeal site. Site A is described as being located on a relatively high plateau characterised by moderately undulating terrain and minimal vegetation – a mixture of grassland and peat bog. The land was effectively frozen during the survey. Site B is located on flat terrain with minimal vegetation. It too is surrounded by peat bog and was water logged during the survey. Site C is lightly undulating but effectively flat in acoustic terms. There is minimal vegetation but with large areas of forestry further away. At Site A, a 110° arc of downwind propagation was used, but ISO 9613-2 specifies a maximum angle of +/-45°. At Sites B and C, two datasets were produced using 30° and 90° arcs, but at all sites the study focussed on the periods in which all the two speed turbines were generating in the high speed mode²⁶. It is only at Site C that a ground factor of G=0.5 was used – as with the current appeal case – and the graphs indicate that the measured noise levels are generally higher than the predicted levels. Finally, I note in the conclusions to the paper that further study is considered to be desirable, including in more complex terrain profiles and using variable speed machines. In my view the three sites studied certainly appear to be radically different from the land in the immediate vicinity of and surrounding the current appeal site. For the reasons expressed by the DBJRG I have attributed little weight to the paper, and I am concerned that the propagation model appears to have been used outside the terms of its limitations.
104. The utility and accuracy of the propagation model is further complicated by doubts over the identity of the actual machine which would be used. For understandable commercial reasons the prospective developer is reluctant to specify a particular manufacturer or model other than as a candidate. There are a number of turbine manufacturers producing machines of similar dimensions and appearance, but exhibiting differing sound power characteristics.
105. Both the appellant and DBJRG have provided evidence of the different sound power levels emitted by the candidate machine – a 2MW Vestas V90 – and others. There are evident differences between the machines. The information provided by the parties indicates a difference at cut-in speed (4m/s) of about 4 dB. With a wind speed of between 8 and 12m/s DBJRG's figures show a difference of 1.5 dB (on the basis of 4 machines), while the appellant shows a difference of about 1 dB at 12 m/s (on the basis of 3 machines). It is in this context that the DBJRG has referred to the significance of the compatibility of the application for planning permission and the ES in *R v. Rochdale MDC* [2000]²⁷. I acknowledge that the differences between machines constitutes an additional element of uncertainty, but I do not believe it would be sufficient to undermine any permission granted. Similarly, I understand wear and tear, particularly of the blades, would also have an effect, together with variations implicit in the warranty of machines. It would however endow any conditions designed to regulate noise at receptor sites all the more important.
106. As is recorded in paragraph 2 of DoE Circular 11/95 : *The Use of Conditions in Planning Permissions*, the power to impose conditions when granting planning permission is very wide. Amongst other matters however, conditions

²⁶ The candidate turbine in the current appeal is a variable speed machine.

²⁷ Document 36

should only be imposed where they are necessary. The appellant observes that the candidate turbine is capable of meeting the noise limits specified in ETSU-R-97, but simultaneously records that it is prepared to accept planning conditions to the same effect. Largely as a result of the complexities involved, the draft conditions are painstakingly elaborate, but in my view their acknowledged necessity by the appellant does not inspire confidence. I recognise however that conditions to regulate noise at receptor locations derive, at least in part, from the uncertainties to which I have referred and the need to secure compatibility between the planning application, any planning permission and the ES for the scheme. I consider the draft conditions later in this decision.

Day-time lower limit

107. I have already referred to the threshold as advised in ETSU-R-97 for the day-time lower limit – it lies within the range of 35-40 dB(A). Although in comparison with day-time the desirability of more stringent limits at night-time is generally acknowledged – in PPG24 for example, ETSU-R-97 adopts the rather surprising approach that external day-time noise limits should lie somewhere between that required to forestall sleep disturbance *outside* the adjacent noise-sensitive building (ie 35 dB(A)), and the higher level that would still avoid sleep disturbance *inside* (ie 43 dB(A)).
108. The actual value chosen should depend on three considerations: the number of dwellings in the neighbourhood of the wind farm; the effect of noise limits on the kWh generated; and the duration and level of exposure. Both night-time and day-time lower limits are therefore both sleep-related, and closer to each other than the limits included in PPG24. One effect of the structure of the limits is that, subject to the upper limit (of 5 dB above background) and notwithstanding the ability to regulate noise emissions by reducing the rotational speed of the blades, compliance with the day-time lower limit should ensure that the night-time lower limit would be comfortably met. In this case a value of 37.5 dB(A) was agreed with the council²⁸.
109. The purpose of the variable day-time lower limit is to allow some flexibility to take account of the numbers of dwellings in the vicinity; the proportion of time background noise levels were very low; and the effect of limitations on the power generated. In accordance with the implications of these considerations, it appears the design of the proposed wind farm has been driven by the ETSU-R-97 noise limits on one hand and the maximisation of power generation on the other. I agree with DBJRG that the adoption of 37.5 dB as the day-time lower limit appears not to have been the subject of detailed assessment. The level was agreed between the appellant and the council early in the process, and the rationale for the adoption of this level is unclear to me.
110. What is evident however is that the effect of the three factors is to render rural locations with low population densities but higher background noise levels the most attractive destinations for wind energy schemes. Based on the appellant's data, DBJRG has assessed that Ham Farm and Crooke Burnell have background noise levels below 30 dB for 44% of time. The comparable

²⁸ Although she uses a different day-time lower limit and ground hardness assumption, the principle is usefully (and clearly) illustrated in Dr Hoare's Figures 5, 6 and 7. However, I see no reason to dispute the ground hardness assumption adopted by the appellant.

proportions for Lower Itton, Broadnymett and Coxmoor are 25%, 21% and 16% respectively.

111. On the basis of their duration and the level of exposure, DBJRG suggests the day-time lower limit should be set at 35 dB. I agree that these are relatively long periods, but I note the comment in ETSU-R-97 that the approach is difficult to formulate precisely and a degree of judgement should be exercised. I saw on my visits that there are only a limited number of dwellings in the vicinity of the appeal site. On the basis of these considerations, and notwithstanding the low background noise levels, I raise no objection to the adoption of 37.5 dB as the day-time lower limit.

Amplitude modulation

112. Evidence was submitted at the inquiry by the residents of dwellings close to existing wind farms. Particular reference was made to the adverse effect of amplitude modulation (AM) – the modulation of aerodynamic noise at blade passing frequency. Under the heading of ‘penalties for the character of the noise’ in ETSU-R-97²⁹ the phenomenon is described as blade swish, and it records that it has been considered by some to have a characteristic that is irregular enough to attract attention. The noise levels recommended in the report take account of the phenomenon, but it is acknowledged that further research may be required to enable proper measurements and assessments to be made.
113. According to the appellant, the precise causes of high levels of modulation are not clearly understood, but five possible contributory factors are identified. They are: close separation distances between turbines in a line where such a line points towards noise-sensitive buildings; unusual topography; the ratio of blade length to tower height; high levels of wind shear; and specific turbine types.
114. DBJRG also refers to very stable atmospheric conditions as a possible contributory factor. ETSU-R-97 records that the modulation in blade noise can result in a variation in the overall noise level by up to 3 dB(A) close to the turbine. Receptor locations close to reflective surfaces may result in an increase in the modulation depth by as much as +/- 6 dB(A). It is reported on behalf of DBJRG that such greater modulations can occur at distances in excess of 900m from the closest relevant turbine. In some cases the noise experienced can possess intrusive impulse characteristics.
115. One of the potential contributory factors referred to by both parties is the proximity of turbines. The same matter was referred to in evidence submitted on behalf of CPRE. In its section on the technology of wind turbines the Companion Guide to PPS22 provides an example of turbine spacing of around 6 times the rotor diameter (540m) where the machines are in line with the prevailing wind direction, and the General Specification of the Vestas V90³⁰ itself specifies a distance of 5 rotor diameters (450m). In contrast, the appellant observes that a typical minimum is 3 rotor diameters. In this case the layout of the proposed wind farm is such that the majority of the turbines would be aligned in two lines on a south-west/north-east orientation, with T2,

²⁹ Page 68

³⁰ CD150, paragraph 1.4

T7, T4 and T5 forming a northern group and T1, T8 and T6 forming a southern group. The average separation distance of turbines within each group would be 377m and 452m respectively. The possibility of energy loss through wind shadowing by upstream machines referred to in the Companion Guide is essentially a matter of the prospective developer, but the layout would appear to lend itself to the possibility of high levels of downstream turbulence.

116. Because of concern about the presence and impact of AM the Government commissioned research into the matter from the University of Salford³¹. The research essentially takes the form of a survey of local authorities with wind farms in their areas. The survey indicated that 27 out of the 133 wind farms operational at the time had received formal complaints about noise at some point in their history. Only in 4 cases however was AM considered to be a factor, although it was a possibility in another 8 cases. DBJRG has expressed misgivings about the survey and the interpretation of its results, but the study also includes a discussion of the possible causes of greater than expected AM. Amongst other matters the report records that sound generation by turbulence is still not completely understood, and there are no existing models by which it can be predicted. In some situations AM noise seems to travel a considerable distance from the turbines, but further studies are needed to explain and predict the observed noise levels. Topographical effects may also result in turbines being 'unsure' about the direction of the wind, or the wind may be blowing in different directions at different heights. The report concludes that the incidence of AM and the numbers of people affected are too small to make a compelling case for further research. On the other hand such research would be prudent to improve understanding.
117. In its consideration of the report the Government concluded³² there was not a compelling case for more work into AM at the time (2007), however the matter would be kept under review. In its observations on AM the appellant records that recent examples of high levels have been at sites incorporating Repower MM82 turbines. Although it is said that this make of turbine is not proposed for the current site, as I understand the position, no commitments have been made either for or against any specific make or model. On the basis of the evidence I have received I conclude that the possibility of a greater than expected impact from AM would be possible. In circumstances where the result of unforeseen consequences is sleep disturbance, I am in no doubt that, in the event of the appeal succeeding, a condition to regulate the phenomenon is both necessary and reasonable. I discuss this matter later in this decision.

Conclusion on Noise

118. The parties are effectively in agreement that the utility of ETSU-R-97 is questionable in some respects, and I have also been quite critical in a number of respects. This is perhaps inevitable when the processing of the application and the appeal has taken such a long time. Both the manner in which the advice is applied and the basis of the methodology have changed since the application was submitted, and I agree with DBJRG that there are some notable uncertainties inherent in the process. Notwithstanding the endorsement which the report enjoys through its citation in paragraph 22 of PPS22, I believe it

³¹ CD103

³² CD109

would be misguided not to amend and refine the procedure it adopts when this will improve the value of the exercise. In my view, this is what the appellant has sought to do without losing sight of the essential purposes of the document.

119. It is important in this context to record that its purpose is two-fold. It seeks to protect the living conditions of residents who would be near wind turbines, but it also aims to avoid placing unreasonable restrictions on wind energy development. It does not set out, for example, to render wind turbines inaudible at nearby dwellings. I have considered the matters raised by DBJRG and others in the light of the contents, purposes and general principles of ETSU-R-97, as improved in current practice.
120. In my view the appellant has carried out a detailed and comprehensive assessment of the noise environment in the vicinity of the appeal site. An assessment has also been made of the impact the proposed wind farm would have on the locality. No doubt more exhaustive surveys and assessments could have been undertaken over more extended time periods and meteorological conditions, and a number of the uncertainties identified by DBJRG could be reduced. I fear however that the application of the practice of acoustics to the noise generated by wind turbines is such that they could never be entirely extinguished, and in this case some of the day-time margins – especially at Ham Farm and Lower Itton – are very small.
121. It is in the light of these inherent uncertainties that I conclude the living conditions of local residents would not be unreasonably affected provided the necessary and appropriately worded conditions were imposed. If the appellant's predictions are correct there would be no need for the conditions to be enforced, but it is important that the council is able to take the necessary action if it became expedient to do so. In my view the uncertainties which have been identified serve to accentuate the necessity for the imposition of conditions on any permission granted. I conclude on this basis the proposed development would not conflict with the provisos included in both structure plan Policies CO12 and CO16 and local plan Policies PS10 and BE18.
122. The possibility was raised at the inquiry that I should consider whether the scheme gave rise to a likely violation under Articles 3 and 8 of the European Convention on Human Rights. Article 3 is the prohibition of torture, and Article 8 is the right to respect for private and family life. The matter is raised in the context the possibility of sleep deprivation. I recognise that allowing the appeal would inevitably result in some interference at the homes of residents in the surrounding area. I do not believe the turbines would be inaudible. However, this consideration must be balanced against the rights and freedoms of others, and I am satisfied that if the development, subject to conditions, goes ahead, its effect would not be disproportionate.

Other Matters

123. A number of additional matters have been raised during the processing of this case which in my view do not constitute main issues. These include the potential impact of the proposal on tourism, health, safety and agriculture.

Tourism

124. Although the effect of the proposed development on the potential of the locality as a tourist destination was considered at the previous inquiry, Visit Devon – a non-profit making, public-private partnership – was not formed until 2008. It fully supports the need for renewable energy projects in the South West, but it is particularly concerned about the number, size and scale of the turbines in an otherwise undeveloped area so close to the Dartmoor National Park. My attention has been drawn in particular to two tourism based businesses at Staddon Farm and Nichols Nymet House.
125. Both properties lie on the south facing slope of the ridge between North Tawton and Bow. The appeal site lies to the south of both at a distance of about 2kms. Staddon Farm is the base for the organisation and sale of horse-riding holidays – usually at destinations abroad. I understand there was a prospect that similar holidays could have been instigated locally, taking advantage of the proximity of the land to Dartmoor. However, the prospect of the proposed development has resulted in a decision being postponed.
126. Nichols Nymet House includes a bed and breakfast business with three holiday cottages in a converted stable block. One of the most important aspects of the destination is its peace and tranquillity – characteristics which it is feared it would be impossible to identify in the event of the development proceeding.
127. There can be no dispute that the operation of the proposed wind farm would be evident from both properties, from their immediate surroundings, and from the surrounding roads, bridleways and footpaths – making an allowance for the additional height of those on horse-back. I recognise the development would significantly affect the way in which the area is seen and perceived by those on holiday, but I am unconvinced that it would result in serious harm to actual or potential businesses. Notwithstanding their visibility, I believe it would be to exaggerate their influence to suggest that they could also undermine or compromise the viability of otherwise successful business enterprises. Although the visual effects would be felt in a relatively wide area, the change to the character of the landscape would be comparatively localised. On this basis I do not believe the proposed development would be a threat to local tourism.

Health

128. A number of local residents and others have expressed concern about the possible health impacts of the proposed turbines. However, many of these concerns are based on the possible consequences of sleep deprivation and/or the purported emission of low frequency noise from the turbines. I have referred to the first of these matters in a preceding section of this decision. I again acknowledge that the possibility of sleep disturbance – given especial prominence by the criteria adopted in ETSU-R-97 – would indeed be a serious consequence, albeit one confined to a limited number of noise-sensitive properties. As far as low frequency noise is concerned however, the Companion Guide to PPS22 records that there is no evidence that ground transmitted low frequency noise from wind turbines is at a sufficient level to be harmful to human health.

129. A number of representations have been made in relation to the possible effects of shadow flicker and reflected light. It is recognised that in some circumstances the former can trigger an epileptic reaction, and both can be irritating. However, the Companion Guide to PPS22 records that the phenomenon should not apply to the slower moving new generation of turbines, and in any event the Statement of Common Ground includes a draft condition designed to overcome the problem. It is not possible to entirely eliminate reflected light, but there is no indication that it might be the cause of a similar reaction.

Safety

130. Evidence submitted on behalf of CPRE refers to the potential for wind turbines to present a source of high risk to the public. Possible causes refer to blade failure, fire, structural failure, ice and lightning strikes. Others have referred to the possibility of driver distraction and the inadequacy of the local roads to accommodate large delivery vehicles. The latter matters are also addressed by the Companion Guide to PPS22. I acknowledge that the implementation of the scheme would necessitate some minor road alterations. These are essentially matters between the appellant and the local highway authority. As far as the possible distraction of drivers is concerned, I saw on my visits that the local network does not carry substantial volumes of traffic and the turbines would be set well back from roads and junctions. I see no objection to the project on these grounds.

131. I acknowledge that the EIA Regulations refer to the risk of accidents in the selection criteria for the screening of Schedule 2 development, but in my view the ES is not deficient in its consideration of the safety implications of the development or the associated risk assessment. Modern wind turbines are undeniably large structures, and, as with any man-made machine, they can be subject to failure from time to time.

132. However, both the ES and the Companion Guide to PPS22 record that properly designed and maintained wind turbines are a safe technology. I have no reason to doubt that the turbines would be certified to withstand extreme conditions. The technology itself is fairly simple, and this in itself must reduce the risk of accidents. I understand the turbines will include lightning conductors, and the possibility of the icing of the blades would result in the turbine being shut-down.

133. The Companion Guide to PPS22 records that maximum safety can be achieved by ensuring the turbines are set-back from roads and railways by at least fall over distance. I understand however that two of the proposed turbines (T6 and T8) would be within 100m and 90m respectively of the railway line which crosses the appeal site. However, in my view the likelihood of a collapse is extremely remote.

Agriculture

134. Representations were made at the inquiry to the effect that the proposal had had a divisive effect on the agricultural community. The earthmoving operations necessary to construct the wind farm would also adversely affect the hydrology of the land and possibly sterilise large areas. The scheme would not be as reversible as the appellant suggests.

135. I do not dispute that wind energy schemes can have a divisive effect on communities where substantial or rapid change has not been characteristic of the recent past. However, in this respect such proposals do not differ from other schemes where one area of land is favoured over another. It is a matter which in my view falls outside the remit of the planning mechanism.
136. In relation to the second matter, the ES includes a hydrological assessment of the scheme. Attention is drawn to the different hydrological regimes in the areas of the site which drain into the Den Brook and into the unnamed stream to the south. I understand that in part this is due to different soil types. Amongst other matters the turbines positions have been identified in order to avoid watercourses, but the ES recognises the likely need for drainage and treatment. I have no reason to suppose that best practice would not be applied to the excavation of foundations or the other operations involved, and I agree with the view expressed in the ES that the hydrological effect of the scheme would be minimal.

Conclusion on the first main issue

137. I therefore conclude in relation to the first main issue that the project would be a cause of some harm in terms of its visual effect on the landscape – especially from some vantage points to the north and north-east of the site. The scheme would also result in a significant change to the landscape character of the surrounding area. I found there would be no harm however in relation to the historic environment or with respect to local ecology. In relation to possible noise interference, I am concerned that this is a matter where there are significant uncertainties surrounding the generation and propagation of wind turbine noise. In contrast, I am reasonably confident about the background noise surveys. In my view these conclusions can only accentuate the importance and necessity of appropriately worded conditions to any permission granted in order to secure compliance with the limits included in ETSU-R-97. I have found no harm resulting from the other matters raised.

Renewable Energy Policy

138. I turn now to the second main issue, under the terms of which it is necessary to consider the position of the scheme in relation to the range of policies which specifically refer to the generation and supply of energy from renewable resources. A number of the key principles included in paragraph 1 of PPS22 are relevant. Sub-paragraph (ii) records that regional spatial strategies and local development documents should contain policies designed to promote and encourage, rather than restrict, the development of renewable energy resources. Sub-paragraph (iv) indicates that the wider environmental benefits of proposals for renewable energy projects, whatever their scale, should be given significant weight in the determination of planning applications. Similarly, sub-paragraph (vi) recognises that small-scale projects can provide a valuable contribution to the overall outputs of renewable energy, and applications should not therefore be refused simply because the level of output would be small.
139. The thrust in favour of the adoption and growth of renewable energy is reiterated in numerous international and national statements and policies – largely in response to concerns about climate change and its effects. Most

latterly, paragraph 11 of the Supplement to PPS1: *Planning and Climate Change* (2007) records that authorities should have regard to the contents of the Supplement as a material consideration which may supersede the policies of the development plan. *The UK Renewable Energy Strategy*³³ (2009) refers to the legally-binding target to ensure that 15% of our energy comes from renewable sources by 2020. The strategy's lead scenario is that more than 30% of our electricity should be generated from renewables by 2020 – up from about 5.5% today. I acknowledge nevertheless that notwithstanding the new imperative, the need for a balance to be struck between the requirement for sites and their local impact remains central to decision making. I note also the council's point that the strategy does not seek to establish sectoral or technology targets. On the contrary, the Government has sought to introduce a raft of measures including a reduction in demand and use, and the securing of diverse and secure energy supplies. The development of onshore wind energy remains but one part of a wide range of measures.

140. The most directly relevant policy included in RPG 10 (2001) is Policy RE 6 (Energy Generation and Use). Amongst other matters, it encourages a minimum of 11-15% of electricity production to be from renewable energy sources by 2010; it has full regard for the recommendations and background information included in the *Renewable Energy Assessments and Targets for the South West* (2001)³⁴; and it also records that development plans should specify the criteria against which renewable energy projects will be assessed, balancing the benefits of developing more sustainable forms of energy against the environmental impacts, in particular on national and international designated sites.
141. The draft revised RSS including the Secretary of State's proposed changes was issued in 2008. Policy RE1 includes renewable energy targets for 2010 and 2020. The 2010 minimum target is 509-611 MW installed onshore capacity, of which about 151 MW would be in Devon. The equivalent regional cumulative target for 2020 is 850 MW. Policy RE4 (Meeting the targets through development of new resources) records that in considering individual applications, local planning authorities will take account of the wider environmental, community and economic benefits of proposals, whatever their scale. They should also be mindful that schemes should not have cumulative negative impacts, and proposals in protected areas should be of an appropriate scale and not compromise the objectives of designation. The draft strategy has now reached an advanced stage and its contents therefore enjoy significant weight.
142. Policy CO12 is the most directly relevant policy of the *Devon Structure Plan 2001 to 2016* (2004). It repeats the sub-regional target of 151 MW by 2010, but, as I have already reported, it renders schemes subject to consideration of their impact on the qualities and special features of the landscape and upon the conditions of those living and working nearby. It also identifies priority search areas in the Key Diagram. Although the appeal site does not fall within such an area this does not in my view seriously undermine the consideration which should be given to other sites.

³³ Document 35

³⁴ CD 11

143. Policy PS10 of the *West Devon Borough Local Plan Review (2005)* is similar to the equivalent policy in the structure plan. It offers support to renewable energy projects provided they have no significant adverse effects on the qualities and special features of the natural landscape or townscape, on nature conservation, or on the conditions of those living and working nearby.
144. It is therefore evident that the stance adopted in both the development plan and emerging policy is essentially supportive of the renewable energy schemes, subject to a number of provisos which I have considered in the preceding sections of this decision. At the inquiry the appellant and the council came to an agreement listing the capacity of the operational, consented and pending renewable energy schemes in Devon. This records a total installed capacity of 32.8 MW, and consented schemes of 82.75 MW. Three appeals are pending (including the current case) providing 44 MW; applications are pending providing 31.1 MW; and pre-planning discussions are underway for an additional four schemes providing 64 MW. The parties agreed that the deficit for the 2010 Devon target is therefore 118.2 MW. As far as the RSS targets are concerned, the installed capacity is now 154.84 MW and the deficit for the 2010 target is therefore 354-456 MW. The deficit in terms of the 2020 target is 695.16 MW.
145. Paragraphs 2-5 of PPS22 indicate the importance which is attached to the targets for increasing renewable energy capacity. Paragraph 3 states that they should be recorded as a minimum amount of installed capacity, although they may also be expressed as a percentage of electricity consumed or supplied. Progress should be monitored and targets should be revised upwards if they are met. The latter provision is however subject to the region's renewable energy resource potential, and the capacity of the environment for such development. Achievement of the target should not be used in itself as a reason for refusing planning permission for further projects, and the prospect of offshore generation should not be used as a justification for lower targets for onshore projects.
146. My attention was drawn by the council to paragraphs 14-16 of the Supplement to PPS1. These are concerned with the performance of the RSS in mitigating climate change. It is noted that strategic targets form part of the framework for planning decisions. However, they should be used as a strategic tool for shaping policy, and not applied directly to individual planning applications. It is on this basis that the council argues the strategic targets are peripheral to the consideration of the merits of the appeal proposal.
147. I have considered the applicability to this case of the performance management measures and strategic targets referred to in the Supplement to PPS1. The Supplement is concerned with the broader issue of climate change and the reduction of carbon emissions, whereas PPS22 has a significantly more focused purpose. It is concerned only with the contribution which renewable energy schemes can make to the wider environmental objective. Nevertheless, as an addition to PPS1 the Supplement has an overarching status in relation to the delivery of sustainable development. It is specifically noted that, where there is any difference in emphasis on climate change between the Supplement and the other PPS/Gs in the series, this is intentional and the Supplement takes precedence. In addition, paragraph 11 of the Supplement records that it may

supersede the policies of the development plan. The Supplement (2007) also post-dates PPS22 (2004) and its Companion Guide (2004).

148. I therefore agree with the council that the content of the Supplement appears to diminish the extent to which the deficit in relation to the renewable energy targets can have a significant bearing on this case. However, my view is tempered by the wider remit of the Supplement, and by the evident weight with which they – the renewable energy targets – are promoted in PPS22. Indeed, paragraph 3.13 of Chapter 3 of the Companion Guide specifically states that targets are important because they have to be followed through into local development frameworks and the development control process. Even within the context of the appeal, there are few who doubt or question the legitimacy of the targets in terms of either climate change or the attractions of renewable energy, and in my view, a poor performance must add some weight to the benefit of a project which would serve to decrease the size of the deficit. In this case it appears the 2010 renewable energy target for Devon will be only be about 22% achieved, and the equivalent proportion for the region will be between 25 and 30%. I recognise that with the addition of the consented schemes the Devon proportion would rise to about 77%, but evidence submitted on behalf of the appellant notes that lead-in times can be long. Even though the appeal scheme could not now make a contribution to the 2010 target, if the project was implemented with the other consented schemes, the proportion would rise to just over 88%. However, it seems inevitable therefore that the targets will not be achieved, and, though by no means determinative, I conclude this state of affairs must make its own contribution to the benefit of the project.
149. I have taken account of the council's concern that both the output of the proposed wind farm and the predicted emissions saved have been exaggerated. The council has referred to the predicted long-term mean annual capacity factor for the proposed wind farm of 25.2% - equivalent to 39.77 GWh/annum. These figures are indeed less than those included in the ES in 2005. Similarly, I accept that the savings in terms of reduced CO₂ emissions are now much reduced – from 860g/kWh to 430g/kWh. However, as the council observes, although these benefits would be notably less than those originally predicted in the ES, the targets are expressed in terms of installed capacity. Even on the basis of their recalculated levels, the scheme would still make a significant and valuable contribution. I note in this context that the Companion Guide to PPS22 reports that capacity factors in the UK generally fall anywhere between 20 and 50%, with 30% being typical.
150. The council has also drawn my attention to a challenge in 1999 to the decision in respect of an unsuccessful appeal for a wind farm in County Durham - *National Wind Power Ltd v. SSETR* [1999]³⁵. In that case the judge held that the decision-maker could take account of both the absolute and relative contributions of the scheme then under consideration – that is, the installed capacity and the anticipated actual output. It appears in the current case that a similar argument formed part of the challenge in respect of the first appeal decision. However, the point was essentially overtaken by other events before the decision was quashed. I do not dispute the point made by the council, but

³⁵ Document 56

I note that the capacity of the proposed development would fall within the national average.

151. I have considered the council's point that the appellant has failed to demonstrate the necessary regard for the location of the scheme as required in paragraph 1(viii) of PPS22. However, I have no reason to doubt that the process described in paragraphs 2.1.1 to 2.5.2 of the ES were carried out as recorded. This reports how sites were sought in the areas of West Devon, North Devon and Mid Devon west of the M5 motorway. A total of 47 potential sites were reduced to 16 for a variety of reasons. These were subject to more detailed scrutiny and subsequently reduced to 11. Of these, 6 appeared to be large enough to permit the siting of at least 5 turbines, and the site at Den Brook was the largest. In my view this process described a comprehensive procedure by which the site was identified, and I agree with the appellant that there is no requirement to pursue a sequential process.
152. I conclude in relation to the range of national and development plan policies against which renewable energy schemes fall to be considered, that the scheme would make a limited but valuable contribution to the reduction of CO₂ emissions. It thus complies with the purpose of Policy RE 6 of RPG 10 and the subsequent emerging equivalent policies of the RSS. Subject to the matters I have considered under the heading of the first main issue, it accords with the purposes of structure plan Policy CO12 and local plan Policy PS10.

Conditions

153. I turn now to consider the draft conditions which were submitted to and discussed at the inquiry. The draft conditions cited are those attached at Document 65. I have considered the conditions in the light of both the preceding parts of this decision and the contents of DoE Circular 11/95: *The Use of Conditions in Planning Permissions*. I have considered the draft noise conditions separately.
154. The standard period in which development is to be commenced is 3 years. I acknowledge however that in relation to a commercial wind energy scheme a longer time would be necessary because of the long lead-in times involved. A period of 4 years would be appropriate.
155. Draft condition 2 limits the life of the wind farm to 25 years and makes provisions for the after-care of the site. Both the council and DBJRG consider the limited removal of the concrete turbine bases would be insufficient. However, in my view the removal of concrete to a depth of 1m below ground level would be sufficient for the re-establishment of agriculture. The costs of restoration would fall to the then owner or operator of the site.
156. There was no objection to draft condition 3 concerning the removal of the temporary construction compound and two temporary meteorological masts.
157. The purpose of draft condition 4 is to secure the removal of turbines which, for any reason, stop working for a continuous period of 12 months. This is indeed a rather long period, but I have no reason to doubt the appellant's contention that lead-in times for spare parts can be significant. I have nevertheless clarified the meaning of 'operational', and, in the interests of precision, I have removed the flexibility included in the original draft.

158. There was no objection to draft condition 5 concerning the preparation of a construction method statement.
159. Draft condition 6 regulates the external finish and colour of the proposed turbines and buildings. The CPRE favoured a white finish, but both the council and the appellant would prefer a more subdued finish. Paragraph 3.2.15 of the ES specifies a pale grey colour with a semi-matt finish. In my view this would appear less stark than white, and I have specified it accordingly.
160. There was no objection to draft condition 7 concerning the direction of rotation of the proposed turbines.
161. The purpose of draft condition 8 is to allow some flexibility in the siting of turbines to take account of, for example, ground conditions. Both the council and DBJRG drew attention in this context to the effect of *R v. Rochdale MBC*, and the danger that an assessment made on the basis of submitted drawings may be undermined by an excess of flexibility. The appellant also expressed some sympathy for this view, but felt the matter could be left to the council. In my view the condition fails the test of precision included in Circular 11/95. The proposed siting of the turbines is capable of being clearly and precisely defined on the ground on the basis of the submitted drawings, and in the event of adverse ground conditions a revised application may be necessary. It follows that I consider draft condition 8 should be omitted. Departing from the 50m micro-siting flexibility included in Figure 3.1A of the ES also largely resolves the concern expressed in English Nature's Technical Information Note about the proximity of turbines to hedgerows.
162. There was no objection in principle to draft condition 9 concerning ecological mitigation and compensation measures, nor draft condition 10 concerning archaeology.
163. Draft condition 11 seeks to establish a means of regulating the possible incidence of shadow flicker. In my view a clause requiring the implementation of the scheme is both necessary and reasonable.
164. The purpose of draft condition 13 is to secure a scheme to investigate and alleviate any electro-magnetic interference with radio or television reception. There was no objection.
165. Neither the council nor the appellant were enthusiastic about a lighting scheme for the proposed turbines. However, the area is one which is subject to low altitude training and in my view a condition is both necessary and reasonable. I have constructed a condition based on draft condition 18 which in my view would have only a limited adverse effect on local amenity.
166. There was no fundamental objection to draft condition 15 concerning off-site highway works, nor draft condition 16 concerning working times and practices during the construction phase.
167. Draft condition 17 specifies the type of turbine and their maximum height.
168. The council has suggested an additional condition preventing the commencement of the proposed development unless and until a connection to the national grid is approved by the council. In the appellant's view such a condition would fail the test of relevance included in Circular 11/95. The local

electricity distribution company would in any event have to obtain approval for the route. This matter is referred to in the Companion Guide to PPS22³⁶. From the appellant's viewpoint it is self-evidently a prerequisite of the scheme for which a separate mechanism applies. I therefore see no need to add a condition which would duplicate the requirement.

Noise conditions

169. The draft conditions cited are those included in Document 66. Draft noise conditions were discussed at the inquiry, including the submissions made by DBJRG. I have considered in the first instance the draft conditions agreed between the appellant and the council.
170. In ETSU-R-97 it is suggested³⁷ that the need to regulate noise emissions from wind turbines is too complicated to be the subject of conditions imposed on a planning permission. In view of this the contents of a section 106 Agreement under the above Act are drafted together with supplementary guidance notes. However, more recently the contents of the draft Agreement have effectively been translated into a number of conditions, but including the necessary guidance notes. Notwithstanding the endorsement of ETSU-R-97 conferred by PPS22, the advice of ODPM Circular 05/05: *Planning Obligations* is that, where possible, conditions are preferable to obligations³⁸.
171. The draft conditions essentially seek to: (a) establish rating levels for noise immissions at 7 noise-sensitive dwellings; (b) specify a procedure for considering complaints about turbine noise; (c) provide for the disclosure of information; and (d) devise a scheme for the measurement of immissions in a range of different wind speeds and directions with the purpose of demonstrating compliance with the rating levels. In the event that noise immission levels are exceeded, the development will have failed to comply with (a). The council would then have the option of pursuing the matter by means of either a Breach of Condition Notice or an Enforcement Notice.
172. In relation to draft noise condition 1, DBJRG observes: that 'rating level' is not defined; that 'properties' should read 'dwellings'; that 'lawfully exist[ing]' is not defined; and that 'nearest' is not defined. 'Rating level' is defined in the Glossary to PPG24, and I raise no objection to 'dwellings' being substituted for 'properties'. I consider the meanings of 'nearest' and 'lawfully exist[ing]' are clear in both their geographical and planning senses, but I have omitted the final phrase in the interests of precision.
173. Draft noise condition 1 refers to Tables 1 and 2. These tables record the various levels at the receptor sites at different wind speeds. Table 1 refers to the night-time hours, and Table 2 to the remainder. DBJRG observes that it is neither practical nor useful to refer to fractions of decibels, but, in contrast, the wind speeds should refer to fractions. I accept the appellant's view however that the limits are specified in relation to wind speed integer levels having been derived from a polynomial curve. I raise no issue with the detail inherent in the noise limits as these too would be mathematically derived.

³⁶ Page 183, paragraph 99

³⁷ Page 91

³⁸ Paragraph B51

174. In relation to draft noise condition 2, DBJRG observes: that the council should be able to investigate noise immissions in the absence of a complaint; that the consultant's report should include all relevant data in an electronic format; and that the 28 day period is excessively rapid. I see no practical benefit in the council being able to instigate an investigation without a complaint. The data sought by DBJRG would be available under the provisions of draft noise condition 3, but I agree that 28 days could be too short a period to take account of different meteorological conditions. I have therefore increased the period to 56 days.
175. In relation to draft noise condition 3, DBJRG observes that locations for the data cited are not defined. However, the data is from each turbine so the locations would be known. In the interests of consistency I have increased the period specified to 56 days.
176. In relation to draft noise condition 4, DBJRG observes: that there is a need for a consultant to be appointed at the expense of the developer to advise the council; and that the council's satisfaction should be agreed in writing. I agree with both suggestions. I have also altered 'developer' to 'wind farm operator' in the interests of consistency with draft noise condition 2.
177. The council has suggested, with the support of DBJRG, that a fifth noise condition would be necessary seeking details of the actual wind turbine design and technical specification which it is intended to install. Notwithstanding the case of *R v. Rochdale MBC* to which I have previously referred, the appellant considers such a requirement is unnecessary. One of the purposes of the planning system is to seek to anticipate and forestall adverse impacts on the living conditions of neighbours. To this end details of design and technical specifications are a useful source of information, but absolute predictability is neither possible nor necessary. It is in order to minimise the effect of uncertainty that conditions would be necessary and reasonable. What would matter in the current case would be that the noise immissions at the receptor locations would not exceed the specified limits. The design and technical specification of the turbine would be irrelevant.
178. The DBJRG also made some observations on the schedule of Notes which supplement the draft noise conditions. In relation to Note 2(a) it is suggested that other meteorological criteria should be added – wind shear level, frozen ground and cloud cover. I agree that these are important variables. At Note 2(b) the need to specify adjacent rain gauges and to avoid atypical data points should be specified. I have included references to both these matters. At Note 2(c) a 3rd order polynomial is recommended. The appellant's preference is for a 2nd order polynomial. In my view either would be sufficient for its purpose, and I have therefore retained the Note as drafted.
179. It is in Note 4 that the conditions reach their conclusion. The DBJRG holds that the Note should require that any offending turbine is switched off. I acknowledge that this would be a logical conclusion of the process, but it would clearly constitute a serious step which should only be taken after due consideration of all the circumstances. It would be a matter for the council in the first instance. In this respect I agree with the appellant that such action falls to be specified in either a Breach of Condition Notice or an Enforcement Notice. I anticipate that the scheme required by draft noise condition 4 would

inevitably involve switching off selected turbines for temporary periods in order to permit the necessary evaluation.

180. The DBJRG has provided an alternative noise condition³⁹ and a reasoned justification⁴⁰ to those agreed between the appellant and the council. I have considered the alternative but I can see no obvious advantage over the draft conditions and their supplementary notes discussed above.
181. However, as is evident from my consideration of the possible noise impact of the proposed wind farm, I am concerned about the effect of greater than anticipated AM⁴¹ arising at the site. At my instigation DBJRG has drafted a condition designed to regulate this possibility⁴² and prepared a reasoned justification⁴³, and this has been the subject of a response by the appellant⁴⁴.
182. The appellant objects in principle to the inclusion of a condition designed to regulate AM on the grounds that excessive AM is rare; stable atmospheric conditions are rare at the appeal site; it is not recommended in ETSU-R-97; and there is insufficient knowledge to achieve the necessary balance between the preservation of amenity without causing profound damage to the UK wind industry.
183. In my opinion these misgivings are either overstated or misleading. I do not see that the rarity of the circumstance constitutes a valid reason to object to such a condition. If it is unlikely, then it is equally unlikely that it would be necessary to enforce the condition. On the basis of the evidence I have heard I am satisfied that the phenomenon is not fully taken into account in ETSU-R-97, and the condition proposed is of a precautionary nature. I would have more sympathy with the appellant's view had the purpose of ETSU-R-97 been merely the preservation of amenity, but it is not. From the viewpoint of wind farm neighbours the most important purpose of ETSU-R-97 would be more accurately described as the preservation of sleep. Taking account of both this and the uncertainties to which I have already referred, it is for these reasons that in my opinion the imposition of conditions is both necessary and reasonable.
184. The appellant complains that the condition drafted by DBJRG contains subjective elements, but I cannot see this. I fear the psycho-acoustic approach suggested by the appellant would be likely to be significantly more subjective. The possibility of a penalty approach is suggested similar to that included in ETSU-R-97 for a tonal component and as cited in Note 3. However, I have received no details of an appropriate sliding scale. I do accept nevertheless that the proposed condition would benefit from redrafting in order to clarify its content and purpose. I have amended it to this effect.

Overall conclusion

185. Paragraph 1(i) of PPS22 states that renewable energy developments should be capable of being accommodated throughout England in locations where the

³⁹ Document 46

⁴⁰ Document 49

⁴¹ That is, greater than anticipated in ETSU-R-97.

⁴² Document 45

⁴³ Document 50

⁴⁴ Documents 54 and 53

technology is viable and environmental, economic, and social impacts can be addressed satisfactorily. Similarly, and notwithstanding the extensive landscape protection policies which are integral to the planning system, paragraph 19 effectively requires that proposals are considered on a case by case basis. In the identification of the main issues in this case I have sought to balance the requirement that any adverse effects on the locality should be weighed against the widely accepted benefits of renewable energy generation. As is so often the case with planning decisions, the effects of both the development proposed and the policies of the development plan pull in different directions.

186. As far as the effect of the scheme on the character and appearance of the surrounding area is concerned, I have concluded that although the development would result in the creation of a localised zone in which the turbines would dominate the landscape character, this would diminish quite rapidly. I see no significant objection to the proposed development in relation to its effect on the historic environment. In visual terms however, I believe there would be locations to the north of the appeal site which would be harmed by the development. In contrast, I have concluded there would be no equivalent effect in relation to the local ecology. The effect of the scheme on the noise environment was the subject of much evidence and occupied a significant proportion of the inquiry. The issue is the subject of specific guidance, but I am concerned that with the growth of knowledge and the advent of larger commercial machines, ETSU-R-97 is not now as applicable as previously. However, subject to some important conditions, I have concluded that the effect of the scheme is likely to fall within the limits which were designed, in part, for the protection of wind farm neighbours. I have also taken account of other matters which I did not consider constituted main issues but which were raised by contributors to the inquiry.

187. In conclusion, the harm I have identified is fairly limited. In respect of the landscape protection provisions of the development plan there is conflict with structure plan Policy CO1, local plan Policy NE10, and Policy EN 1 of RPG 10. The protection of the landscape is also a component of Policy RE 6 of RPG 10, of structure plan Policy CO12, and of local plan Policy PS10. The purpose of these policies is to support the exploitation of renewable energy, but they require in each case that a balance is struck. The latter policies also require that account is taken of the living conditions of nearby residents. The purpose of structure plan Policy CO16 and local plan Policy BE18 is more specific – to protect existing residents from noise pollution. This is also one of the purposes of ETSU-R-97. I have concluded that, subject to conditions to regulate its impact, the scheme would conflict with neither Policy CO16 nor Policy BE18, and that the conflict with the landscape policies to which I have referred is sufficiently limited to be outweighed by the purposes of structure plan Policy CO12, local plan Policy PS10, and Policy RE 6 of RPG 10. It is for the reasons given above that I have concluded the appeal should be allowed.

Andrew Pykett

INSPECTOR

APPEARANCES

FOR THE LOCAL PLANNING AUTHORITY:

Mr Peter Wadsley	of Counsel, instructed by the Solicitor to West Devon Borough Council
He called:	
Ms Frances Griffith BA FSA MIFA	Devon County Archaeologist
Mr Mark Holland BA(Hons) DipLA CMLI	Chris Blandford Associates
Mrs Jane Hart BA MSc MRTPI	Chief Planning Officer, West Devon Borough Council

FOR THE APPELLANT:

Mr Marcus Trinick	Partner, Eversheds LLP
He called:	
Mr Colin Goodrum BSc(Hons) DipLA MLI	LDA Design
Mr David Stewart MA(Cantab) DipTP MRTPI	David Stewart Associates
Dr Stephen Holloway BSc(Hons) PhD MIEEM CEnv	Andrew McCarthy Associates
Dr Janet Barlow BSc(Hons) MSc PhD	Department of Meteorology, University of Reading
Dr Andrew McKenzie BSc(Hons) PhD MIOA	Hayes McKenzie Partnership

FOR THE DEN BROOK JUDICIAL REVIEW GROUP Ltd:

Mr Reuben Taylor	of Counsel, instructed by Ms Susan Ring of Richard Buxton Solicitors
He called:	
Ms Sarah Reynolds BSc(Hons) DipLD MA MLI	The Landscape Partnership
Mrs Pamela Coles	Local resident
Mr Ivan Buxton	Wildlife warden
Mrs Jane Davis RN RM RHV MA	Resident of Deeping St Nicholas, Lincolnshire
Mrs Clair Hodgson BA	Local resident
Dr Lee Hoare PhD	Data analyst
Mr Michael Stigwood FRSPA MIOA	MAS Environmental

FOR THE CAMPAIGN TO PROTECT RURAL ENGLAND:

Mr T J W Hale	Chairman, Devon CPRE
He called himself and: Mr James Paxman BA	Chief Executive, Dartmoor Preservation Association
Dr P A W Bratby BSc PhD ARCS	Energy consultant

WRITTEN STATEMENTS AND LETTERS BY INTERESTED PERSONS

OBJECTORS

Mr Justin Whittaker
Cllr James McInnes
Dr & Mrs K E Whitaker
Mr Nick Jewell
Ms Lesley Jewell
Mr David Gribble
Mr Luke de Haan
Mr George Livingstone-Learmouth
Ms Ruth Harvey
Cllr Paul Rogers
Ms Christine Lovelock
Ms Brenda Ware, for Bow Parish Council
Mr J K Welsbey, for Zeal Monachorum Parish Council
Ms Nicola Poultney, for Visit Devon
Mr Martin Quick
Mr Q Morgan Edwards
Mr Tony Wood
Ms Muriel Goodman
Ms Alix Quested
Ms Maggie Greaves
Mr P F Coles
Mr Peter Green, for Bow and District Historical Society
Mr Michael Addison
Ms Alison Thornton
Mr Colin Stabler
Ms Christine Stabler
Ms Anne Ramsey
Ms Carol Hughes
Cllr Jenny Rosser
Ms Maureen Thomson
Mr Peter Hadden

SUPPORTERS

Mr C D Bell
Ms Nan Pratt
Mr John Vincent
Mr Francis George Macnaughton
Ms Eva Ritchie
Dr Steve Ritchie
Ms Deborah Marshall, with Dan Marshall and Kira Moore
Mrs M B Williams

DOCUMENTS SUBMITTED DURING THE INQUIRY

- 1 Statement of Common Ground, including draft conditions
- 2 Bundle of supporting statements and letters, submitted by the appellant
- 3 Opening Statement by Mr Trinick for the appellant
- 4 Opening Statement by Mr Wadsley for the council
- 5 Opening Statement by Mr Hale for the CPRE
- 6 Opening Statement by Mr Taylor for DBJRG
- 7 Letter of support dated 15 July 2009 from the Mortenhampstead Action Group for Sustainability
- 8 Answer to RES Development's rebuttal of Zeal Monachorum Parish Council's paper on the impact of the proposed wind farm at Den Brook
- 9 Viewpoint Assessment and Effects, submitted for DBJRG
- 10 Wireframe Views, Viewpoints J K N Q U V and Y, submitted for the appellant
- 11 Landscape & Visual Impact significance tables, submitted for DBJRG
- 12 Photograph N, submitted for DBJRG
- 13 Agreed note on photograph viewpoints, including wireframes for Viewpoints G W and X, submitted for DBJRG and the appellant
- 14 Map showing photograph locations wider setting, submitted for DBJRG
- 15 Installed Renewable Energy Capacity Targets and Operational, Consented, Appeal Pending, Applications Pending and Pre-Planning Proposals in Devon, submitted for the council and the appellant
- 16 Note – height of cheese factory at North Tawton, submitted for the council
- 17 Note – Area of Great Landscape Value and the wind farm character zone, submitted for the council
- 18 Plan showing areas of impact, submitted for the appellant
- 19 Letter of support dated 25 July 2009 from Exeter Friends of the Earth
- 20 Note – CPRE Tranquility mapping, submitted for CPRE

- 21 Two large biomass proposals in the South West Region, submitted by the council
- 22 Pages 1-4 Climate Change Act 2008, submitted by CPRE
- 23 BWEA Statistics 2008, submitted by the council
- 24 Letter and enclosures dated 30 July 2003, Scheduled Ancient Monuments: West Devon, submitted by the council
- 25 Note – Wind shear model used to calculate wind speed at turbine hub height, Submitted by the appellant
- 26 Draft non-noise conditions: Comments of DGJRB
- 27 Additional draft condition, submitted by the council
- 28 Note – grid connection wayleaving, submitted by the appellant
- 29 Extract from Option Agreement, submitted by CPRE
- 30 Chapter 7, Draft Revised RSS for the South West incorporating the Secretary of State’s Proposed Changes, July 2008, submitted by the council
- 31 *The UK Low Carbon Transition Plan*, submitted by the council
- 32 Exchange of letters dated 21 August and 1 October 2009 between Mr Philip Mulligan and Lord Hunt of Kings Heath, submitted by the appellant
- 33 Plan showing proximity of North Wyke and Halse Farm, submitted by the appellant
- 34 *Derbyshire Dales District Council and Peak District National Park Authority v. Secretary of State for Communities and Local Government and Carsington Wind Energy Limited* [2009], submitted by the appellant
- 35 *The UK Renewable Energy Strategy*, submitted by the appellant
- 36 *R v. Rochdale MBC* [2000], submitted by DBJRG
- 37 CPRE Policy Position Statement *Onshore Wind Turbines*, submitted by the appellant
- 39 Den Brook Wind Farm – Planning Conditions 2009, submitted by the appellant
- 40 Draft Statement of Common Ground (Noise)
- 41 Email dated 6 October 2009 and Draft Noise Conditions
- 42 Diagram, submitted by the appellant
- 43 Number 10 official website extract, submitted by DBJRG
- 44 *Night Noise Guidelines for Europe*, World Health Organization, submitted by DBJRG
- 45 Draft noise condition for Amplitude Modulation, submitted by the DBJRG
- 46 Draft noise condition for Wind Farm noise, submitted by the DBJRG
- 47 Den Brook Wind Farm – Planning Conditions 2009
- 48 Third International Meeting on Wind Turbine Noise, Aalborg, Denmark, submitted by the DBJRG
- 49 Rationale for general noise level condition for Wind Farm noise, Den Brook, submitted by the DBJRG
- 50 Rationale to the Den Brook excess Amplitude Modulation condition, submitted by the DBJRG
- 51 MAS Errata, submitted by the DBJRG
- 52 Den Brook Wind Turbines – Human Rights Issues, submitted by Mr Hadden

- 53 Comments on DBJRG's draft noise condition for Amplitude Modulation, submitted by the appellant
- 54 Comments on DBJRG's draft noise condition for Wind Farm noise, submitted by the appellant
- 55 *North Wiltshire District Council v. Secretary of State for the Environment and Clover* [1992], submitted by the council
- 56 *National Wind Power v. The Secretary of State for the Environment, Transport and the Regions and others* [1999], submitted by the council
- 57 Closing Submission by Mr Hale
- 58 Closing Submissions by Mr Taylor
- 59 Closing Statement by Mr Wadsley
- 60 Closing Submissions by Mr Trinick (read by Mr Paul Maile)
- 61 Appeal Decision dated 1 December 2006, submitted by the appellant
- 62 Appeal Decision dated 15 January 2008 APP/V3310/A/2031158, submitted by the appellant
- 63 *The impact of wind farms on the tourist industry in the UK*, submitted by the appellant
- 64 Letter dated 15 November 2006 from English Heritage, submitted by the appellant
- 65 Draft conditions, final version, submitted by the appellant
- 66 Draft noise conditions, final version, submitted by the appellant
- 67 Email dated 11 November 2009 concerning lighting specification, submitted by the council

Schedule of Conditions

1. The development hereby permitted shall begin not later than 4 years from the date of this decision.
2. Other than in respect of the temporary construction compound and the 2 temporary meteorological masts shown in figures 3.1, 3.9 and 3.10 of the Environmental Statement (Volume III), the permission hereby granted is for the proposed development to be retained for a period of not more than 25 years from the date that electricity from the development is first supplied to the grid, this date to be notified in writing to the local planning authority. By no later than the end of the 25 year period the turbines shall be decommissioned and all related above ground structures shall be removed from the site. Six months before the due date for the decommissioning of the turbines, a scheme for the restoration of the site shall be submitted and approved in writing by the local planning authority. The scheme shall make provision for the removal of all the above-ground elements, plus 1m of the concrete turbine base below ground level, and all associated equipment before its return to agricultural use. The scheme shall include details of the phasing of the works. Upon approval, the restoration scheme shall be implemented in accordance with the phasing details, the turbines having been removed not later than the due date.
3. The temporary construction compound and the 2 temporary masts referred to in condition 2 above shall be removed within 2 years of the date that electricity is first supplied to the grid, and the ground shall be restored to its previous condition within 6 months thereafter.
4. If any turbine hereby permitted ceases to generate electricity for a continuous period of 12 months all its above-ground elements plus 1m of the concrete turbine base below ground level, save for the access tracks, shall be removed within the ensuing period of not more than 6 months.
5. No work shall commence on site until a Construction Method Statement including details of all on site construction, drainage, mitigation, restoration and reinstatement works, together with details of their timetabling has been submitted to and approved in writing by the local planning authority. This shall detail the following:
 - The construction of the access into the site from A3072 and the creation and maintenance of associated visibility splays, as illustrated in figures 3.1 and 10.5 of the Environmental Statement (Volume III);
 - The nature and use of access by rail, including any improvement works (eg signals, passing loop) for the purposes of transporting construction materials and turbine components to or from the site;
 - The formation of the construction compound;
 - The construction of the crane pads;
 - The carrying out of foundation works;
 - The construction of the sub-station and control building;

- The erection of the meteorological masts;
- The arrangements to be made for the cleaning of the site entrances and the adjacent public highway;
- The formation of the access tracks and any areas of hardstanding;
- The post-construction restoration/reinstatement of the working areas;
- The measures to be taken to avoid any damage to on-site archaeological remains that are to remain in-situ.

Construction shall only take place in accordance with the methods as approved.

6. No development shall take place until details of the following have been submitted to, and approved in writing by, the local planning authority:
 - (a) The external finish and colour of the proposed turbines, which shall be pale grey with a semi-matt finish; and
 - (b) The materials to be used in the construction of the external surfaces of the proposed buildings.

The development shall be carried out in accordance with the approved details, and there shall be no subsequent change to the finish or coloration of the turbines.

7. All the turbine blades shall rotate in the same direction.
8. Before the commencement of the development hereby permitted a scheme of illumination of the most northerly (T5), southerly (T3), and westerly (T10) turbines shall be submitted to and approved in writing by the local planning authority. The scheme shall provide for 25 candela omni-directional lighting in the horizontal plane (360°). In the vertical plane the lighting shall be limited to the sector between 15° below and 30° above the horizon. The lighting shall be night vision goggle compatible or infra-red lighting on the hubs of the turbines. The scheme shall be implemented as approved by the date that electricity is first supplied to the grid.
9. Before development commences a scheme shall be submitted to and approved in writing by the local planning authority for the ecological mitigation and compensation measures proposed within the site incorporating the principles set out in Tables 6.15 and 6.16 of the Environmental Statement (Volume II) and the amended habitat mitigation plan set out in Figure 6.21 Rev 0.1. The scheme, as approved, shall be implemented throughout the construction and operational phases of the development.
10. The development hereby permitted shall not commence until a programme of archaeological work has been implemented in accordance with a written scheme of investigation submitted to and approved in writing by the Local Planning Authority.

11. The development hereby permitted shall not commence until a scheme to avoid the incidence of shadow flicker at any dwelling or other sensitive property has been submitted to and approved in writing by the local planning authority. The scheme shall be implemented as approved and as necessary.
12. The development hereby permitted shall not commence until a scheme to secure the investigation and alleviation of any electro-magnetic interference to television and radio reception, caused by the operation of the wind turbines, has been submitted to and approved in writing by the local planning authority. The procedure set out in the approved scheme shall be followed at all times.
13. The development hereby permitted shall not commence until a detailed Construction Management Scheme for off-site highways works has been submitted to and approved in writing by the local planning authority. This shall include a Traffic Management Plan for the routing of construction traffic to and from the site, addressing in particular the movement of abnormal loads, the arrangements to be made for any Highways Act Agreement that may be required, and the re-instatement of off-site works not needed to be retained after the construction phase. The development shall be carried out in accordance with the approved scheme.
14. Notwithstanding the statement prepared in accordance with condition 5 above, construction work shall take place only between the hours of 07:00 and 19:00 on Monday to Friday inclusive, 07:00 and 13:00 on Saturdays with no such working on a Sunday or local or national public holiday. Outside these hours, development at the site shall be limited to turbine erection, maintenance, dust suppression and the testing of plant and equipment or construction work that is not audible from any noise-sensitive property outside the site. The receipt of any materials or equipment for the construction of the site, other than turbine blades, nacelles and towers, is not permitted outside the said hours.
15. The development hereby permitted is confined to 3-bladed horizontal axis wind turbines with a maximum height to the blade tip of 120m above ground level.
16. The rating level (as defined in the Glossary of PPG24: *Planning and Noise*) of noise immissions from the combined effects of the wind turbines (including the application of any tonal penalty), when assessed in accordance with the attached Guidance Notes, shall not exceed the values set out in the attached Tables 1 and 2 below. Noise limits for dwellings which lawfully existed at the date of this permission but not listed in the Tables attached shall be those at the nearest location listed in the Tables.
17. At the request of the local planning authority following a complaint the wind farm operator shall, at its expense, employ a consultant approved

by the local planning authority, to assess the level of noise emissions from the wind farm at the complainant's property following the procedures described in the attached Guidance Notes. A report of the assessment shall be provided in writing to the local planning authority within 56 days of a request under this condition unless this period is extended by the local planning authority in writing.

18. Wind speed, wind direction and power generation data for each wind turbine shall be continuously logged and provided to the local planning authority at its request and in accordance with the attached Guidance Notes within 56 days of such a request.
19. No wind turbine shall generate electricity to the grid until the local planning authority, as advised by a consultant approved by the local planning authority at the expense of the operator, has approved in writing a scheme submitted by the wind farm operator providing for the measurement of noise immissions from the wind turbines. The objective of the scheme (which shall be implemented as approved) shall be to evaluate compliance with condition 16 in a range of wind speeds and directions and it shall terminate when compliance with condition 16 has been demonstrated to the satisfaction of and agreed in writing by the local planning authority.
20. At the request of the local planning authority following the receipt of a complaint the wind farm operator shall, at its expense, employ a consultant approved by the local planning authority, to assess whether noise immissions at the complainant's dwelling are characterised by greater than expected amplitude modulation. Amplitude modulation is the modulation of the level of broadband noise emitted by a turbine at blade passing frequency. These will be deemed greater than expected if the following characteristics apply:
 - a) A change in the measured $L_{Aeq, 125 \text{ milliseconds}}$ turbine noise level of more than 3 dB (represented as a rise and fall in sound energy levels each of more than 3 dB) occurring within a 2 second period.
 - b) The change identified in (a) above shall not occur less than 5 times in any one minute period provided the $L_{Aeq, 1 \text{ minute}}$ turbine sound energy level for that minute is not below 28 dB.
 - c) The changes identified in (a) and (b) above shall not occur for fewer than 6 minutes in any hour.

Noise immissions at the complainant's dwelling shall be measured not further than 35m from the relevant building, and not closer than within 3.5m of any reflective building or surface, or within 1.2m of the ground.

21. No wind turbine shall generate electricity to the grid until the local planning authority, as advised by a consultant approved by the local planning authority at the expense of the operator, has approved in writing a scheme submitted by the wind farm operator providing for the measurement of greater than expected amplitude modulation immissions generated by the wind turbines. The objective of the scheme (which shall be implemented as approved) shall be to evaluate compliance with condition 20 in a range of wind speeds and directions and it shall

terminate when compliance with condition 20 has been demonstrated to the satisfaction of and agreed in writing by the local planning authority.

SCHEDULE OF GUIDANCE NOTES RELATING TO CONDITIONS 16 - 18

These notes (or any superseding equivalent UK adopted procedure) are to be read with conditions 16 - 18. They further explain these conditions and specify the methods to be deployed in the assessment of complaints about noise immissions from the wind farm.

NOTE 1

(a) Values of the $L_{A90,10min}$ noise statistic should be measured at the complainant's property, using a sound level meter of IEC 651 Type 1, or BS EN 61672 Class 1, standard (or the equivalent relevant UK adopted standard in force at the time of the measurements) set to measure using a fast time weighted response. This should be calibrated in accordance with the procedure specified in BS 4142: 1997 (or the equivalent relevant UK adopted standard in force at the time of the measurements).

(b) The microphone should be mounted at 1.2 - 1.5m above ground level, fitted with a two layer windshield or suitable equivalent approved by the local authority, and placed outside the complainant's dwelling. Measurements should be made in "free-field" conditions, so that the microphone should be placed at least 3.5m away from the building facade or any reflecting surface except the ground.

(c) The $L_{A90,10min}$ measurements should be synchronised with measurements of the 10-minute arithmetic average wind speed and with operational data from the turbine control systems of the wind farm.

(d) The wind farm operator shall continuously log arithmetic mean wind speed and arithmetic mean wind direction data in 10 minute periods from the hub height anemometer on the site to enable compliance with the conditions to be evaluated. Such data shall be 'standardised' to a reference height of 10m as described in ETSU-R-97 at page 120 using a reference roughness length of 0.05m.

NOTE 2

(a) The noise measurements should be made so as to provide not less than 20 valid data points as defined in Note 2 paragraph (b). Such measurements should provide valid data points for the range of wind speeds, wind directions, wind shear levels, frozen ground, cloud cover, times of day and power generation requested by the local planning authority. In specifying such conditions the local planning authority shall have regard to those conditions which were most likely to have prevailed during times when the complainant alleges there was disturbance due to noise. At its request the wind farm operator shall provide all of the data collected under condition 17 to the local planning authority.

(b) Valid data points are those that remain after all periods during rainfall have been excluded as informed by a rain gauge sited adjacent to the measurement location. Additional atypical data as agreed by the local planning authority shall also be removed.

(c) A least squares, "best fit" curve of a maximum 2nd order should be fitted to the data points and define the rating level at each integer speed.

NOTE 3

Where, in the opinion of the local planning authority noise immissions at the location or locations where assessment measurements are being undertaken contain a tonal component, the following rating procedure should be used.

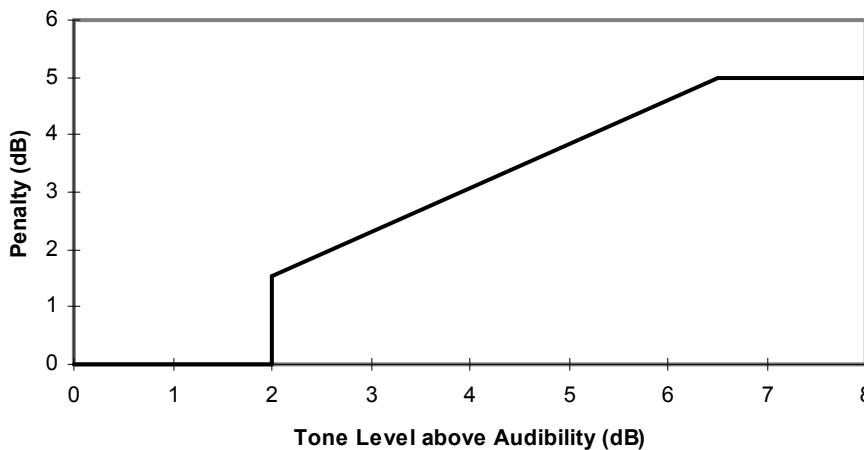
(a) For each 10-minute interval for which $L_{A90,10min}$ data have been obtained as provided for in Note 1 a tonal assessment is performed on noise immissions during 2 minutes of each 10 minute period. The 2 minute periods should be regularly spaced at 10 minute intervals provided that uninterrupted clean data are available. Where clean data are not available, the first available uninterrupted clean 2 minute period out of the affected overall 10 minute period shall be selected. Any such deviations from standard procedure shall be reported.

(b) For each of the 2-minute samples the margin above or below the audibility criterion of the tone level difference, ΔL_{tm} , should be calculated by comparison with the audibility criterion given in paragraph 2.1 on pages 104-9 of ETSU-R-97.

(c) The margin above audibility is plotted against wind speed for each of the 2-minute samples. For samples for which the tones were below the audibility criterion or no tone was identified, substitute a value of zero audibility.

(d) A linear regression should then be performed to establish the margin above audibility at the assessed wind speed for each integer wind speed. If there is no apparent trend with wind speed then a simple arithmetic average shall be used.

(e) The tonal penalty is derived from the margin above audibility of the tone according to the figure below. The rating level at each wind speed is the arithmetic sum of the wind farm noise level, as determined from the best fit curve described in Note 2, and the penalty for tonal noise.



NOTE 4

If the rating level is above the limit set out in the conditions, measurements of the influence of background noise should be made to determine whether or not there is a breach of condition. This may be achieved by repeating the steps in Note 2, with the wind farm switched off, and determining the background noise at the assessed wind speed, L_3 . The wind farm noise at this speed, L_1 , is then calculated as follows where L_2 is the measured level with turbines running but without the addition of any tonal penalty:

$$L_1 = 10 \log \left[10^{L_2/10} - 10^{L_3/10} \right]$$

The rating level is re-calculated by adding the tonal penalty (if any) to the derived wind farm noise L_1 . If the rating level lies at or below the values set out in the conditions then no further action is necessary. If the rating level exceeds the values set out in the conditions then the development fails to comply with the conditions.

TABLES OF NOISE LIMITS RELATING TO CONDITION 16

Table 1: Between 23:00 and 07:00 hours (Noise Level in dB $L_{A90, 10min}$)

Location	Standardised Wind Speed at 10 m height (m/s)											
	1	2	3	4	5	6	7	8	9	10	11	12
Halse Farm	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	48.9	52.0	54.4	55.8
Itton Manor	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	48.7	51.7	54.2
Ham Farm	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	47.2	52.7
Crooke Cottage	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.9	49.7
Crooke Burnell	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.9	49.7
Broadnymett	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.1	46.8	50.6	54.4	58.0
Coxmoor	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.6	49.5	53.3	56.9	59.9

Table 2: At all other times (Noise Level in dB $L_{A90, 10min}$)

Location	Standardised Wind Speed at 10 m height (m/s)											
	1	2	3	4	5	6	7	8	9	10	11	12
Halse Farm	37.5	37.5	37.5	37.5	38.0	40.5	43.6	46.9	50.1	53.0	55.4	56.9
Itton Manor	37.5	37.5	37.5	37.5	37.5	37.5	40.1	43.1	46.0	48.7	50.7	52.0
Ham Farm	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.9	40.2	42.8	45.3	47.6
Crooke Cottage	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.9	40.6	43.5	46.6	49.7
Crooke Burnell	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.6	43.5	46.6	49.7
Broadnymett	37.5	37.5	37.5	37.5	37.5	37.6	40.4	43.5	46.6	49.7	52.4	54.7
Coxmoor	37.5	37.5	37.5	37.5	37.5	38.8	42.2	45.9	49.7	53.3	56.4	58.7