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## Appeal Decision

Hearing held on 18 January 2012

Site visit made on 19 January 2012

**by Alan Novitzky BArch(Hons) MA(RCA) PhD RIBA**

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

**Decision date: 7 March 2012**

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**Appeal Ref: APP/Y2003/A/11/2156713**

**Land near to Flixborough Grange Farmhouse, Flixborough, Scunthorpe DN15**

- 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 Grange Wind Farm Ltd against the decision of North Lincolnshire Council.
  - The application Ref WF/2010/1242, dated 21 October 2010, was refused by notice dated 6 April 2011.
  - The development proposed is 7 wind turbines and associated hardstandings, tracks, anemometry mast, switchgear house and underground cables for the purpose of generating electricity.
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### Decision

1. The appeal is allowed and planning permission is granted for 7 wind turbines and associated hardstandings, tracks, anemometry mast, switchgear house and underground cables for the purpose of generating electricity on land near to Flixborough Grange Farmhouse, Flixborough, Scunthorpe DN15 in accordance with the terms of the application, Ref WF/2010/1242, dated 21 October 2010, subject to the conditions set out in the attached schedule.

### Preliminary Matters

2. In their statement of case, the Council noted that they would present no evidence regarding the second reason for refusal, the effect of the proposals on the health and wellbeing of two children who live at 15 Linton Rise, Burton upon Stather, and confirmed that the matter would form no part of the Council's case. It would no longer be pursued because the third party objection had been withdrawn following agreement with the developer on mitigation measures.<sup>1</sup>
3. The proposals are identical to those which were the subject of the Inquiry held in February and March 2010. The appeal was dismissed.<sup>2</sup> It was concluded that the adverse effect of the proposed wind farm on

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<sup>1</sup> Paras 1.2 and 1.3

<sup>2</sup> APP/Y2003/A/09/2105130

the character and views of the landscape and on residential amenity would be collectively outweighed by the long term environmental and economic benefits of the renewable energy scheme, but that the very serious adverse effect on the health and well being of the Glathorne family would not be outweighed by these long term benefits.

4. The Glathorne family have, since then, reached agreement with the developer on mitigation measures. They confirmed this in a letter dated 10 August 2011 to the Planning Inspectorate. Enclosed was a letter dated 20 December 2010 from Mrs J Burnett, retired Head of Service in North Lincolnshire for pupils with Autistic Spectrum Disorders, who had appeared at the Inquiry in support of the Glathorne's case, confirming that the mitigation methods proposed are sufficient to protect the welfare of the children.
5. An Environmental Statement (ES) was submitted with the application. The documents were circulated, placed on deposit and advertised as required by the Town and Country Planning (Environmental Impact Assessment)(England and Wales) Regulations 1999. The environmental information in total meets the statutory requirements.
6. The officers' report to the 9 February 2011 Planning Committee states that the developer will accept a condition limiting the development to six turbines. As noted in their grounds of appeal, the Appellants confirmed to the Council that, although the application comprises a proposed development of 7 wind turbines, should the Council grant planning permission subject to a condition that the nearest turbine to Burton upon Stather should not be built, this would not be challenged. Also, the possible omission of the turbine is referred to in various written representations and was discussed at the Hearing.
7. The omission of the turbine might diminish some of the proposals' impacts but would not compromise the overall analysis in the ES. In my view, it would not alter the nature of the proposed development or prejudice the interests of any party.

### **Main Issues**

8. The main issues are the effect of the proposals on:
  - The character and appearance of the landscape.
  - The living conditions of local residents with regard to noise and any other matters.

### **Reasons**

#### **First Issue - Landscape**

9. A material change in planning circumstances since the 2010 appeal is the adoption, in November 2011, of the Supplementary Planning Document, *Planning for Renewable Energy Development*, (SPD). Policy 2 (Landscape) notes that proposals in areas of high landscape value (AHLV) or which affect their setting will be rigorously assessed. If adverse impacts are identified these should be avoided or mitigated. Should this prove impossible the proposal will be refused.

10. However, local landscape designations were discouraged with the publication of *Planning Policy Statement 7: Sustainable Development in Rural Areas (PPS7)*. Moreover, Policy LC8 (AHLV) was not saved from the North Lincolnshire Local Plan (LP), nor were AHLVs revived in the Core Strategy adopted in June 2011. Therefore, although the designation appears in the SPD, it does not carry development plan weight and landscape policy considerations remain as they were at the previous appeal. Further, the DPD in both Policy 2 and Policy 3 (Visual Effects) gives no indication of the severity of adverse impact which should be avoided or mitigated, and sidesteps the basic planning principle of balancing harm against benefit.
11. Physical landscape considerations have changed since the Inquiry only with regard to cumulative effect. Since the previous appeal, two further wind farms within a 15 kilometre radius of Grange wind farm site have entered the planning system. These are Ironstone Quarry wind farm (4 turbines), and Bradken wind farm (a single turbine). I was told at the Hearing that further information was being sought by the Council on aspects of the Ironstone Quarry scheme before it made its decision, and that the Bradken scheme had been refused.
12. The Appellants have produced studies of the cumulative effects of the turbine arrays, including Ironstone Quarry and Bradken, from three medium distance panoramic viewpoints. I assessed the likely cumulative effects in some detail from various viewpoints during the day of site visits. Moreover, I have considered the effects which would be experienced when travelling through the area.
13. The individual and cumulative effects of the Ironstone Quarry and Bradken schemes must be judged on their own merits. However, the addition of the Grange wind farm to the arrays considered, including Ironstone Quarry and Bradken were they approved and constructed, would not make an appreciable difference to the overall effect on the visual or landscape character, satisfying DPD Policy 10 (Cumulative Effects).
14. I understand the high value placed on the local landscape by residents, evident in the strength of feeling expressed at the Hearing, However, overall, I see no reason to differ from the previous Inspector's conclusion on landscape and visual matters. In paragraph 11 of his decision, he notes that the Grange wind farm would have a significant adverse effect on the character of the landscape and on views in the immediate area of the site but only a minor adverse effect in more distant views. The proposals would, therefore, conflict with LP Policy LC7 (Landscape Protection), but this must be balanced against any benefits of the proposals.

## **Second Issue** – Living Conditions

### *Noise*

15. SPD Policy 8 (Noise) requires consideration of the proximity of noise sensitive developments, and a noise assessment. Current national

advice is that noise assessments should be carried out in accordance with the ETSU-R-97 report (ETSU).

16. The Council raised several points of objection in their statement of case concerning the noise assessment, despite having accepted it at the Inquiry.<sup>3</sup> It was agreed at the Hearing that all but two could be satisfactorily controlled by condition. The remaining points are, firstly, lack of clarity regarding rainfall data and, secondly, potential inaccuracies in noise monitoring at locations M3 and M4.
17. The Council's noise witness contends that noise measurements should be disregarded during periods of rainfall because of the possibility of increased background noise, including that from streams and rivers. Burton Against inappropriate Turbines (BATS) witnesses drew particular attention to M4, within Burton Wood, the nearest monitoring point to Burton upon Stather, where they argue that the impact of rain on foliage or on the carpet of fallen leaves would distort readings.
18. ETSU notes that data recorded during periods of rainfall, or afterwards, where rainfall may have affected flow in nearby rivers or streams, should be discarded.<sup>4</sup> However, in this case, streams would not have been audible at monitoring points and it is unlikely that the River Trent would have been affected to a material extent during monitoring. It is difficult to know what the effects of rainfall on background noise would be in wooded areas. However, given the predominance of industrial background noise, the contribution from rainfall would probably be small.
19. Turning to the point regarding inaccuracies in noise monitoring at M3 and M4 made by the Council, M3 is on the east bank of the River Trent but has been applied to receptors R3, R5 and R6 on the west bank. The Council suggest that M3 would have been better placed in Mere Dyke's garden (R3). However, M3 is directly opposite R3 and represents noise levels near the river which would be experienced by the occupants of Mere Dyke. Had it been placed in Mere Dyke's garden, the road to the west of the river and Livthorpe Kennels might have increased background noise levels. Moreover, placed further north than R5 and R6, M3 gives usable data for these receptors without being unduly influenced by background industrial noise from the south.
20. The Council argues that the background noise level recorded at M4, in Burton Wood, would be increased by wind blowing through the trees. They note that M4's data might be correct for one or two properties near the wood, but not for those in the streets further away in Burton upon Stather. However, it can be argued that, being further away, these streets would also receive lower noise levels from the turbines. Nevertheless, on balance, it would be prudent to omit the turbine nearest Burton upon Stather, reducing the likelihood of noise problems being experienced by Burton upon Stather residents. As has

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<sup>3</sup> Summarised in para 3.2

<sup>4</sup> Page 101, para 1.2.3

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been noted, the Appellants raise no objection to the omission of this turbine.

21. The issue of cumulative noise from surrounding wind farms, including the Keadby array, was raised. However, the existing background noise levels are sufficiently high, and the separation of wind farms would be sufficiently great, to avoid material aggregate effects.
22. Overall, subject to the omission of one turbine, and small adjustments to permissible noise levels at some locations agreed at the Hearing, I see no reason to disagree with the previous Inspector's conclusions on noise in paragraph 14 of his decision. So adjusted, the proposals accord with LP Policy DS11 (Polluting Activities – noise).

#### *Excess Amplitude Modulation*

23. The previous Inspector indicated in his decision that, had the Inquiry appeal been successful, he would have attached conditions to guard against excess amplitude modulation (EAM). Since the decision was issued, professional opinion has cast doubt on the efficacy of EAM conditions derived from that attached in the Den Brook case.<sup>5</sup> The Appellants noted at the Hearing that, besides Den Brook, only one scheme, Swinford,<sup>6</sup> has been conditioned in a similar way. Neither Den Brook nor Swinford have been built and, therefore, it is not possible to benefit from any experience of EAM conditions applied to wind farms in operation.
24. EAM is rare and there is little agreement amongst experts on causes, or means of identifying or quantifying it. Quite innocuous events, such as bird song, can be recorded as EAM by the monitoring equipment. Moreover, there is no reason to suppose that EAM would be a problem in this case and a great deal of confusion and fruitless effort could arise from the use of the EAM conditions suggested. In these circumstances, the suggested conditions would be likely to fail the Circular 11/95 tests of necessity, enforceability and precision.

#### *Visual Effects*

25. I visited several dwellings to estimate the visual effects of the proposals on residential amenity, including some of those which would be closest to the turbines, or would have clear views of the array, and also visited significant local public viewpoints. I also viewed Bagmoor wind farm from Farm Track, which gives a comparable impression to that which would be experienced from Linton Rise under the proposals. The screening effect of Burton Wood would clearly be important in protecting visual amenity, as well as mitigating harm to landscape, were the proposals to proceed.
26. I understand Mr Guilliat's medical condition, but note that his property, number 2 Westover Drive, is a bungalow and is separated from Burton Wood and the site by two storey buildings. It is unlikely that the proposals would create significant visual disturbances at the

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<sup>5</sup> APP/Q1153/A/06/2017162

<sup>6</sup> APP/F2415/A/09/2096369

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property, even glimpsed between the two storey buildings with the trees devoid of leaves in winter. Nor is there persuasive medical evidence to suggest that turbine noise would aggravate Mr Guilliat's condition.

27. Overall, I see no reason to disagree with the previous Inspector's analysis and conclusions in paragraphs 17 and 18 of his decision. However, in addition to helping alleviate concerns over noise, omission of the turbine nearest Burton upon Stather would reduce the adverse effect on visual amenity which he identified. To the extent that harm to residential amenity through visual effects arises, the proposals conflict with LP Policy DS1 (General Requirements – amenity).

#### *Shadow Flicker*

28. Shadow flicker can occur where sun shines directly through the blades of a turbine into a window opening, casting an intermittent shadow at regular periodic intervals within the room. The periodic frequency of shadows cast by wind turbines is not associated with the likelihood of epileptic events and there is no evidence to suggest that reflections off water would aggravate effects. The Environmental Statement (ES) provides an analysis of the theoretical risks of shadow flicker in this case.<sup>7</sup> In practice, the risks would be substantially less because ideal conditions, which are not always present, of clear sky, blades rotating, and blades at right angles to the line between sun and the property are assumed.
29. The ES analysis, which has not been challenged, points to only three properties near enough to be at any risk of shadow flicker, Flixborough Grange, Livthorpe Kennels, and Mere Dyke. Nevertheless, a condition attached to a grant of planning permission would require approval of a protocol for dealing with all complaints concerning shadow flicker. This would involve automatic monitoring of light conditions, and the times they occurred, which could give rise to shadow flicker. Should acceptable parameters be exceeded, the operation of the turbines would be curtailed or other mitigation put in place.
30. In these circumstances, the effects of shadow flicker on residential amenity would be acceptable. Shadow throw, which can be experienced outside buildings, is not intermittent in nature and does not generally give rise to amenity difficulties. Glitter, the effect of sun reflecting off the blades, is not a significant problem. Blades are now designed with a surface which resists reflection.

#### **Other Matters**

31. It was pointed out at the Hearing that although objections had been withdrawn regarding the effect of the proposals on the health and wellbeing of the children of two local families, the effect on other potentially vulnerable children should be considered. There is a primary school in Burton upon Stather not far from the turbine array, and it was suggested that autistic children might attend.

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<sup>7</sup> Volume 4a:Appendix 4.4, pages 1-12

32. However, no evidence was presented to show that autism in itself predisposes towards vulnerability to disturbance from wind farms. A precautionary approach of this kind would unreasonably rule out very many wind farm proposals. Instead, vulnerability should be considered on an individual basis.
33. Concern was expressed at the Hearing that the micro-siting margin of 50 metres, set out in the suggested conditions, could bring turbines unacceptably close to dwellings. Micro-siting is necessary to adjust the final position of each turbine to suit ground conditions. It was agreed that the condition would specify that turbines shall not be sited closer to dwellings than shown in the application details.
34. Concern was also expressed about the loss of screening should Burton Wood be felled. A letter from Sir Reginald Sheffield on behalf of the Normanby Estate confirms agreement to a condition prohibiting felling of mature trees during the lifetime of the wind farm without the prior written consent of the Council.<sup>8</sup> The loss of woodland would harm both visual amenity and the character of the landscape, and conditioning would be necessary. However, another form of condition, directed at the overall management of the woodland, might be more suitable than that suggested in the letter.
35. At the Hearing it was argued that the site is poorly positioned aerodynamically, in the lee of a hill, to generate electricity efficiently. However, it was not possible to evaluate whether the site's location made a material difference to the environmental and economic benefits that would arise.
36. It was also argued that over optimistic claims of output had been made, a criticism that could be applied to many wind farm proposals. However, targets are set in terms of installed capacity rather than capacity factor or actual electricity generated, and it is not the role of the Hearing to question Government policy.

### **Balancing Exercise**

37. The Council maintains that it has exceeded its obligations with regard to targets and that others should play their part before further demands are placed on the local landscape and on the living conditions of its residents. However, the Government has made clear, in its decisions on renewable energy proposals, that targets are not to be regarded as any kind of ceiling, and that all reasonable efforts should be made to exceed targets.
38. The need to establish renewable energy capacity becomes ever more urgent. The Regional Spatial Strategy notes in Policy ENV5 that its targets are minima. Moreover, these targets can be regarded as having significantly increased with the publication of the Renewable Energy Strategy. Furthermore, it is by no means certain what proportion of consented schemes will eventually become operational. There may be substantial doubt over planned biomass schemes.

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<sup>8</sup> Document 3

39. The argument for the environmental and economic benefit of the proposals, therefore, has not weakened since the previous appeal. I see no reason to disagree with the previous Inspector's analysis, in paragraphs 34 to 38 of his decision, of the potential long term effects on landscape of failure to take effective action on climate change. Moreover, I agree with his conclusion at paragraph 44 that the adverse effect of the proposals on the character and views of the landscape and on residential amenity is collectively outweighed by the long term environmental and economic benefits of the renewable energy scheme.
40. LP Policy DS21 (Renewable Energy) states that renewable energy proposals will be permitted provided harm to interests including local character and amenity is outweighed by environmental benefits. In this case, compliance with LP Policy DS21 outweighs conflict with LP Policy LC7 (Landscape Protection) and LP Policy DS1 (Amenity).

### **Conclusion**

41. The adverse effect of the proposals on the health and wellbeing of the Glathorne family is no longer at issue and, for the reasons given, the proposals accord with the aims of the development plan and national policy overall. The proposals are acceptable and the appeal is allowed subject to conditions.

### **Conditions**

42. The conditions set out in the attached Schedule are based on those suggested by the Council and discussed at the Hearing. The conditions relating to time limits and site restoration are necessary to ensure that the wind farm ceases operation after an agreed period and appropriate restoration works are carried out, in the interests of visual and residential amenity. Those requiring approval of design and external appearance of the turbines and blade rotation in the same direction are necessary in the interests of visual amenity, and the micro-siting condition necessary to safeguard residential amenity should flexibility be required in the design of the foundations.
43. The condition referring to illumination is necessary in the interests of visual amenity and air safety. That relating to television and radio interference is necessary to ensure that broadcasting signals are not unacceptably degraded. That requiring approval of a construction management plan is necessary in the interests of public and private amenity and that requiring adherence to a traffic management plan is necessary for the same reasons and in the interests of highway safety.
44. The archaeology conditions seek to preserve and record heritage assets in the public interest. The requirement to supply details of the turbines used is necessary to ensure that environmental effects accord with those predicted in the Environmental Statement. The condition requiring underground cabling is necessary for reasons of visual amenity, and that on shadow flicker to preserve residential amenity.
45. Conditions are included which are necessary to protect and enhance ecology, biodiversity, and wildlife. Conditions requiring

implementation of an approved surface water drainage scheme and development in accordance with the flood risk assessment are necessary to limit flood risk. A condition is included to protect the bridleway in the public interest. The noise conditions are necessary to protect residential amenity, as is the condition limiting working and delivery hours, and the condition requiring retention, management and enhancement of the woodland. The approved plans condition is required for the avoidance of doubt and in the interests of proper planning.

46. The Council suggested aviation conditions at the Hearing which had not previously been canvassed. After the Hearing closed, representations on these conditions were exchanged between the parties, as a result of which I am satisfied that the aviation conditions are not necessary.

**Alan Novitzky**

Inspector

## APPEARANCES

### FOR THE APPELLANT:

David Stewart MA(Cantab) DipTP MRTPI	Principal of David Stewart Associates
Kay Hawkins BSc(Hons) BLD CMLI	Director of E4environment Ltd
Ian Bennett BSc CEng MIOA	Partner of ACIA Engineering Acoustics

### FOR THE LOCAL PLANNING AUTHORITY:

Mark Simmonds	Planning Officer with the Council
Ian Goldthorpe MA BA(Hons) DipURP CMS MRTOI	Principal Environmental Planning Officer with the Council
Richard Watson BEng(Hons) MIOA MAES MIEEE	Partner, Blue Tree Acoustics

### INTERESTED PERSONS:

Steven Fuller	Burton Against inappropriate Turbines (BATS)
Paul Fowler	BATS
Jim Mitchell	BATS
Andrew Vessey	BATS
Councillor Elaine Marper	Ward Councillor and Lead member Adults' and Children's services
Councillor Rob Waltham	Representing Andrew Percy MP
Gill Overington	Local Resident
Shaun Black	Local Resident
Tony Lings	Local Resident
Chris Nutt	Local Resident
Wendy Mitchell	Local Resident
John Cuthbert	Local Resident
Trevor Zimmerman	Local Resident
Kevin Gray	Local Resident
Dave Gilliatt	Local Resident
David Charlesworth	Local Resident
Ian Pringle	Local Resident
Mr Collins	Local Resident

## DOCUMENTS

- 1 Drawing 2010/1242 indicating turbine to be deleted from the application
- 2 Letter dated 8 December 2011 from the Agent to PINS re: SPD *Planning for Renewable Energy Development*
- 3 Letter dated 26 February 2010 from Sir Reginald Sheffield to the Appellant re: condition prohibiting the felling of mature trees
- 4 Draft Grampian Conditions re: Aviation Issues.
- 5 Planning for Renewable Energy Development, Supplementary Planning Document, November 2011

## **SCHEDULE OF CONDITIONS**

1. The development must be begun before the expiration of three years from the date of this permission.
2. This permission is for a period not exceeding 25 years from the date the development is first connected to the electricity grid, such date to be notified to the local planning authority not later than one month from the making of such connection.
3. The development shall be for the construction of six wind turbines with associated tracks, hardstanding, anemometry mast, underground cables and switchgear house, and shall exclude the nearest turbine to Burton-Upon-Stather, as shown on Hearing Document 1, drawing 2010/1242.
4. Within 12 months after the end of the 25-year period pursuant to condition 2 above, all wind turbines, ancillary equipment and buildings shall be dismantled to below ground level and removed from the site, and the land shall be restored in accordance with a decommissioning, restoration and aftercare scheme to be submitted for the written approval of the local planning authority no later than 12 months prior to the expiry of the 25-year period referred to in condition 2 above. The decommissioning process shall proceed in accordance with the approved scheme unless the local planning authority gives its written consent to any variation.
5. If any turbine ceases to be operational for a continuous period of 12 months, it shall be dismantled and removed from the site, and that part of the site shall be restored in accordance with details approved in writing in a scheme to be submitted to the local planning authority no later than 2 months after the expiration of the said period of 12 months.
6. No development shall take place until details of the design and external appearance (including colour finishes) of all turbines and all other buildings and structures have been submitted to and approved in writing by the local planning authority. The development shall be carried out in accordance with the approved details and the colour finishes of the wind turbines shall not be changed without the consent in writing of the local planning authority.
7. The blades of all wind turbines shall rotate in the same direction.
8. Regarding micro-siting, notwithstanding the details submitted with the application, the centre of the tower of each wind turbine shall be sited within 50 metres of the location as shown in Figure 3 in the Environmental Statement (Volume 3) unless the local planning authority gives written consent to any variation. No turbine shall be sited closer to a dwelling than shown in Figure 3.

9. The wind turbines shall not be illuminated other than being fitted with appropriate lighting necessary for aviation safety in accordance with a scheme to be submitted to and approved in writing by the local planning authority.
10. No development shall take place until a scheme of investigation and alleviation of any electromagnetic interference to TV and radio reception, which may reasonably be attributable to the operation of the turbines hereby permitted, has been submitted to and approved in writing by the local planning authority. The procedure in the approved scheme shall thereafter be implemented unless the local planning authority gives its written consent to any variation.
11. No development shall take place until a construction method statement has been submitted to and approved in writing by the local planning authority. Such a scheme shall include details of all on-site construction, drainage, ecology mitigation, restoration/reinstatement work and timetables for all stages of the development. Specifically this method statement shall address but not be limited to the following works:
  - public road works (widening/junction improvements/entrance works)
  - site tracks
  - watercourse crossings
  - construction compounds
  - crane hardstandings
  - cable trenches
  - foundation works
  - substation and control building (including screening of substation with indigenous mix planting)
  - anemometry masts
  - pollution prevention and control plan
  - cleaning of site entrances and the adjacent public highway
  - post-construction restoration/reinstatement of the working areas
  - the presence of an archaeological watching brief during soil stripping in the construction period
  - site drainage plan
  - use of box culverts and sediment control measures
  - soil erosion control measures
  - wheel-washing facilities.

Construction shall be carried out in accordance with the approved construction method statement.
12. No development shall take place until a traffic management plan, based on the details in the Environmental Statement, has been prepared in consultation with the local highway authority and has been submitted to and approved in writing by the local planning authority. Such plan shall include details of access routes for all vehicles carrying turbine parts and any alterations or improvements which may be required to the highway network along these routes, including advisory signs. During construction work all deliveries shall

- be undertaken in accordance with the approved traffic management plan unless the local planning authority gives its written consent to any variation.
13. No development shall take place until implementation of the programme of archaeological work has been secured in accordance with the document 'Grange Wind Farm, North Lincolnshire, Written Scheme of Investigation for Archaeological Mitigation' prepared by Peter Cardwell, dated March 2009 (Report 28/4).
  14. The archaeological mitigation strategies shall be carried out in accordance with the approved details and timings, subject to any variations agreed in writing by the local planning authority.
  15. A copy of any analysis, reporting, publication or archiving required as part of the archaeological mitigation strategies shall be deposited at the North Lincolnshire Historic Environment Record within one year of the date of completion of the development hereby approved by this permission or such other period as may be agreed in writing by the local planning authority.
  16. No development shall take place until details of the make, model and sound power levels, including uncertainty data, of the wind turbines to be erected have been provided to and approved in writing by the local planning authority. The information provided shall be of adequate detail to allow proper comparison with the contents of the Environmental Statement.
  17. All cabling on the application site between the wind turbines and the site substation shall be installed underground.
  18. No development shall take place until a written scheme has been submitted to and approved in writing by the local planning authority setting out the protocol for the assessment of shadow flicker in the event of any complaint, including remedial measures, and turbine shut-down where necessary. Operation of the turbines shall take place in accordance with the agreed protocol unless the local planning authority gives prior written consent to any variations.
  19. No development shall take place until appropriate survey and working methods have been agreed in writing with the local planning authority to safeguard badgers, water voles and breeding birds prior to and during construction. The surveys will establish the breeding status of animals or birds at the time of the proposed construction and work may be delayed or rescheduled in order that animals or breeding birds are not disturbed. Site works shall be carried out in accordance with the working methods agreed. An individual designated by the developer shall have the responsibility of meeting the requirements of this condition and carrying them out as agreed.
  20. Appropriate surveys of protected species and appropriate protection measures for them shall be agreed in writing with the local planning

authority prior to any works of decommissioning being commenced. The decommissioning shall be carried out in accordance with that agreement. The persons or body responsible for the decommissioning works shall designate a person or persons to ensure that all decommissioning work is undertaken in accordance with the terms of that agreement.

21. No development shall take place until details of habitat enhancement, including the establishment of grassland strips, bird seed areas and the restoration of hedgerows of suitable species, have been submitted to and approved in writing by the local planning authority. The work shall be completed at the first available planting season after the development has commenced. Suitable establishment and maintenance methods shall be included in the agreement and work shall be carried out as agreed.
22. Details of a monitoring programme of the effects of the development on birds and bats, covering two years after construction, shall be agreed in writing with the local planning authority. This survey shall be carried out as agreed and the information provided to the local planning authority.
23. No development shall take place until a biodiversity management plan has been submitted to and approved in writing by the local planning authority. The management plan shall be carried out in complete accordance with the approved details and timings, and the approved features shall be retained thereafter, unless otherwise approved in writing by the local planning authority.
24. Development shall not commence until a surface water drainage scheme for the site, based on sustainable drainage principles and an assessment of the hydrological and hydro geological context of the development, has been submitted to and approved in writing by the local planning authority. The scheme shall subsequently be fully implemented in accordance with the approved details before electricity is first produced on site.
25. The development shall be carried out in complete accordance with the flood risk assessment dated October 2010, author H R Wallingford, unless otherwise agreed in writing by the local planning authority. In addition:
  - (i) All the critical components of the turbines shall be located no lower than 600mm above the 0.5% annual probability flood level of 5.835m AOD.
  - (ii) Finished floor levels in the switchgear house and construction compound shall be set no lower than 11m AOD.
26. Access to the compound shall be adjacent to and not over bridleway 304 in accordance with details to be submitted to and approved in writing by the local planning authority.

27. The rating level of noise immissions from the combined effects of the wind turbines (including the application of any penalty for tonality), when calculated in accordance with the attached Guidance Notes, shall not exceed the values set out in Tables 1 and 2 of the attached Guidance Notes. Noise Limits for properties which lawfully exist or have planning permission for construction at the date of this consent, but are not listed in Tables 1 and 2, shall be those of the nearest location listed in these tables, unless otherwise stated by the local planning authority.
28. Prior to the commissioning of the wind turbines the wind farm operator shall submit a scheme for the measurement of noise immissions from the wind turbines to the local planning authority. This scheme shall provide for the measurement of background and specific noise source levels at those locations listed in Tables 1 and 2 of the attached Guidance Notes. Such measurements shall be undertaken in accordance with the procedure described in the attached Guidance Notes. This scheme shall be approved in writing by the local planning authority prior to its execution. Except for the purposes of discharging this condition, the turbines shall not be permitted to commence operation to produce electricity until they are compliant with the noise limits stated in condition 27, including the application of any penalty for tonality.
29. Within 28 days from the receipt of a written request from the local planning authority, following a complaint to it, the wind farm operator shall, at its expense, employ an independent consultant, approved in writing by the local planning authority, to assess the level of noise immissions from the wind farm at the complainant's property following the procedures described in the attached Guidance Notes. If the result of this assessment shows that the noise levels in Tables 1 and 2 of the Guidance Notes are being or have been breached during the last 28 days that the turbines have been operating, then turbine operation shall be immediately suspended. A report of the assessment shall be provided in writing to the local planning authority within 56 days of the appointment of the independent consultant unless this period is extended by the local planning authority in writing.
30. Following the establishment of a breach of the noise limits in condition 27, the wind farm operator shall, within 28 days, submit a scheme to the local planning authority to mitigate the breach to prevent its future occurrence. This scheme shall include the timescales for the implementation of the mitigation works. Following the written approval of the scheme by the local planning authority the scheme shall be implemented forthwith. The operation of the turbines shall remain suspended, except for testing purposes as approved by the local planning authority, until such time as both written proof is submitted to the local planning authority that the wind farm is operating within the noise limits set out in condition 27 and written approval for the commencement of their operation has been given by the local planning authority. The local planning

authority's approval shall be given within 10 days of receiving written proof otherwise operation may be resumed.

31. 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 28 days of such request. The wind farm operator shall retain such data for a period of not less than 12 months.
32. No development shall take place until details of a nominated representative for the development to act as a point of contact for local residents (in connection with conditions 27 to 31 and 33 to 34) have been submitted to the local planning authority together with the arrangements for notifying and approving any subsequent change in the nominated representative. The nominated representative shall have responsibility for dealing with any noise complaints made during the construction, operation and decommissioning of the wind farm and shall liaise with the local planning authority.
33. 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, a tonal penalty shall apply in accordance with Note 3 of the attached Guidance Notes.
34. Construction/decommissioning works, including deliveries to the site, shall only be undertaken during the following hours:  
Monday to Friday – 07:30 to 18:00 hours  
Saturday – 08:00 to 13:00 hours  
No construction/decommissioning works shall be undertaken on site outside of the above hours, or on Sundays or Public/Bank Holidays, without the prior written consent of the local planning authority.
35. No development shall take place until a scheme for the retention, management and enhancement of the woodland defined by green hatching on the plan attached to Hearing Document 3 (the letter dated 26 February 2010 from Sir Reginald Sheffield to Nigel Goodhew), to serve the purpose of a screen throughout the lifetime of the development, has been submitted to and approved in writing by the local planning authority. The scheme shall be carried out as approved.
36. Otherwise than as set out in these conditions, including Condition 8 (micro-siting), the development hereby permitted shall be carried out in accordance with the following approved plans: Figure numbers 3, 5, 8 and 9 within Volume 3 of the Environmental Statement.

## GUIDANCE NOTES RELATING TO NOISE CONDITIONS

These notes are to be read with, and form part of, Conditions 27-33. They further explain these Conditions and specify the methods to be deployed in the assessment of complaints about noise immission from the wind farm.

### Note 1.

- a) Values of the  $L_{A90, 10\text{min}}$  noise statistic should be measured at the complainant's property using a sound level meter of IEC 651 Type 1 quality (or the equivalent relevant UK adopted standard 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 BS4142:1997 (or the equivalent relevant UK adopted standard in force at the time of the measurements). These measurements shall be made in such a way that the requirements of Note 2 below shall also be satisfied.
- b) The microphone should be mounted at 1.2-1.5m above ground level, fitted with a two-layer windshield (or suitable alternative approved in writing from the Local Planning Authority) and placed outside the complainant's dwelling. Measurements should be made in 'free-field' conditions. To achieve this, the microphone should be placed at a location agreed with the Local Planning Authority and at least 3.5m away from the building façade or any reflecting surface except the ground.
- c) The  $L_{A90, 10\text{min}}$  measurements should be synchronised with the 10-minute arithmetic mean average wind speed, power generation, and with operational data from the turbine control systems of the wind farm.
- d) The wind farm operator shall continuously record arithmetic mean wind speed and arithmetic mean wind direction data in 10-minute periods from the nacelle anemometers of the 7 turbines to enable compliance with the Conditions to be evaluated. Derived 10m height wind speeds for each 10-minute period shall be calculated from this measured data through use of the following equation:

$$V_{10} = V_n \times \left( \frac{10}{H_n} \right)^m$$

Where:

$V_{10}$  = Derived 10m height wind speed ( $m.s^{-1}$ )

$V_n$  = Average nacelle wind speed ( $m.s^{-1}$ )

$H_n$  = Nacelle height (m)

$m$  = Wind shear coefficient

The wind shear coefficient shall be obtained from Table 3 or 4 and shall be chosen dependant on the time of day and also the average wind speed and direction measured over the 7 turbine nacelles for each specific 10-minute period. It is this standardised 10m height wind speed data that shall be correlated with the noise measurements in Note 2(a).

**Note 2.**

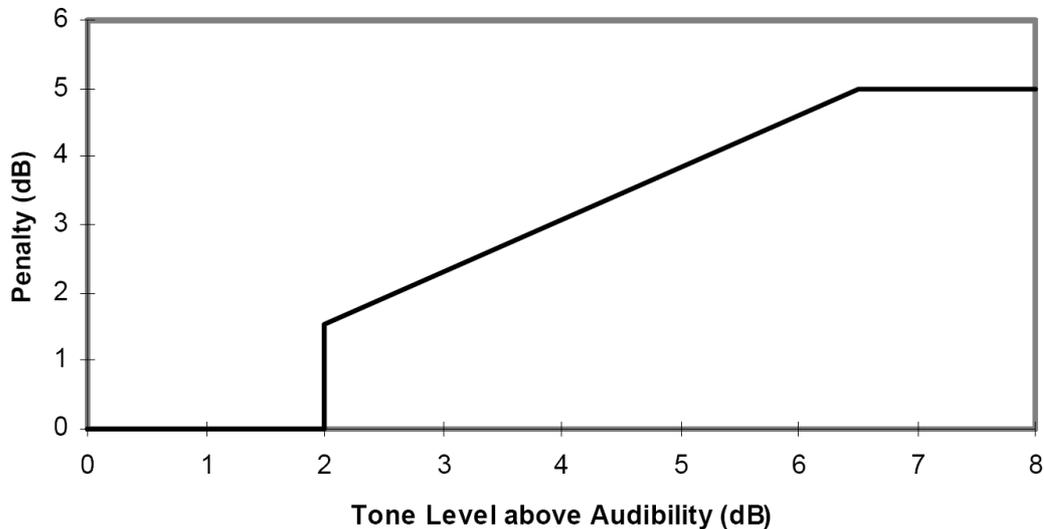
- a) The noise measurements should be made so as to provide not less than 20 valid data points as defined in Note 2 paragraph (b). Such measurements should provide valid data points for the range of wind speeds, wind directions, times of day and power generation requested by the Local Planning Authority. 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 within 28 days all of the data collected under Condition 5 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 in writing by the Local Planning Authority shall also be removed.
- c) A least squares, 'best fit' curve, should be fitted to the data points and define the rating level at each integer wind speed.

**Note 3.**

Where, in the opinion of the Local Planning Authority, noise immissions at the location or locations where assessment measurement 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,  $\Delta L_{tm}$  (delta  $L_{tm}$ ) should be calculated by comparison with the audibility criterion given in Section 2.1 of pages 104-109 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 times 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 levels 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 in order to determine the background noise,  $L_3$ , at the assessed wind speed. The wind farm noise at this wind speed,  $L_1$ , is then calculated as follows, where  $L_2$  is the measured wind farm noise level at the assessed wind speed with turbines running but without the addition of any tonal penalty.

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

The rating level is re-calculated by adding the tonal penalty (if any) to the wind farm noise. If the rating level lies at or below those set out in Condition 1 then no further action is necessary. If the rating level exceeds those set out in Condition 27, then the development fails to comply with Condition 27.

**TABLES OF NOISE LIMITS RELATING TO CONDITION 1**

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

Location	ES Ref	Approximate Grid Reference	Derived 10m Height Wind Speed ( $m.s^{-1}$ )									
			3	4	5	6	7	8	9	10	11	12
Flixborough Grange	R1	SE8583015759	45	45	45	45	45	45	45	45	45	45
Burton Road, Flixborough	R2	SE8700315139	43	43	43	43	43	45	47	49	52	55
Mere Dyke, Northfield Road	R3	SE8502616600	43	43	43	43	43	43	43	43	43	43
Ridgewood Drive, Burton-upon-Stather	R4	SE8693717102	43	43	43	43	43	43	45	45	45	45
Livthorpe Kennels, Northfield Road	R5	SE8500115754	43	43	43	43	43	43	43	43	43	43
Paupers Drain, Northfield Road	R6	SE8507615307	43	43	43	43	43	43	43	43	43	43
Burton Wood House, Flixborough Road	R7	SE8715616199	43	43	43	43	43	43	46	49	52	55

Table. 2 – At all other times (Noise Level  $L_{A 90 10min}$  dB)

Location	ES Ref	Approximate Grid Reference	Derived 10m Height Wind Speed ( $m.s^{-1}$ )									
			3	4	5	6	7	8	9	10	11	12
Flixborough Grange	R1	SE8583015759	45	45	45	45	46	49	49	49	49	49
Burton Road, Flixborough	R2	SE8700315139	41	41	43	44	46	48	51	54	57	61
Mere Dyke, Northfield Road	R3	SE8502616600	37	38	40	41	43	45	45	45	45	45
Ridgewood Drive, Burton-upon-Stather	R4	SE8693717102	37	38	40	42	44	46	46	46	46	46
Livthorpe Kennels, Northfield Road	R5	SE8500115754	37	38	40	41	43	45	45	45	45	45
Paupers Drain, Northfield Road	R6	SE8507615307	37	38	40	41	43	45	45	45	45	45
Burton Wood House, Flixborough Road	R7	SE8715616199	37	38	40	42	44	46	49	52	55	58

**TABLES OF WIND SHEAR COEFFICIENTS**

Table. 3 - Wind Shear Coefficient - Between 07:00 and 23:00 hours

Sector	Measured Wind Speed (m.s <sup>-1</sup> )												
	0	1	2	3	4	5	6	7	8	9	10	11	12
1	1.296	0.642	0.382	0.305	0.197	0.201	0.150	0.175	0.148	0.096	0.132	0.124	0.105
2	1.490	0.379	0.244	0.212	0.200	0.157	0.136	0.121	0.120	0.123	0.108	0.077	-
3	1.165	0.486	0.321	0.192	0.181	0.150	0.117	0.101	0.093	0.110	-	-	-
4	1.081	0.627	0.360	0.247	0.224	0.175	0.162	0.145	0.126	0.127	-	-	-
5	1.231	0.628	0.385	0.292	0.240	0.154	0.163	0.198	0.165	0.115	0.043	-	-
6	1.073	0.484	0.380	0.305	0.221	0.221	0.191	0.182	0.176	0.158	0.160	0.112	-
7	1.053	0.498	0.394	0.308	0.242	0.226	0.195	0.187	0.204	0.221	0.202	0.207	0.168
8	1.210	0.530	0.396	0.326	0.268	0.228	0.203	0.191	0.185	0.178	0.177	0.162	0.142
9	1.171	0.577	0.333	0.262	0.248	0.203	0.157	0.149	0.158	0.149	0.123	0.099	0.068
10	1.408	0.664	0.426	0.349	0.274	0.214	0.181	0.154	0.134	0.106	0.091	0.104	0.098
11	1.484	0.699	0.447	0.360	0.274	0.197	0.194	0.170	0.165	0.124	0.105	0.121	0.113
12	1.454	0.685	0.418	0.308	0.288	0.284	0.270	0.202	0.199	0.224	0.202	0.217	-

Table. 4 - Wind Shear Coefficient - Between 23:00 and 07:00 hours

Sector	Measured Wind Speed (m.s <sup>-1</sup> )												
	0	1	2	3	4	5	6	7	8	9	10	11	12
1	1.288	0.667	0.375	0.297	0.205	0.202	0.267	0.260	0.227	0.198	-	-	-
2	1.312	0.531	0.306	0.205	0.200	0.165	0.153	0.128	0.127	0.138	0.122	-	-
3	1.197	0.590	0.388	0.314	0.228	0.192	0.159	0.122	0.165	0.168	-	-	-
4	1.245	0.633	0.406	0.309	0.230	0.019	G.011	0.206	-	-	-	-	-
5	1.299	0.589	0.398	0.324	0.284	0.217	0.166	0.058	0.029	-	-	-	-
6	1.062	0.546	0.387	0.279	0.240	0.222	0.227	0.223	0.252	0.248	0.210	0.187	0.164
7	1.124	0.571	0.389	0.346	0.288	0.244	0.197	0.153	0.185	0.226	0.210	0.185	0.153
8	1.232	0.644	0.485	0.379	0.324	0.306	0.271	0.230	0.225	0.218	0.209	0.183	0.168
9	1.246	0.712	0.482	0.366	0.300	0.257	0.211	0.205	0.193	0.176	0.153	0.140	0.139
10	1.408	0.773	0.491	0.380	0.328	0.257	0.234	0.208	0.196	0.175	0.161	0.147	-
11	1.581	0.790	0.544	0.422	0.347	0.295	0.281	0.255	0.236	0.210	0.195	0.167	0.160
12	1.455	0.698	0.475	0.398	0.312	0.341	0.310	0.290	0.273	0.256	0.255	0.190	-

Sector 1: >345 ° to <15°, Sector 2: >15 ° to <45°.....

Wind Speed 0: 0 to <0.5m.s<sup>-1</sup>, Wind Speed 1: 0.5m.s<sup>-1</sup> to 1.5 m.s<sup>-1</sup>