

6.0 SHADOW FLICKER

INTRODUCTION

- 6.1 This chapter of the ES assesses the potential for the proposed development to cause shadow flicker impacts on local residents.
- 6.2 As described by the Department of Energy and Climate Change (DECC)¹, shadow flicker “...is the flickering effect caused when rotating wind turbine blades periodically cast shadows through constrained openings such as the windows of neighbouring properties.”

POLICY CONTEXT

National Policy Statement for Renewable Energy Infrastructure (EN-3)

- 6.3 Relevant national policy is set out in the ‘*National Policy Statement for Renewable Energy Infrastructure (EN3)*’ of July 2011. Section 2.7 ‘Onshore Wind’ of EN3 includes a description of potential ‘*Onshore Wind Impacts – Shadow Flicker*’ (paragraphs 2.7.63 to 2.7.72).
- 6.4 As described at paragraph 2.7.64 of EN-3, the potential significance of shadow flicker is dependent on a number of factors, as follows:
- the location of the relevant building relevant to the path of the sun and the turbines;
 - the distance of the turbines from such buildings, the size of the window apertures and their location in the building relative to the turbines;
 - the turbine height and rotor diameter;
 - the presence of intervening topography, buildings or vegetation;
 - the frequency of bright sun and cloudless skies;
 - the time of year; and
 - the prevailing wind direction and hence usual rotor orientation.
- 6.5 EN-3 adds at paragraph 2.7.65 that the occurrence and duration of shadow flicker at a particular occupied building is dependent upon:
- wind speed – wind speed will determine its frequency;
 - wind direction – must allow the rotor to be perpendicular to the dwelling for a shadow flicker effect to take place; and

¹ DECC Shadow Flicker webpage, available online at: http://www.decc.gov.uk/en/content/cms/news/pn11_025/pn11_025.aspx

- cloud cover – must be sufficiently thin to allow the sun to shine brightly enough for shadow flicker to occur.
- 6.6 EN-3 describes research and computer modelling on shadow flicker effects which has indicated that there is unlikely to be a significant impact at distances greater than ten rotor blade diameters from the turbine, as described in Planning Policy Statement (PPS) 22 'Renewable Energy' and its Companion Guide (2004). The Companion Guide also states that shadow flicker effects only occur within 130 degrees either side of north relative to the turbine.
- 6.7 DECC commissioned a research project to update its evidence base on shadow flicker, and a report was produced in March 2011 (available online at the DECC Shadow Flicker webpage). This research determined that current government guidance on shadow flicker is acceptable.

ASSESSMENT METHODOLOGY

- 6.8 By following guidance set out in EN-3, occupied buildings with the potential to be affected by shadow flicker have been identified by mapping the area around the proposed turbine location within a distance of ten rotor diameters (i.e. EWT 54*500 turbine blade diameter of 54 m x 10 = 540 m) and 130 degrees either side of north (the 'shadow flicker study area'). The shadow flicker study area is shown in Figure 6.1.

CONSTRUCTION IMPACTS, MITIGATION & RESIDUAL EFFECTS

- 6.9 Shadow flicker impacts would not occur until the proposed development had been erected and was fully operational. Therefore, no shadow flicker impacts would arise during the construction phase and, therefore, no mitigation is necessary.

OPERATIONAL IMPACTS, MITIGATION & RESIDUAL EFFECTS

Potential Impacts

- 6.10 No residential properties lie within the shadow flicker study area as shown in Figure 6.1. The nearest property, Highermills to the north-east, is located 60 m outside the shadow flicker study area. It is therefore considered that no shadow flicker would be experienced at any property within the vicinity of the turbine.

Photosensitive Epilepsy

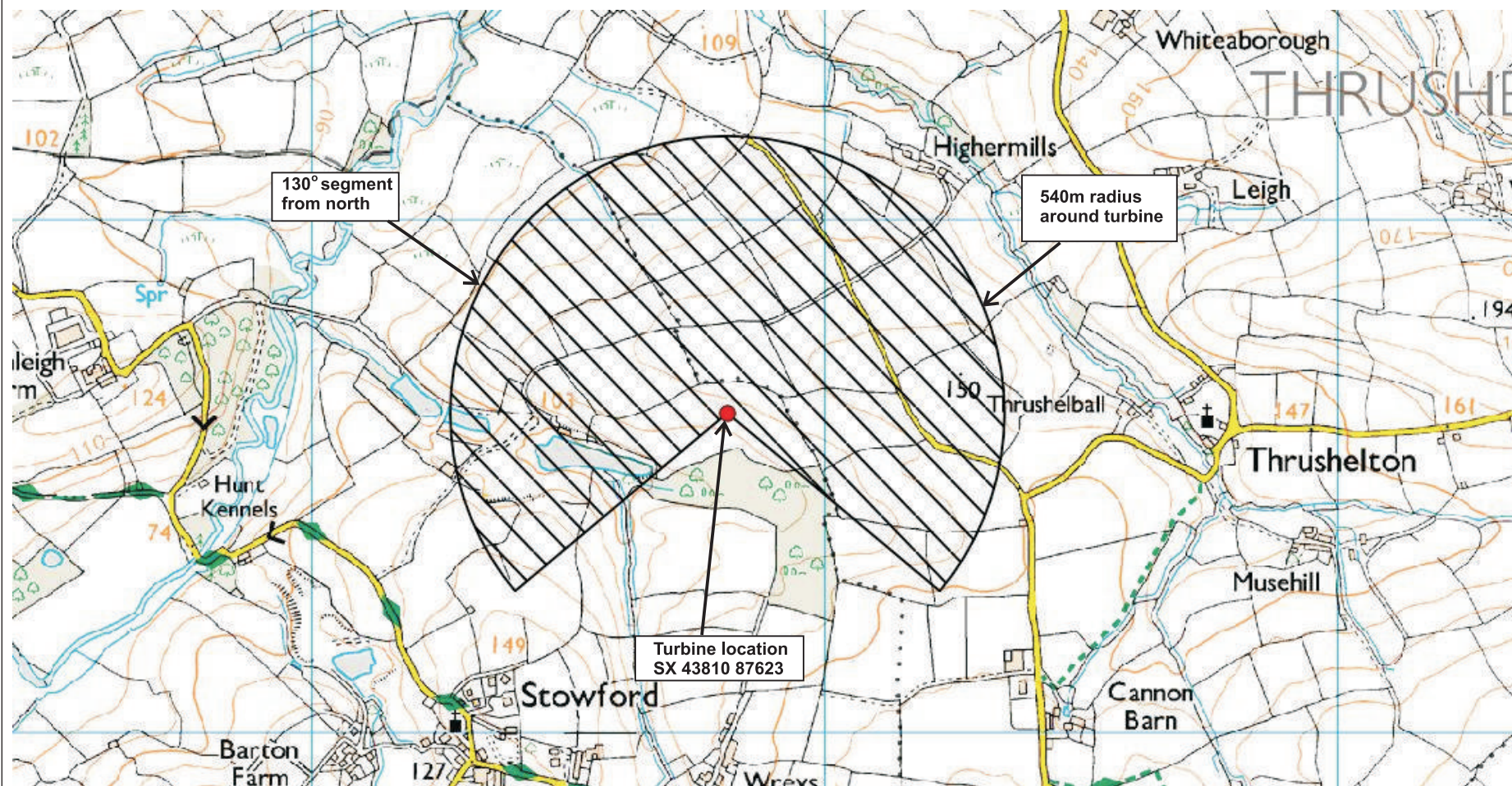
- 6.11 It should be noted that photosensitive epilepsy is a type of epilepsy in which all or almost all, seizures are triggered by flashing or flickering light (natural or artificial). However, people with this condition tend to be sensitive to flickering light between 3 - 60 Hertz (Hz)². The frequencies of flicker caused by modern wind turbines (less than 1.5 Hz)³, are well below the threshold frequencies known to trigger photosensitive epilepsy. Therefore, the proposed development is predicted to not cause photosensitive epilepsy in any prone person within the visual influence of the turbine.

² Epilepsy Action (2007), 'Photo-sensitive Epilepsy'. Available online at: (<http://www.epilepsy.org.uk/info/photo.html>).

³ ODPM, (2004) 'Planning for Renewable Energy: A Companion Guide to PPS22', pp. 1

SUMMARY

- 6.12 This chapter of the ES assesses the potential for the proposed development to cause shadow flicker impacts on local residents.
- 6.13 As described by the DECC, shadow flicker “*is the effect caused when an operating turbine is located between the sun and a receptor such as a dwelling.*” DECC describe how the significance of shadow flicker effects are dependent on a number of factors operating in combination, including the location of the relevant building relative to the path of the sun and the turbine.
- 6.14 Properties with the potential to be affected by shadow flicker have been identified by mapping the area around the proposed turbine location within a distance of ten rotor diameters (i.e. EWT 54*500 turbine blade diameter of 54 m x 10 = 540 m) and 130 degrees either side of north (the ‘shadow flicker study area’).
- 6.15 In this way, no properties were found to fall within the shadow flicker study area, as shown in Figure 6.1, with the nearest property 60 m outside the study area. Therefore, it is considered that no shadow flicker effects would be experienced at any property within the vicinity of the turbine.
- 6.16 The proposed development is predicted to not cause photosensitive epilepsy in any prone person within the visual influence of the turbine.



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KEY:

 Shadow Flicker Study Area

Figure 6.1:
Shadow Flicker Study Area

Project Name:
Wreys Barton Farm
Wind Turbine EIA

Client:
Murex Energy

Project Number:
RMA-C1343

Date:
6th January 2015

Drawn by:
RMA Environmental/DM