CHECKLEY WOOD

WIND TURBINE

APPLICATION CB/16/01389/FULL

OBJECTION DOCUMENT

INTRODUCTION

Bedfordshire is graced with some of the most picturesque and unspoilt countryside anywhere in Great Britain and the area between Woburn and the Buckinghamshire boundary is no exception. Wantonly defacing such natural beauty would be nothing short of criminal, even if the glaring failures in the planning case didn't exist.

It is initially important to understand that this Application for a second wind turbine MUST be considered in combination with the existing turbine. It is obvious that the Applicant wishes us to make decisions at the margin and consider one turbine, but **the impact is of the 2 turbines combined**. It is for that very reason they wish to separate them.

In essence, this development, if allowed, creates a wind farm of such a size and scale that it is an unacceptable development on the site proposed within the Green Belt. There are many material planning considerations which warrant refusal in the light of the harm caused and the impossibility of mitigation.

CBC has a public duty to weigh this evidence. The right of decision rests entirely with CBC as the democratically elected and accountable local government of our area.

Both the NPPF and the Localism Act mandate local authorities to attach great weight to the considered views of local people. As the Prime Minister put it: *"We're cutting the subsidy to onshore wind because I think it has been over-subsidised and wasteful of public money. The second thing we're doing is the Localism Act will give local communities a greater say over issues like wind turbines"* (Hansard: 29 February 2012). His sentiments have since been echoed in widely reported statements from respective Ministers of State for Energy, Environment and Planning.

Many wind farm developers have tried to argue that national Energy Policy trumps every other planning consideration. This is a misrepresentation of the truth. Moreover it is one that has been rejected in the High Court by its ruling that the planning process in the UK remains "**plan-led**, that **the Local Development Plan is not subordinated by National Policy**, and that it, therefore, remains the primary instrument for determination of such Applications.

The following Chapters consider in detail the impact this proposed development will have on our landscape, Heritage assets, ecology, homes, pastimes and Public Health.

We conclude that the evidence provided shows that the significant degree of harm inflicted on all of these assets, by the proposed development, results in the amount of dis-benefit exceeding that of the benefit.

Further, we only have so much capacity (in terms of money, space and impact) to build the structures necessary to transfer the energy we require into the form we need. Consequentially, that capacity is a scarce resource which needs to be efficiently and effectively managed.

If you consider that our total energy requirements are relatively fixed, then in managing the scarce resource, we must ensure the maximum energy production from each unit of capacity consumed.

This means, in practice, locating our wind turbines on optimally selected sites, not sites selected because they are simply owned or available.

To do otherwise would be unrenewable, unsustainable and unjust.

We ask for your determination of refusal.

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1. QUANTUM OF ELECTRICITY PRODUCTION

We recognise that Central Bedfordshire Council ("CBC") is constrained by National Policy directives from debating the viability and value of onshore wind policy per se, or the specific electricity output to be achieved by a particular wind farm. However, this does not absolve CBC from rigorously scrutinising the details of all evidence submitted, including that pertaining to the quantum of energy production. The LPA still has a legal duty to scrutinise thoroughly the veracity of the Applicant's Application, irrespective of the national directive that it cannot discuss policy.

Since electricity generation is the only benefit proposed by the Applicant, it follows that its quantum must be accurately established as the basis for then evaluating the balance between benefit and dis-benefit in this determination. This is not only permitted by National Policy, it is mandated by it.

The comparison of benefit against dis-benefit was highlighted very recently by Hugh McNeal (CEO of Renewables UK, wind industries trade body). In an article published in The Telegraph (4 June 2016) Mr McNeal states *"we are almost certainly not talking about the possibility of new plants in England. The project economics wouldn't work; the wind speeds don't allow for it"* and concludes that new wind farms in England were *"very unlikely"* beyond those that have already secured subsidies and are awaiting construction as they would not be cost efficient enough.

These comments were supported by Keith Anderson, Chief Executive of Scottish Power Renewables, who said he agreed with Mr McNeal that new onshore wind in England would be *"incredibly challenging"*.

These comments highlight very clearly that the industry itself is questioning the amount of benefit produced in sub-optimal locations. However, in reaching their conclusions they are only focusing on the economics and not including the other dis-benefits of building massive wind turbines amongst local communities. These other dis-benefits are highlighted in the remainder of this document.

We contend that once these dis-benefits are added to their comments above, the result is clear that the total dis-benefit far exceeds the quoted benefit.

Furthermore, the turbine will be produced overseas and we understand there will be limited local input into construction work given the specialised nature of the erection of wind turbines.

Wind Speed

The output of electricity from a wind turbine is proportional to the cube of the wind speed. Variations in the available wind speed at any site due to topography, vegetation and built structures will, therefore, make a large difference in electricity generated and hence the benefits that can be claimed. The specific wind profile of a site determines the amount of the installed capacity of the wind farm that can be harvested.

A graphic example of just what difference topography can make is shown by the performance of two similar sized schemes a few kilometres apart near Workington. In 2011 the Siddick wind farm had a capacity factor of 15.9% while the Lowca wind farm achieved 33.8%. The reason was that the Lowca site is on top of a ridge while the Siddick wind farm is on the coastal plain.

Because the power output of a wind turbine is proportional to the cube of the wind speed, the annual energy production decreases disproportionately compared to the decrease in annual average wind speed. For example, a decrease in annual wind speed from 7m/s to 6.5m/s is a 7% decrease, but the corresponding fall in annual energy production is around 14%. This relationship results in 2 conclusions:-

- Wind turbines must be located in the windiest possible (optimal) locations. There is no evidence to suggest that the Applicant has considered other locations and, specifically, measured average wind speeds at these competing locations to assess benefit v dis-benefit.
- Data for wind speeds at 93.5m hub height must be accurately collected and quantified at the Checkley Wood site.

This relationship further enhances the comments by Hugh McNeal and Keith Anderson. We live in a world of scarce resources and it is vital that these scarce resources are used as efficiently as possible. This statement holds for all forms of energy and must include Renewable Energy.

Energy will be consumed and carbon footprints created in building and delivering the massive turbine. Given that we now understand the pure economics to be questionable, it is essential that we position the turbines responsibly and effectively.

We contend that the proposed site of the Checkley Wood wind turbine is sub-optimal. It has been chosen because it is available rather than because it provides the right solution.

National Planning Policy Framework ("NPPF") Requirement

The National Planning Policy Framework states that Applications should be refused where *"any adverse impacts of doing so would significantly and demonstrably outweigh the benefits"*. Thus it is vital that the benefits are accurately quantified to enable this balancing exercise to be effectively carried out.

By choosing a sub-optimal wind speed site, the Applicant has failed to mitigate the adverse impacts, because by selecting a site with higher wind speeds, they could reduce the environmental and social impacts through using smaller turbines to produce the same amount of electricity. The Applicant's position is in direct conflict with national guidance as shown by:

"Our planning system must enable renewable deployment in appropriate places …. While ensuring that we continue to protect our environment and natural heritage and respond to the legitimate concerns of local communities". (UK Renewable Energy Strategy July 2009).

"We are targeting only the most cost effective onshore wind farm deployment". (Ministerial Foreword. Consultation on proposals for the levels of banded support under the Renewables Obligation).

"Support for wind through ROCs is based on generation, not capacity, in order to encourage efficient deployment". (Section 3.7 RO Support. Consultation on proposals for the level of banded support under the Renewables Obligation).

Turbine Wake Separation

The amount of electricity produced is also impacted by the separation distances between the turbines as can be seen in an EON Application at Syderstone (Chiplow Wind Farm). In the ES in 4.1.2 one of the constraints quoted as important to the design of a wind farm was:

"To minimise the turbulent interaction between wind turbines (wake effect), which is a key factor in maximising the overall power generating capacity of a site, turbines were also separated by set distances both in line with the prevailing wind direction and perpendicular to it (in the case of Chiplow, this being 5 x 4 rotor diameters)". This is reinforced by National Policy Statement EN.3 which stated 6 and 4 rotor diameters respectively.

The location of the second turbine does not meet this separation guidance as the developer quotes a separation of 410m with a rotor diameter of 112.5m and hence there will be a reduction in capacity factor due to array losses. The turbine manufacturer will only warrant the performance of the turbines in terms of both efficiency and noise, if they are satisfied that the turbine layout meets its required standards and criteria. There is no evidence from the Applicant that the manufacturer has been approached about the tight layout proposed here.

Quantum of Electricity Generated

The Applicant has estimated that the chosen turbine (Vensys VE112) could produce approximately 8,380,000Kwh of electricity annually. This figure has been calculated by applying a 10% loss factor to the theoretical capacity associated with turbine availability and electrical losses, and by estimating the average wind speed at the hub height of 93.5m.

The accuracy of these figures needs to be independently verified and specific allowance made for:-

- Unscheduled maintenance. The existing Double Arches turbine was not operational for in excess of 5 of the previous 12 months. During that period, no energy was produced.
- Wind speeds at hub height of 93.5m must be accurately compiled.
- The Applicant has confirmed that the cumulative effect of both turbines will result in an exceedance of the noise limits at 3-4m/s at certain locations. The recommended mitigation is that the proposed Checkley Wood turbine is only operated for wind speeds greater than 4.5m/s when the residential properties are down wind of the turbine (when the wind is blowing from the North-East). The impact of this must be accurately measured, specifically in regard to average wind speeds and average direction of prevailing wind and an adjustment calculated for energy production.
- The Applicant has confirmed that 22 properties will suffer the effects of Shadow Flicker, in total over 254 days of the year. The Applicant has confirmed "if effects are observed by the residents, to protect their amenity, control of the turbine would be used to turn the machine off during the brief periods identified where conditions are such that the effect may occur". This can only be above the cut in wind speed of 3m/s and when the rotor is turning. Again, the impact of this on energy production must be accurately quantified.
- The calculation does not include any adjustment for turbine wake separation. We understand that the turbine manufacturer will only warrant the performance of the turbine in terms of both efficiency and noise, if they are satisfied that the turbine layout meets its required standards. The manufacturer must be approached with details of the specific site layout and asked to quantify energy production.

We have approached the turbine manufacturer (Vensys) by phone and email requesting more details of the energy production function and energy consumed by a Vensys VE112. At the date of this report, we have not received a response to our request for further data.

However, we understand that the daily operations of the turbine will consume power. These operations include blade pitch control, stop/start operations, cooling, magnetising the stator and other elements. In accurately calculating the potential benefit achieved, the manufacturer should provide to CBC details of the amount of power utilised by these daily operations such that the true net power capacity is quoted for the benefit.

Furthermore, the VE112 is quoted as having a power capacity of 3 megawatts. As the Applicant clearly states *"the turbine can produce this rated capacity at wind speeds of between 13.0m/s at hub height to its cut-out wind speed"*.

However, the Applicant estimates the average wind speed, at hub height at the proposed Checkley Wood site, to be 6.9m/s. This speed is 46% lower than the quoted capacity wind speed of 13m/s and given the cubic relationship between wind speed and power output, results in a significant impact on actual power capacity.

We have used the REUK (www.reuk.co.uk) wind turbine output calculator with the following variables:

Rotor Diameter: 112m
Cut-in Speed: 3m/s
Cut-out Speed: 25m/s
Turbine Efficiency: 35% (estimation based upon Applicant's figures)
Weibull Shape Parameter: 2 (mean estimation)

In this model, we are unable to use the wind speed of 13m/s and have had to use 12m/s as the closest available. We have therefore adjusted the observed wind speed to 6.4m/s to allow for a direct comparison to the Applicant's figures (13m/s and 6.9m/s).

The model results are:

At 12 m/s the predicted turbine annual output is 47,098,289 Kwh.

At 6.4m/s the predicted turbine annual output is 9,409,335 Kwh.

This model shows that the potential power output falls by 80% by moving from an area with average wind speeds of 13m/s to the chosen wind speeds site of average 6.9m/s.

Clearly, the model we have used is fairly basic, but it is provided by the industry and should therefore be representative of the relative numbers. We would have preferred to use data supplied by the manufacturer, but in the absence of any response have constructed this relatively crude estimation. We recommend that CBC perform a similar calculation using the manufacturer's data.

Another way of understanding this point is that 80% of potential capacity is being wasted due to site selection or, using the Applicant's preferred methodology and accepting that the average household uses 4,473Kwh of electricity per annum, this equates to wasted potential energy sufficient to fuel:

37,688,954 / 4,473

= 8,426 households

Add to this figure the wastage created by the number of times the turbine has to be switched off due to either Shadow Flicker, excess noise or maintenance and the conclusions regarding the management of scarce resources are all too clear.

Conclusions

The cumulative impact of array losses, forced shutdown due to both Shadow Flicker and noise levels, average wind speeds at hub height and maintenance must be accurately quantified and an adjustment made to potential energy production in order to judge the balance of benefit v dis-benefit.

Based upon our (basic) calculations, the chosen site results in a 80% loss of potential energy production from the quoted capacity at 13m/s. In managing the Earth's scarce resources, it is imperative, given the cubic relationship between wind speed and power output, that turbines are located in optimally selected sites.

2. TURBINE WAKE SEPARATION

National Policy Statement EN3 recommended that turbines should be separated by a ratio of 6x4 Rotor Diameter to allow for Turbine Wake Separation. This separation is required to enable the turbines to operate safely and efficiently. The recommended 6 Rotor Diameters have to be in the direction of the prevailing wind and 4 rotor diameters perpendicular to the prevailing wind.

The developer's Application states that the Checkley Wood turbine will be only 410m North East of the original Double Arches turbine. This **DOES NOT** meet the requirements of National Policy Statement EN3.

In Appeal Decision APP/D2510/A/10/2121089 the inspector recorded that:

"It is also to be noted that "Planning for Renewable Energy: A Companion Guide to PS22", provides an illustration of a turbine layout based upon a spacing of 6 rotor diameters in the direction of prevailing wind and 4 rotor diameters across wind."

The Planning Inspector is therefore relying upon 6x4 Rotor diameters separation.

In order to accommodate 6x4 rotor diameters, the siting of the Checkley Wood turbine would have to move further North East, to a point where it would be sited far too close to the A5 trunk road to satisfy the Highways Agency and general public safety requirements.

If the Applicant had followed NPS EN3, the proposed site would have been rejected.

The size of the site simply DOES NOT provide sufficient space for 2 such huge turbines.

The current Application makes reference to the existing wind turbine erected by AWE Renewables ("AWE") in December 2014 at Double Arches Quarry. In the Application for the first turbine (CB/10/03034), the Environmental Statement deals with "the consideration of alternatives". The report explains that consideration was given to two turbines, but concluded that as a result of various constraints, a single turbine was the most appropriate option. The considerations were:-

1. the two turbines would be sited too closely thereby affecting their productivity and also increasing noise levels; and
2. the two turbines would have an unacceptable impact on the Heritage landscape and Heritage assets within the Zone of Visual Influence.

It is evident from the Applicant's own conclusions in 2010 that the impact of turbine wake separation would reduce energy production (decrease the benefit) and increase the dis-benefit.

We have already demonstrated, in the preceding Chapter, that 80% of potential output has been lost due to site selection (average wind speed). It is our understanding that the lack of separation distance between the proposed turbine and the existing Double Arches turbine will create array losses and further depreciate that potential output.

We further understand that the prevailing wind is predominantly from the South/South-West and given the proposed site is North-East of the existing turbine, these array losses are likely to be amplified.

We believe the Checkley Wood site is sub-optimal and has been chosen simply because it is available rather than by determination of optimum resource utilisation and efficiency.

3. HARMFUL IMPACTS ON LANDSCAPE CHARACTER

There can be no doubt that the introduction of industrial rotating turbines 150m high into a landscape will constitute a significant adverse impact on landscape character.

This is especially the case, within a rural area of high landscape value.

The developer states **this second wind turbine** will be the same size as the original turbine at Double Arches. This is evidently NOT the case. We contend that the main visual impact from a wind turbine is that of the rotor which when turning creates a circle within the zone of visual influence. The area of any circle is measured by πr^2. The area occupied in the sky by the Double Arches turbine is 5,942m², **whereas the area occupied by the proposed Checkley Wood turbine will be 9,935m².**

This is an increase of 67%. The original turbine was the largest on land turbine when erected. This proposal is for a rotor size that will dwarf that in comparison. The impact on the landscape character will be immense. They will overlook the SSI's of Kingswood and Bakers Wood, the Greensand Ridge Path, Rushmere Country Park and will have a significant detrimental effect on all.

It should also be noted that **the combined size of the 2 rotors will be 15,877m²** or equivalent to almost 4 acres in area. The impact within the zone of visual influence on the landscape character will have a significant adverse effect.

"Landscape character" means the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape and how these are perceived by people. It reflects particular combinations of geology, land form, soils, vegetation, land use and human settlement. It creates the particular sense of place of different areas of the landscape.

"Landscape capacity" refers to the degree to which a particular landscape character type or area is able to accommodate change without significant effects on its character, or overall change of landscape character type. Capacity is likely to vary according to the type and nature of change being proposed.

CBC's Policy document "Wind Energy Developments in Central Bedfordshire" states

"Cumulative impact relates to the combined impact of wind energy developments"; and

"The balance has to be made as to whether the new proposal will take development beyond the landscape capacity of the location".

The area around where the proposed Checkley Wood wind turbine is to be erected and the wider areas, from which the turbine will be visible, will be affected in both landscape character and landscape capacity.

We contend that the landscape capacity to accommodate change was fully utilised with the development of the Double Arches wind turbine.

Further development of the type proposed here would create an industrial zone within the Green Belt and completely change the landscape's character.

CBC's own Policy document serves to confirm this conclusion where in Section 7.11 it states:

"The Greensand Ridge (West) – a large single turbine (149m) has been permitted at Double Arches Quarry, near Heath and Reach. The extremely tall (149m) turbine permitted at Double Arches Quarry will dominate the local countryside, raising the issue of visual conflict if other more typical turbines are installed within a 10km radius".

To reiterate, this Proposal is not for "a more typical turbine" it is for a turbine with height 150m and rotor area 67% greater and will clearly create a significant visual conflict.

CBC's own policy on wind energy quotes:

Areas requiring the greatest constraint

9.1 The landscape sensitivity study has identified that there are only limited areas of countryside considered appropriate for wind energy development. Landscapes of increasing complexity, but with some potential for wind energy, have been mapped as having moderate sensitivity; these areas still contain constraining factors which would limit the size and scale of development. Areas of greatest constraint are mapped as having High Sensitivity and include The Chilterns Area of Outstanding Natural Beauty (AONB), The Greensand Ridge, River corridors – Ivel, Ouse, Flit and Ousel, Areas of significant cultural heritage, e.g. Parklands, farmland of historic interest and the settings of landmarks or special buildings.

9.2 The smaller scale and complexity of these landscapes is such that vertical features such as turbines would almost invariably be out of character.

9.3 Landscapes that are identified as being more sensitive to change have less capacity to accept wind energy. Sensitivity will vary depending on the location within the character area.

9.4 Tranquil landscapes: Central Bedfordshire is densely populated and has areas undergoing rapid change as a result of growth area pressures for housing and industry. The area has no truly remote countryside and yet there are locations close to the major towns that are appreciated for their tranquillity, are accessible and retain traditional features. It will be vital to conserve these areas from inappropriate development. These are arguably more precious than more extensive tranquil areas associated with open arable land.

The proposed site is classified by CBC as within The Greensand Ridge (West), an area defined above as requiring the greatest constraint and an area that is vital to be conserved from inappropriate development.

Further CBC's retained policies state:

9.9 The landscape Sensitivity Study has identified there are only limited areas of countryside considered appropriate for wind energy without there being a significant loss of character and quality.

9.13 This factor reduces the scope for either a large wind farm in this area or the permission of dispersed single turbines as both scenarios would detract from tranquillity. Central Bedfordshire has experienced a marked loss of tranquillity over recent years, and peaceful countryside with open, uncluttered view is a precious resource.

9.15 The scale of development would be critical to acceptability as would satisfaction that the impacts on other sensitive receptors such as biodiversity and local communities were mitigated to an acceptable level.

We contend that the scale and visual intrusion of the proposed development of a second wind turbine would have a significant adverse impact on landscape character, visual amenity and tranquillity. Maintaining these precious resources is part of CBC's own policies and vital to the amenity value of local residents and tourists to the area.

Finally, within the Application specific "view–point" locations have been selected/used to assess the impact of the proposed development on the landscape character. We feel that the worst affected vantage points have been omitted from this analysis.

For a fair assessment of impact within the zone of visual influence, we believe that the "view-point" locations be increased to include views from:-

- The top of the ridge from Overend Green
- The communities at Potsgrove
- Stockgrove Park

To not include an assessment of the impact on the landscape from these "view-points" will result in a conclusion that bears no resemblance to the real impact.

We request that CBC, in discharge of its responsibilities, to ensure a fair and appropriate assessment on the impact of the landscape character, utilises the resources at its disposal to carry out appropriate "site visits" and assessment of impact. We will provide specific site locations upon your request.

4. DAMAGE TO HERITAGE ASSETS

"I would therefore suggest that in simple terms the insertion of a structure of the proposed size (101.5m!) cannot but have an adverse impact on the setting of the various historic assets in the immediate vicinity; it will not preserve the settings of listed structures … If the definition of setting is widely drawn and a high level of significance is attributed to the nature of the undulating lowland countryside in this part of Aylesbury Vale, then this will be adversely affected by the proposal". AVDC, Historic Buildings Officer. Report on single 101.5m high turbine at Ford and Dinton January 2013.

There would be significant adverse impact on the settings of the local parish churches, the local conservation areas and SSI's and the listed properties contained within the local villages. These are locally important and nationally designated structures and sites. They surround the proposed development site at Checkley Wood.

The adverse impacts are contrary to the general duty under Section 66 of the 1990 Planning (Listed Buildings and Conservation Areas) Act, the Bedfordshire County Plan and Local Development Plans. Consequentially they provide a material planning consideration with no satisfactory mitigation available. CBC should, therefore, refuse this Application on the grounds of its adverse impact on scheduled cultural heritage monuments and their settings.

Both the protection of the setting of Heritage assets and of Conservation Areas are material planning considerations for CBC in determining the impact of development on Heritage assets. This was held to be a material planning consideration sufficient to require refusal of consent in the case of the Ford and Dinton Application for a much smaller (101.5m high) turbine.

We contend that CBC must also uphold these as material planning considerations leading to refusal of consent at Checkley Wood where the combined size of the existing and proposed 150m high turbine will impact directly on the setting of the area's designated churches, conservation areas and other listed buildings.

We submit that <u>2 wind turbines</u> of <u>up to 150m height with a maximum 112.5m diameter rotating blade</u> will represent an unprecedented visual intrusion in the area with major adverse <u>impacts up to at least 10km and beyond.</u> By any definition this must self-evidently affect the setting of these designated assets.

The designated assets include:

Church of Saint Peter and All Saints, Battlesden (Grade I)
The Church of Saint Mary the Virgin, Potsgrove (Grade II*)
The Church of All Saints, Soulbury (Grade II)
The Church of St Leonards, Heath & Reach (Grade II)

Furthermore, the proposed wind turbine will have a harmful effect on the natural beauty of the rural landscape in this area and on the setting of the regional and local footpaths and bridleways which are in close proximity to the proposed wind turbine**.**

The significant harm caused to these Heritage assets that have been present for centuries is NOT outweighed by the benefit claimed.

5. DAMAGE TO BIODIVERSITY, ECOLOGY AND THE ENVIRONMENT

"Wind energy is NOT green: It destroys the landscape, it chops up birds, it chops up Bats". Professor David Bellamy.

"My concerns are many; however as a long term ornithologist I have noted the loss of many different birds since the implementation of the Double Arches turbine. Amongst others this has included the Buzzard pair, which had been nesting in Kings Wood for about 12 years, the Red Kites which started to regularly hunt around the area including the reserve and sandpits, Sand Martins that would engulf the fields beyond the house in their multitudes, now maybe 5 or 10 at most, the flocks of ducks, geese and swans that would fly during the morning and evening, the owl that utilised our fir tree many nights hunting over the field and, finally, the bats which we would watch in the evening flying around our garden and buzzing close over the decking ….. all gone". Resident of Sandhouse Cottages, June 2016.

The environmental impacts are literally a question of survival for the varied species of wildlife to be found at, or in close proximity to, Checkley Wood and the SSSI's/NNR that surround it.

Wanton destruction of our precious and highly protected ecology is simply unacceptable.

The Site of Special Scientific Interest (SSSI), Kings Wood is only 900m from the proposed turbine site and closer when allowing for the 112.5m rotor diameter.

Kings Wood is also classified as a National Nature Reserve ("NNR"). The grand flora includes a large number of species which are uncommon or rare in the Country. The lowland heath and acidic grassland represents a habitat that now has a very limited distribution, both in Bedfordshire and over its natural range in Southern Britain.

Kings Wood and Rushmere Park are home to many species of bat (including the nationally rare Barbastelle Bat), Red Kites (2016 may have seen a mating pair in the area for the first time), Buzzards, Badgers and Great Crested Newts.

Many of these species are afforded the highest degree of legal protection under Schedule 1 of The Wildlife and Countryside Act 1981.

"It is an offence to take, injure or kill Red Kite, or to take, damage or destroy its nest, eggs or young. It is also an offence to intentionally or recklessly disturb the birds close to their nest during the breeding season. Violation of the law can attract fines up to £5,000 per offence and/or a prison sentence of up to 6 months."

There is published data on the carnage that wind turbines cause for Bat and avarian populations. This is drawn from an authoritative study published in The Spectator. The data comes from actual field studies and the indisputable evidence of body parts of dead bats and birds found beneath turbines.

Bats

All bats are protected under Schedule 5 of The Wildlife and Countryside Act 1981 (as amended) and included on Schedule 2 of The Conservation of Habitats and Species Regulations 2010. These include provisions making it an offence:-

- Deliberately to kill, injure or take (capture) bats;
- Deliberately to disturb bats in such a way as to be likely-
  - (a) to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or to hibernate; or
  - (b) to affect significantly the local distribution or abundance of the species concerned
- To damage or destroy any breeding or resting place used by bats;
- Intentionally or recklessly to obstruct access to any place used by bats for shelter or protection (even if bats are not in residence).

The words deliberately and intentionally include actions where a Court can infer that the defendant knew that the action taken would almost inevitably result in an offence, even if that were not the primary purpose of the act.

The offence of damaging or destroying a breeding site or resting place (which can be interpreted as making it worse for the bat), is an absolute offence. Such actions do not have to be deliberate for an offence to be committed.

Certain species of bat are listed on Annex II of the EC Habitats Directive (92/43/EEC). Areas of particular importance for these species can be designated as Special Areas of Conservation (SACS) under the Directive. This list includes the Barbastelle Bat (Barbastella barbastellus).

The Barbastelle Bat is resident in the area as identified by the Applicant's own survey results.

A radio tracking exercise for Barbastelles, centred on Kings Wood, was undertaken by Bedfordshire Bat Group in 2005. Three such bats were tagged as part of the study and recorded activity was found to be principally to the North and West of Kings Wood.

Bedfordshire Bat Group clarified that the three tagged bats all flew roughly South, each following slightly different flight lines. Notwithstanding the fact that small numbers of bats were tracked, this work is nevertheless significant in that it demonstrates that this Nationally rare species is active in the locality.

The maximum mean distance travelled by these three bats and two other bats observed in 2003 and 2004 was approximately 5km from their roosts. The maximum distance from a roost was recorded as 6.3km. Kings Wood is approximately only 0.87km to the North of the proposed turbine location, so this information is extremely relevant to the understanding of bat movements in the locality.

The conclusions must be that the nationally rare Barbastelle Bat, will be at times, using the Checkley Wood site for foraging and according to the Directive, the area should be given consideration for designation as a Special Area of Conservation.

Finally, the Applicant's report has been produced by Ecology Solutions. We can find no evidence of a review and independent assessment of the impact of the proposed development on the local bat population.

We believe that CBC, in discharge of their duties of protecting bats and, in particular, those on the EC Habitats Directive, MUST request that the Bedfordshire Bat Group provide an independent assessment of the local bat population, its movements and impact of the proposed development.

Birds

All birds, their nests and eggs are protected under The Wildlife and Countryside Act 1981 (as amended). It is an offence to:-

- Kill, injure or take any wild bird intentionally;
- Take, damage or destroy the nest of any wild bird while that nest is in use or being built; or
- Take or destroy an egg of any wild bird.

For certain bird species listed on Schedule 1 of The Wildlife and Countryside Act 1981, it is an offence to intentionally or recklessly disturb any wild bird listed on the Schedule while it is nesting, or is at (or near) a nest with eggs or young, or disturb the dependent young of such a bird.

The report from Ecology Solutions, presented by the Applicant, notes that a Buzzard's nest is present in the South Eastern area of the copse on the site. No greater evidence can be provided that this site is being used by species on Schedule 1 that it is CBC's responsibility to protect.

Red Kites have recently moved into the area and as noted by Ecology Solutions use the site for foraging. A pair of Red Kites have been present in the Stockgrove area throughout this year's breeding season and we therefore have good reason to believe they have nested in the vicinity or will shortly do so. These birds are afforded the highest degree of legal protection and given their foraging habits, will be particularly at risk from the proposed development.

Nightjars and Owls are certainly present in the Kings Wood SSSI, only 900m North West of the proposed site.

CBC's own retained policies state that the impact of a wind turbine on bats and birds can be significant depending upon the proposed location. Specifically Section 13.15 quotes

"To minimise risk to bat populations, Natural England advice is to maintain a 50m buffer around any feature (trees, hedges) into which no part of the turbine should intrude. This 50m buffer should be measured from the rotor swept area (not the hub/base of the turbine) to the nearest point of the habitat feature."

For the proposed Checkley Wood turbine, this buffer zone would equate to roughly 106.25m from the base of the turbine (50m plus 56.25m less allowance for the angle to the ground).

Ecology Solutions states that *"the adjusted position of the turbine is some 80m from the hedgerow to the West and at least 71m from the hedgerow to the South East …..".*

We contend that neither distance meets the requirements of both Natural England and CBC's own policies and, we can therefore conclude, that the siting of the turbine is in direct contravention of these requirements.

The only possible solution is to move the location of the turbine, but as we know, due to the presence of the copse, the A5 and the existing Double Arches turbine, this is NOT possible without further compromising safety, noise or environmental amenity.

Furthermore, the protection of the local wildlife, ecology and biodiversity are key elements of CBC policies. Section 13.9 of CBC's own policies states:

"The National Policy Statement for Renewable Energy Infrastructure (EN-3) highlights that there is the potential for rotating blades of a wind turbine to strike birds and adversely affect bats resulting in death or injury.

Where appropriate, planning permission will not be granted for development that fails to enhance or create wildlife habitats or sites of geological interest. The Council will refuse planning permission for proposals that would result in harm to designated or proposed Sites of Special Scientific Interest (SSSI) or National Nature Reserves (NNR), unless the reasons for the development clearly outweigh the nature conservation value of the site and the National Policy to safeguard such sites. Where such development is permitted, measures will be required to mitigate or compensate for the effects of the development."

We contend that with a separation distance of only 900m from the Kings Wood SSSI/NNR, the proposed development of a 150m high structure, with a 9,935m rotating turbine area, in conjunction with the existing 5,942m area of the Double Arches turbine, will harm the designated SSSI/NNR. That being said, this development could only be approved if CBC are able to clearly demonstrate that the reasons for the development outweigh the nature conservation value.

We contend that by any metric, this is NOT achievable.

6. HARMFUL IMPACTS ON RESIDENTIAL AMENITY

A further impact of the visual intrusion of this turbine (in conjunction with the original turbine) will be on the residential amenity of people living in close proximity to the site. In Planning Law, there is no right to a private view. However, at a Public Enquiry at North Downer the Inspector David Lavender established an important principle, now known as the "Lavender Effect" test when he said:

"When turbines are present in such number, size and proximity that they represent an unpleasantly overwhelming and unavoidable presence in main views from a house or garden, there is every likelihood that the property concerned would come to be regarded as an unattractive, and thus unsatisfactory (but not necessarily uninhabitable), place in which to live. It is not in the public interest to create such living conditions where they did not exist before".

In other words the issue is not whether the properties become "unliveable", but whether they become significantly less attractive places to live. As we will show, this is undeniably the case in this Application.

This was reinforced in an Inquiry for the Wadlow wind farm where the Inspector quoted, almost verbatim, the same statement from David Lavender in confirming his decision for refusal.

This *'Lavender Test'* has become accepted in Planning Appeals as the criterion against which to judge whether the loss of residential amenity in a given case can become determinative in a planning Application for a wind farm. We argue that this is undeniably the case here.

There are 3 groups of houses that are so seriously, adversely affected such that many of them would come to be regarded as an unattractive and, thus, unsatisfactory place in which to live. The Applicant provides a list of settlements within 4km of the proposed site and does admit that there will be a significant effect on the visual amenity of certain residents of some properties in Great Brickhill.

Conspicuously, the Applicant fails to mention the settlements of Potsgrove, Overend and properties on Sandhurst Lane/A5. The properties within these settlements will suffer the greatest visual impacts and yet they fail to receive any consideration.

Below we list the properties affected and the combined impact on them of the Double Arches and Checkley Wood wind turbines.

POTSGROVE

The settlement of Potsgrove was first recorded in the Doomsday Book of 1086. It now comprises 8 homes that sit approximately 150m above sea level, some 50m above the base of the proposed turbine. The settlement lies approximately 1200m to the East of the proposed development site and sits upon a ridge, with the majority of houses sited along the road at a height substantially above the base of the proposed turbine. If this development were permitted, the topography would result in the properties facing directly into the **COMBINED EFFECT OF THE EXISTING DOUBLE ARCHES WIND TURBINE AND THE PROPOSED CHECKLEY WOOD TURBINE, OCCUPYING ALMOST 16,000M² OF SKYLINE.** The impact can only be truly assessed by standing in the gardens of the affected properties. Looking West and South West the entirety of the field of visual influence will be that of the 2 rotating turbines. By any objective assessment of visual impact, these properties will come to be regarded as an unattractive and thus unsatisfactory place in which to live and will **FAIL THE 'LAVENDER TEST'.**

The houses affected are:

Hill Farm
Hill Farm Cottage
The School House
The Old School
Two Farm Cottages

And from the North side of the lane:

Manor Farm
The Coach House
The Old Rectory

WE STRONGLY REQUEST THAT REPRESENTATIVES OF THE APPLICANT AND CBC OFFICERS AND COUNCILLORS VISIT THIS SITE AND ATTEND:

MR K OCHILTREE & MISS S WADD
THE OLD SCHOOL
25 THE VILLAGE
POTSGROVE
WOBURN MK17 9HG
[redacted]

TO ENABLE THEM TO RECOGNISE THE IMPACTS OF THIS PROPOSAL ON THE RESIDENTIAL AMENITY OF THE AFFECTED PROPERTIES.

Sandhouse Lane/A5

As for Potsgrove, the properties on the corner of Sandhouse Lane and the A5 are not mentioned. The properties are located approximately 700m to the North of the proposed development site. The properties are situated at roughly the same sea level as the base of the proposed turbine. The view from the rear garden, being the only one available to these properties will be that of the 2 combined Double Arches and Checkley Wood wind turbines. The vista will be that of both the turbine columns and almost 16,000m² of rotating turbine blade. By any objective assessment of visual impact, these properties will come to be regarded as an unattractive and thus unsatisfactory place in which to live and will **FAIL THE 'LAVENDER TEST'.**

The properties affected are:

1-7 Sandhouse Cottages
The Sandhouse Cottage
Sandhouse Cottage
Trellis Cottage
The Cottage

WE STRONGLY REQUEST THAT REPRESENTATIVES OF THE APPLICANT AND CBC OFFICERS AND COUNCILLORS VISIT THIS SITE AND ATTEND:

Mr P Brackenbury
The Cottage
Watling Street
LU7 9RA
[redacted]

TO ENABLE THEM TO RECOGNISE THE IMPACTS OF THIS PROPOSAL ON THE RESIDENTIAL AMENITY OF THE AFFECTED PROPERTIES.

Overend Green

The settlement of Overend Green sits on the ridge opposite Potsgrove to the South West of the proposed development site. Similar to Potsgrove, it sits at an altitude of approximately 150m above sea level and is only approximately 400m from the Double Arches site and 900m from the proposed Checkley Wood site. Once again, the Applicant fails to mention any visual impact on the properties located in this settlement. Consistent with Potsgrove, the affected properties sit along the ridge line with views into the valley below. That valley, if this Application is not refused, will be entirely dominated at site level by the presence of 16,000m² of rotating turbine blade. By any objective assessment of visual impact, these properties will come to be regarded as an unattractive and thus unsatisfactory place in which to live and will **FAIL THE 'LAVENDER TEST'.**

The properties affected are:

Overend Green House
Corn Mill Barn
Heatheredge
Overend Green Farm
Bethany

WE STRONGLY REQUEST THAT REPRESENTATIVES OF THE APPLICANT AND CBC OFFICERS AND COUNCILLORS VISIT THIS SITE AND ATTEND:

MR J ADAMS
HEATHEREDGE
OVEREND GREEN
HEATH AND REACH LU7 9LD

TO ENABLE THEM TO RECOGNISE THE IMPACTS OF THIS PROPOSAL ON THE RESIDENTIAL AMENITY OF THE AFFECTED PROPERTIES.

The visual impacts on all of the above mentioned properties are significantly magnified due to the fact that the Applicant is attempting to erect a turbine of such massive size that it is far too large for the site and is situated far too close to the existing Double Arches turbine in contravention of National Policy Recommendation.

The resulting impact for the aforementioned properties is of a continual vista of rotating turbine blade, further amplified by the relative height differences of 2 of the settlements to the proposed turbine base.

We contend that the properties noted will fail the 'Lavender Test' and that there are more on which the impact will be wholly unacceptable.

Additionally, the Applicant dismisses the impact on Stockgrove Park. The Applicant quotes Stockgrove Park House as being "a school". The school closed in 1995 and since then the house has been separated into 7 Grade II listed dwellings. The visual amenity of Stockgrove Park residents will be significantly, adversely affected by the combined impact of 16,000m² of rotating turbine blade directly in the line of sight when looking North East, across Stockgrove Park.

Finally, there is now substantial case evidence from the Appeal Tribunals of The Valuation Office Agency (VOA) that the value of houses located in proximity to wind farm developments are devalued by up to 25%. Rulings from such appeal proceedings are available on line.

In summary, we believe numerous houses fail the ***'LAVENDER TEST'*** and contend that there are more on which the impact will be wholly unacceptable. These are material planning considerations, they cause real harm, they cannot be properly mitigated and there is NO benefit here which can possibly be held to outweigh this damage.

7. HARMFUL IMPACTS ON RECREATIONAL AMENITY

The enjoyment of the unspoilt countryside is one of the key amenities available to both local residents and visitors alike. It is also a vital income generator for a number of local businesses and clubs. The removal of this enjoyment through the visual intrusion of a 150m high industrial development is an adverse impact on people's quality of life which CBC is pledged to prevent.

Significant visual impacts on the users of the countryside will occur up to 5km distance.

It is sometimes claimed by developers that people will have different views on how wind turbines will affect their ability to enjoy the countryside. This point was considered by an inspector in this decision for a wind farm near Oundle:

"Some would choose to view the turbines at close quarters and for them the Public Rights of Way would have considerable attraction. But that would not be so for local people who would be only too familiar with the turbines and would have lost the benefit of a rural tranquil network. Overall the proposed wind farm would have an adverse impact on the users of nearby Rights of Way".

CBC's Policy document "Wind Energy Development in Central Bedfordshire" Section 2.12 states:

- *The need for renewable energy, does not automatically override environmental protections and the planning concerns of local communities;*
- *Decisions should take into account the cumulative impact of wind turbines and properly reflect the increasing impact on (a) the landscape and (b) local amenity as the number of turbines in the area increases;*
- *Local topography should be a factor in assessing whether wind turbines have a damaging impact on the landscape;*
- *Greater care should be taken to ensure Heritage assets are conserved in a manner appropriate to their significance, including the impact of proposals on views important to their setting.*

The proposed 150m high turbine, in conjunction with the existing Double Arches turbine will be clearly visible from many public Rights of Way, including the Greensand Ridge Walk. The Greensand Ridge Walk is engaged by local residents and brings many visitors to the area each year. The Applicant notes that significant effects of the proposed development would be incurred by part of the wooded Greensand Ridge LCT.

CBC has identified The Greensand Ridge as highly sensitive and as an area requiring the greatest constraint.

That "constraint" would not be met by the significant effects of this proposed development.

The two turbines will also be clearly visible from public footpaths 1 and 2 in Heath and Reach, footpaths 3, 4 and 7 in Potsgrove and footpath 1 in Battlesden, clearly impacting the recreational amenity of using these routes.

Rushmere Park is also an important resource for local residents and attracts significant number of visitors. Again the view from the Stockgrove ridge will be particularly blighted by the combined effect of the turbines.

Of particular impact will be Jones Pit Fishing Lake owned by RK Leisure (a company that only recently commenced business). The proposed site of the turbine will be only 200m from the location of the property and the noise and visual impact of the turbine will have such a massive impact on the enjoyment of the facilities as to make the recreational enjoyment null and void.

Finally the village of Heath and Reach's Sports Ground, which is enjoyed by so many of the local residents will suffer a severe adverse effect. The Grounds (which host football, cricket, tennis, basketball and other events) will be immediately under the shadow of the combined turbines. The recreational enjoyment of the users of this community space will be substantially impaired by the presence of 16,000m² of rotating turbine blade appearing to be immediately overhead.

CBC has an obligation to protect both the countryside and the community owned recreational spaces**. This development is in direct conflict with that obligation and on that basis will clearly cause harm that cannot be mitigated.**

8. HARMFUL IMPACTS FROM TURBINE NOISE

"Excessive noise is harmful to human health, particularly through adverse affects on sleep". WHO 2011, Burden of Disease from Environmental Noise.

Regulation of wind turbine noise is recognised as necessary to prevent adverse affects on the human population.

The assessment of noise and the harmful impacts on human health from wind farms are both complex and highly technical subjects.

ETSU-R-97

The Government realised early in the development of onshore wind that if the noise output was assessed under the existing methodology for industrial development (BS4142) which limits noise output to 5dB above background then, because most wind turbine sites were in rural locations with low background noise, it would mean that most wind farms would be refused. **Therefore they introduced a specific methodology – ETSU-R-97 – for assessment of noise from wind farms in 1997 which we contend is now seriously out-of-date.**

The compromise ETSU has adopted between not constraining onshore wind farm development and protecting the amenity of local residents means that it has adopted significantly less stringent noise requirements than are in place for other industrial developments.

ETSU states in its Executive Summary *"this document describes a framework for the measurement of wind farm noise and gives indicative noise levels 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 is reasonable to infer, therefore, that the authors' had no certainty that their recommendations were adequate nor were they solely concerned with protecting the sleep and health of wind farm neighbours and, therefore, moderated their recommendations accordingly.

The acoustical shortcomings of ETSU have been discussed in detail in several publications (Bowdler 2005 and Cox, Unwin, Sherman 2012 are examples). Despite the growing evidence of harm and the authors' caveats, no substantive review of the fundamental principles of ETSU has been conducted nor has any substantive research been conducted in the UK. The Hayes McKenzie Partnership conducted a small study on behalf of The DTI in 2006 as result of which they recommended reductions in night-time noise levels. These were removed from the final report, only emerging after the earlier drafts were obtained using Freedom of Information Requests (DTI 2006, The Measurement of Low Frequency Noise at 3 UK Wind Farms plus draft reports 2006 A,B,C).

Even after considering the potential shortcomings of ETSU-R-97, the Noise Impact Assessment provided by Hayes McKenzie contains many estimations/approximations. These may be summarised as:

1. In May 2013 the Institute of Acoustics ("IOA") published "A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise". This was subsequently endorsed by The Secretary of State for Energy and Climate Change.

   Within the document, additional guidance is provided on noise prediction and a preferred methodology for dealing with wind shear.

   Wind shear is the rate at which wind speed increases with height above ground level. This has particular significance to wind turbine noise assessment where background noise measurements are referenced to measurements of wind speed at 10m height which is suggested as appropriate by ETSU-R-97, but which is not representative of wind at hub height, which is what affects the noise generated by the wind turbine.

   The preferred method of accounting for wind shear in noise assessments is by referencing background noise measurements to hub height wind speed.

   The Applicant's noise impact assessment states *"It is understood that the baseline noise survey to derive the noise limits in the Planning Conditions for the Double Arches wind turbine refers to a wind speed measurement height of 10m. In absence of hub height wind speed data, the GPG suggests a simplified method (Section 4.5 Wind Shear, Paragraph 4.5.4), which consists of subtracting a fixed value of 3m/s from the wind turbine's wind speed reference for hub heights greater than 60m. This results in moving the predicted wind turbine noise levels to the left along the x axis (wind speed) by 3m/s."*

   The Applicant has been able to calculate the average wind speed at hub height within the Energy Production section at 6.9m/s. Furthermore, the adjustment made is for hub heights above 60m. It is clearly open to question whether a further adjustment is necessary when the actual hub height is 93.5m or 50% higher.

   Greater accuracy is required to fully assess the impact of wind shear on the turbine noise output.

2. The “predicted” noise levels assume that the wind turbine noise contains no audible tones. The ETSU-R-97 noise limits require a tonal correction to be applied to any derived turbine noise levels resulting from noise measurements of the operational turbine which depends upon the amount by which the tone exceeds the audibility threshold.

   We can see no evidence that the manufacturer of the turbine has been approached regarding audible tones and that such a tonal correction is not required. CBC must ensure that any required tonal adjustment is made to the noise assessment figures.

3. Acoustic performance measurements have been taken from a turbine with hub height of 140m. Performance measurements must be taken from the actual turbine proposed with hub height 93.5m and not estimated.

4. Measured sound power levels were provided for Vensys 2.5mw turbine and not the 3mw turbine proposed in the Application.

5. Noise limits applied to the nearest residential properties to the proposed wind turbine are taken from Planning Condition 10 within Planning Permission CB/14/04463/VOC (Double Arches wind turbine).

   CBC appointed MAS Environmental to review these noise conditions. Their Report was presented to CBC in February 2015. It is our understanding that the Report identifies concerns in how background noise levels were measured, the impact of wind shear and whether wind speeds were measured or standardised. Given the significant potential increase in noise from this subsequent proposal, these concerns now need further review and consideration.

Given the uncertainties inherent within the above estimations, it is vital that CBC in discharge of their responsibility to protect Public Health, commission MAS or other suitably qualified body to prepare an independent Noise Impact Assessment.

We would add that since this is a matter of Public Health, such a report should err on the side of caution.

Excess Noise Levels

Most importantly, even after the previous assumptions and potential omissions, the conclusion of the Noise Impact Assessment is that noise levels **will be in excess of adopted noise limits at H14-H17, H18 and H19 during daytime hours where the cumulative effect of both wind turbines would result in an exceedance of the noise limits at 3-4m/s wind speeds.**

The Noise Impact Assessment suggests ***"Checkley Wood wind turbine is therefore only operated for wind speeds greater than (measured) 4.5m/s when the residential properties are downwind of the wind turbine (i.e. when the wind is blowing from the North East)".***

The impact of this is to reduce energy production and, therefore, the amount of benefit.

In the original Application for the Double Arches turbine (CB/10/03034), the Applicant concluded that *"two turbines would be sited too closely thereby …… increasing noise levels".*

This assessment has merely served to confirm this and that the conclusions reached in 2010 were correct ….. The optimal solution was for 1 large turbine …… We already have that solution and it is therefore clear that CBC must agree with both this paper and the Applicant's original planning approval (CB/10/03034) and refuse permission.

Amplitude Modulation

Wind turbine noise emissions are amplitude modulated ("AM") as the turbine blades pass the tower and pass through areas of differing wind speeds. The effect may be increased if there is interaction between the emissions from nearby turbines (in this case the existing Double Arches turbine at only 410m distance), and from the diameter of the rotor (in this case 112.5m). The result is an impulsive noise character often described as "thumping" or "rumbling". The degree of AM varies with a number of factors including wind speed and direction and blade configuration. Especially prominent modulation is deemed to be excessive amplitude modulation ("EAM").

ETSU-R-97 makes some allowance for AM (3dB peak to trough) in the near field, but makes no allowance for far field modulation nor for lower frequency noise content.

Chris Heaton-Harris MP is sponsoring the Independent Noise Working Group ("INWG") to produce a Wind Turbine Amplitude Modulation ("AM") and Planning Control Study.

The initial reporting phase of the work is now available and the findings have been presented to the Minister of State at The Department of Energy and Climate Change ("DECC") in October 2015. The Report was well received by the Minister who stated:

"DECC has recognised that Amplitude Modulation noise produced by wind turbines can be a cause of concern for some residents. DECC has appointed an external consultant to review the available evidence on AM with a view to recommending how excessive AM might be controlled through a planning condition. The INWG's study will be considered alongside other evidence that is being gathered as part of that review".

The INWG have now published their research and contend some dramatic and disturbing findings. These have been published and are summarised by the INWG as:

1. Excessive Amplitude Modulation (EAM) is a Significant Factor. Noise complaints from wind farms are primarily related to a phenomenon called Amplitude Modulation (AM). This is commonly described as a 'whoomp', 'swish' or 'beating' type noise. It is the character of the noise that tends to make AM wind farm noise most intrusive. A recent Scottish study found that at 1-2km from the wind farm, 72% of those suffering audible noise strongly disliked the noise. When it becomes intrusive to people we call it EAM, or Excessive Amplitude Modulation. These noise components are not covered by the ETSU guidelines and we know of only one wind farm planning decision in the UK where a planning condition has been imposed for AM noise (Den Brook, Devon).

2. There Have Been Decades of Deception. The wind industry has consistently denied the existence of EAM. Our research shows show that EAM is a frequent occurrence potentially affecting all industrial wind turbines, often for long periods of time and most frequently during the night time. A 2014 survey of Local Planning Authorities (LPAs), completed by Chris Heaton-Harris MP (Conservative, Daventry) and analysed by the INWG, shows that not only are incidents of EAM more frequent than the wind industry hitherto has claimed, the progress in resolving them is inconclusive and there are inconsistent approaches to dealing with it across the country. LPAs in the survey call for guidance on measuring and testing for EAM as well as nationally agreed standards that are consistently applied and provide effective mitigations for it. There is also anecdotal evidence of a 'silent majority' who suffer in silence without knowing how to complain, not wanting to get 'involved' or because of a fear of adverse implications; if, for example, they had to disclose any complaint should they wish to sell their house.

3. Existing Legal Remedies are Found Wanting. We have found that the remedies available for wind farm neighbours affected by turbine noise are not fit for purpose. Statutory Nuisance has been actively advocated by the wind industry and supported by Planning Inspectors. Evidence however suggests that an Abatement Notice is not an effective control to protect nearby residents from EAM. Others such as private nuisance and similar legal actions have been considered but these place too much risk and burden on residents for a problem not of their making with likely long term adverse financial implications. In addition, there has been a recent trend of secondary operators forming individual shell companies for each wind farm. The impact of this was highlighted in July 2015 when David Davis MP (Conservative, Haltemprice and Howden) introduced a Bill in Parliament with the purpose of requiring wind farm developers to obtain public liability insurance for any nuisance that they may cause to nearby residents. In particular this is aimed at noise nuisance. One of his constituents had a problem with noise from a local wind farm but had found it impossible to sue because the wind farm operator was purely a shell company with very limited assets.

   Wind Turbine Noise Adversely Affects Sleep and Health. It is abundantly clear from the evidence examined by a world renowned expert in sleep medicine working with the INWG that wind turbine noise adversely affects sleep and health at the setback distances and noise levels permitted by ETSU. There is no reliable evidence that wind turbines are safe at these distances and noise levels, not a single study. In contrast there is an increasing volume of studies and evidence outlined to the contrary. There is particular concern for the health of children exposed to excessive wind turbine noise. The inadequate consideration of EAM is a major factor in the failure of ETSU to protect the human population. The denial of this by the wind industry is reminiscent of other health issues in the past. For example, the tobacco industry and the adverse effects of cigarette smoking.

4. ESTU is Not Fit for Purpose. We show irrefutable evidence to discredit wind industry and government claims that ETSU provides a robust noise assessment methodology. This conclusion is supported by the recent Northern Ireland Assembly report, January 2015, into wind energy where it recommends, "*Review the use of the ETSU-97 guidelines on an urgent basis with a view to adopting more modern and robust guidance for measurement of wind turbine noise, with particular reference to current guidelines from the World Health Organisation*".

5. We Need an Effective Planning Condition for AM. The wind industry claims that an AM planning condition is not necessary and that the legal remedy of Statutory Nuisance provides adequate protection are thoroughly discredited by the evidence we have published. Without an AM planning condition there is no effective remedy for wind farm neighbours against excess noise. The relevance of EAM in causing noise complaints has driven the wind industry to ensure that an AM planning condition is not applied as standard planning practice. The Application of an AM planning condition to the Den Brook (Devon) wind farm planning consent during 2009 presented a serious risk to the wind industry of a similar planning condition becoming the standard for future wind farm consents. The wind farm developer for the Den Brook wind farm has gone to enormous effort, at enormous expense, over an 8 year period to ensure first that an AM planning condition is not applied, then to have the applied planning condition removed, and finally to have it sufficiently weakened presumably to ensure

it prioritises operation of the wind farm rather than provide the intended protection against EAM.

6. There is a Lack of True Independence. The wind industry strategy of obfuscation capitalising on the trusted position of the Institute of Acoustics (IoA) as a scientific institution is discussed in our research findings. *(And continues …..)*

What are the INWG Recommendations to National Government?

- Replace ETSU. Replace the use of ETSU, as recommended by the Northern Ireland Assembly report January 2015, with a procedure based on the principles of BS4142: 2014. This will bring wind turbine noise assessment into line with other industrial noise controls. New guidance of this type should be formulated in a Code of Practice that sets out a BS4142: 2014 type methodology that reflects noise character and relates impact to the actual background noise level and not an artificial average.

- Introduce an Effective AM Planning Condition. Based on the experience at Cotton Farm wind farm in Cambridgeshire, where there has been long term professional and independent noise monitoring, we recommend an effective AM planning condition should be part of every wind turbine planning approval unless there is clear evidence it is not needed. For assessing and controlling wind turbine noise AM, it is recommended that:

  - Where wind turbine noise level and character require simultaneous assessment then BS4142:2014 should be used. The rated wind farm noise level should not exceed +10dB above the background noise level.

  - Where only wind turbine noise AM requires assessment then a Den Brook type planning condition should be used.

- Continuous Noise Monitoring. Continuous noise monitoring of wind turbines should become a standard planning condition for all wind turbine planning approvals as recommended in the Northern Ireland Assembly report, January 2015. This should be funded by the wind turbine operator but controlled by the Local planning Authority (LPA) with the noise data made openly available to ensure transparency. The Cotton Farm community noise monitor describes an example of how this can be achieved. See: http://www.masenv.co.uk/~remote_data/

- Further Research into the Impact of Low Frequency Noise. There is a need to commission independent research to measure and determine the impact of low-frequency noise on those residents living in close proximity to individual turbines and wind farms as recommended in the Northern Ireland Assembly report, January 2015.

- Issues of Ethics, Conflict of Interest & Independence. The government should deal decisively with the ethical issues surrounding the Institute of Acoustics (IoA) wind turbine noise working groups. Government departments should disassociate themselves from the IoA until conflict of interest and ethics issues are resolved and full transparency is restored.

The full report and detailed working papers are available online at the Chris Heaton-Harris website, which as the Minister of State concluded, should be considered alongside other evidence, as part of CBC's review of this matter.

MAS Environmental Report February 2015

MAS were appointed by CBC to assess noise impacts for the existing wind turbine at Double Arches Quarry. The report produced by MAS addresses the Application (CB/14/04463) to vary condition 10 of the original planning approval which sets noise limits for dwellings around the wind turbine site. Sections 3.4 and 3.5 of the MAS report state:

"The second element relates to excess or enhanced AM …. Following research by MAS and the Japanese in 2013, the wind industry body Renewable UK released research confirming the existence of EAM as a problem and proposing a draft planning condition. It is evident from the individual publication dates of the Renewable UK research projects that lead researchers of the project accepted the need for an AM condition from around January 2013, though the formal publication of the study was not until December 2013. There are also cases where The Secretary of State has accepted the need for conditions to control EAM. The proposed Renewable UK condition has been shown to fail to prevent any EAM impact and a number of research groups are now attempting to develop an enforceable and workable condition that controls EAM. Despite the plethora of evidence regarding EAM impact, the IOA Working Group has not revised their guidance on AM.

The more extensive Japanese study based on 34 wind farms and conducted on behalf of the Japanese Government, concluded AM was a common problem at wind farms and caused serious annoyance. The extensive research at Cotton Farm in Cambridgeshire, which has developed the largest database of wind farm noise in the UK has shown that EAM is a very common problem causing widespread community complaints".

MAS then went on to comment on the GTEAM ("Greater Than Expected AM") and EAM with regards to the Double Arches Application. MAS stated within Section 4.5 of their report that:

- There is overwhelming International evidence to support that EAM is a common occurrence;
- That there is the need for EAM control; and
- That the condition is easy to implement and is workable.

Furthermore, in the Application Report by Hayes McKenzie they conclude:

"This has resulted in the inclusion of a mechanism to assess and regulate AM effects in the standard form of a condition frequently applied to wind farm developments as included in the IOA GPG. The IOA is currently reviewing this mechanism and recently released a discussion document which reviews several different methods for rating AM in wind turbine noise".

They do not, however, state whether such a condition has been applied.

In conclusion:

- AM is a potential Public Health hazard.
- Levels of EAM/GTEAM must be controlled at the Double Arches/proposed Checkley Wood site.
- We contend that MAS Environmental or other suitably qualified body should be appointed by CBC to prepare an independent Noise Impact Assessment, taking into consideration the work of the various groups on AM and recommend a methodology for dealing with AM at the proposed site.

CBC has an overriding Public Health responsibility which obliges it to assess and recognise the issues raised above fully in advance of determining the Application.

9. **HARMFUL IMPACTS FROM SHADOW FLICKER**

Shadow Flicker is well described by the Applicant.

"A wind turbine can cast long shadows, when the sun is low in the sky. When the sun is specifically positioned in the sky with respect to a turbine and the window of a neighbouring dwelling, this shadow may pass over the window, potentially causing a drop in light levels which comes and goes with each pass of a blade".

Engena have compiled a Shadow Flicker Assessment. Within that Report they identified a zone of potential effects with a radius of 1,237.5m which includes 249 dwellings.

The Report identifies 22 dwellings that will suffer a Flicker effect with a maximum occurrence on 91 days a year (Checkley Wood Farm) and in total on 254 days a year.

The Shadow Flicker effect in these houses will provide a significant adverse effect to the residential amenity of the houses and will have a detrimental impact on the lives of the residents.

The Report then attempts to suggest certain features that have the "potential" to act as screening for the dwellings, but even this potential screening is described in many instances as :-

- Unlikely to provide significant screening
- Only provide low level screening
- Unlikely to provide screening
- Potentially screening …. To a minor extent

In summary, it clearly concludes that there is no screening for these properties and that the negative impact on the lives of the residents has not been mitigated.

The solution suggested by Engena is ***"If effects are observed by the residents, to protect their amenity, control of the turbine would be used to turn the machine off during the brief periods identified when conditions are such that the effect may occur".***

Given the Report demonstrably shows that effects will be observed, we do not understand why the word "if" is inserted in the above Statement …. Shadow Flicker effects will be present and, therefore, they will be observed.

Given the Applicant's own report and conclusions, we understand that, this would mean switching the turbine off, at times, on 254 days out of every 365.

If there was ever an admission that this is the wrong location, this must be it.

The Shadow Flicker Assessment Report has confirmed that the proposed Checkley Wood wind turbine will:-

- Reduce the residential amenity of 22 dwellings
- That the impact cannot be mitigated through screening
- That the only possible mitigation is to switch the turbine off, at times, on up to 254 days a year
- That the potential benefits from energy production have been, once again, diminished

10. **HARMFUL IMPACTS ON PUBLIC HEALTH**

"Like the wind industry today, the tobacco industry denied for many ears that there were any adverse health effects from their products. Corporate denial of a health problem is generally a delaying tactic not in the best interest of the public". Dr. Keith Stelling MA, NAIMH, Kip Phyt, MCPP (England)

We now turn to the crucial question of Public Health, where we believe more work is required and needs to be fully evaluated by CBC.

The potential impacts include:-

- Physiological disturbance from Shadow Flicker
- Impacts arising from noise levels above permitted limits
- Physiological effects from low frequency infra-sound
- Sleep deprivation and stress related illnesses

The level of understanding required to fully assess these risks is beyond our level of comprehension.

We could quote multitudes of research paper that suggest a causal link between the presence of wind turbines and damage to Public Health. Correspondingly we accept the Applicant can find research that suggests such a link is not present. However, we are talking here about Public Health and, as such, "probably" is not sufficient. We need to be certain.

We, therefore, believe that given there are 249 dwellings within 1,237m of the proposed turbine, CBC must review this area in detail and satisfy itself that the proposed development is NOT a risk to Public Health as part of its fundamental responsibility to protect Public Health.

11. RISKS TO AVIATION AND AIR SAFETY

"It is essential that wind energy developers form a relationship with the relevant service provider in order to deal with the harm that their development may cause, prior to making an Application. It is the responsibility of the developer to consult with the aviation stakeholder to discuss whether mitigation is possible and, if so, how it would best be implemented". Civil Aviation Authority : CAP 764 Policy and Guidelines on Wind Turbines.

The Liaison Group of UK Airport Consultative Committees has reminded LPAs that they also have a role to ensure such consultation takes place in the case of wind farm Applications:

"Where in a proposed development the height of a building or structure would exceed the level indicated on the safeguarding map for that area, the local planning authority is required to consult the Airport. Consultation is also required in any case within a 13 kilometre zone marked on the map were the proposed development is for other aviation uses or is likely to attract birds and to wind farm developments ***within a 30 kilometre radius"***

Air Safety is not an issue for which partial or selective evaluation by the Applicant or scrutiny by the LPA is acceptable. *"Good enough"* is not acceptable when public safety is being put at risk. Checkley Wood lies in very close proximity to special settlements, the A5 trunk road and the West Coast mainline railway, not to mention the major populations of Milton Keynes and Leighton Buzzard. **Any air safety incident involving collision between aircraft and turbines could well have catastrophic consequences and result in substantial loss of life.**

National Policy Statement EN 1 requires that:

"The Applicant should consult the MoD, CAA, NATS and any aerodrome – licensed or otherwise – likely to be affected by the proposed development in preparing an assessment of the proposal on aviation or other defence interests".

So again, it is the responsibility of the Applicant to ensure that their consultation of all aerodromes, whether licensed or not, is comprehensive.

MOD

Under NPS EN-1 (DECC 2011a) developers are required to consult with Defence Estates (Ministry of Defence, MoD), Civil Aviation Authority (CAA), National Air Traffic Services (NATS) and any aerodrome likely to be affected by the proposed development to determine whether or not the proposal will conflict with their activities.

The Ministry of Defence have responded to the proposal and has stated that *"they may have concerns"*.

It should be noted that the response was made on the basis of 1 turbine at height of 143.5m and not based upon the current proposal of 149.8m. Given the additional height, we can only assume they will be even more likely to have concerns.

The MOD state that the proposed turbine will be 74.1km from, detectable by and may cause unacceptable interference to the ATC radar at RAF Wittering.

Wind turbines have been shown to have detrimental effects on the performance of MOD, ATC and Range Control radars. These effects include the desensitisation of radar in the vicinity of the turbines and the creation of false aircraft returns which Air Traffic Controllers must treat as real. The desensitisation of radar could result in aircraft not being detected by the radar and, therefore, not presented to Air Traffic Controllers.

The MOD also states that fixed wing, low flying training takes place throughout the UK to a height of 250ft above ground level and down to a height of 100ft above ground level in certain designated areas. A turbine development of the height and at the location proposed may have an impact on low flying operations.

It is essential that the MOD is consulted with the correct height/size of the proposed turbine and their response fully taken into consideration in the planning determination.

Gliding Activity

This is a known and popular area for gliding. London Gliding Club at Dunstable Downs and several others regularly use this area in order to avoid the controlled airspace of Luton Airport. On Wednesday, 22 August 2012 an incident involving two very near misses by gliders of the Met Mast (near Stoke Hammond) occurred due to sudden loss of lift. One pilot said he had not even seen the met mast before his unplanned landing.

Glider activity is already marked on the relevant Visual Flight Rules Chart. The London Gliding Club at Dunstable Downs has also been annotated on the Cranfield Instrument Approach Procedure charges.

Cranfield Airport

CAP 764, Chapter 5 Wind Turbine Development Planning Process of the CAA Policy Document provides guidance on the suitable distances to consult aerodromes according to the onsite facilities. The distances are:

a) Unless otherwise specified by the aerodrome, or indicated on the aerodrome's published wind turbine consultation map, within 30km of an aerodrome with a surveillance radar facility.
b) Within air space coincidental with any published instrument flight procedure to take into account the aerodrome's requirement to protect its IFP's.

c) Within 17km of a non-radar equipped licenced aerodrome with a runway of 1100m or more.

Cranfield Airport is 12.7km North of the proposed site and has a maximum runway length of 1799m. We have contacted Cranfield Airport (May 2016) and they have confirmed they were not aware of the proposed Checkley Wood wind turbine.

Cranfield Airport is an airport in the process of expanding with the consequential socio-economic benefits this would bring to the region and CBC has responsibility to facilitate this.

Cranfield Airport must be informed of the proposed development and consulted with fully.

This area is also home to a large number of other low level manoeuvres. The same airspace is also being used for military and emergency service purposes. Cranfield Airport itself has one of the largest flight training schools in the country and RAF Halton uses the airspace for training purposes and gliding.

At the date of this report, we have not been able to find responses from:-

- MOD (as noted above)
- Cranfield Aerodrome (we contacted Cranfield Aerodrome Administration Team at the beginning of May 2016 who were unaware of the proposed Checkley Wood Turbine)
- Luton Airport
- The London Gliding Club at Dunstable Downs
- Met Office (as of April 2015 the Met Office became a statutory consultee for planning relating to their technical infrastructure)

Prior to determination, CBC must ensure that all these parties have fully considered the nature and details of the proposed Application and responded in full with any concerns they may have.

12. **PUBLIC OPINION AND LOCAL OPPOSITION**

"We have to work harder to find places where wind farms are acceptable to communities. Frankly we need to be prepared to bribe them". Tim Yeo, MP, Chairman House of Commons Committee on Energy and Climate Change.

We close this submission by returning to the people involved.

Government spokesmen have lately been at pains to defend the rights and interests of local communities confronted by wind farms blighting their lives. This Action Group has been given a mandate by the majority of local people alongside their parish councils who unanimously recommend refusal, to contest this Application and secure CBC's determination for refusal.

The National Planning Practice Guidance ("NPPG") was published on 6 March 2014. Policy is provided by the NPPF whilst guidance on how to use it by the NPPG.

On 18 June 2015 a new section (reference ID: 5-033-150618) was added by The Secretary of State. This states:

"Local Planning Authorities should (subject to the transitional arrangement) only grant planning permission if:

- *The development site is in an area identified as suitable for wind energy development in a local or neighbourhood plan; and*
- *Following consultation it can be demonstrated that the planning impacts identified by affected local communities have been fully addressed and, therefore, the proposal has their backing.*

Whether the proposal has the backing of the affected local communities is a planning judgement for the Local Planning Authority."

It is our clear and evidential understanding that:-

- **The proposed development site has not been identified as suitable for wind energy development;**
- **As demonstrated in this report, the planning impacts identified by the affected local communities have NOT been fully addressed;**
- **The proposal does NOT have the backing of the majority of local residents. Objections to this development amount to 96% (721) of comments lodged with CBC (due to administrative delays within CBC, we have had to rely partially on figures from the SCWT website, as agreed with D Hale, 22 June 2016); and**
- **All the locally affected Parish Councils have recommended on behalf of their Parishes, refusal of this Application. These parishes are Heath and Reach, Potsgrove, Aspley and Woburn, Great Brickhill, Hockliffe, Toddington and Soulbury**

(post the date of this Submission, SCWT will be consulting with the Parish Councils of Eggington, Stanbridge and Tilsworth and Billington).

Neither is there evidence to suggest that the Applicant has made any real efforts to mitigate the impact of this proposal on the local communities other than when no other option is available, simply switching the machine off and thereby terminating the benefits produced.

There is no evidence to suggest that the Applicant has considered other forms of renewable energy (solar panels for example).

There is no evidence to suggest that the Applicant has considered other more appropriate sites.

The greatest impact of this proposed development will be on thousands of local residents. The vast majority of those that attended public meetings fervently objected to this development and continue to do so with 96% of comments objecting to this Proposal.

The Localism Act was designed for just such a scenario. Its purpose is clear. This Action Group has been given a mandate by local people, through their Parish Councils, and on behalf of those people we claim our right to decide what happens in our communities.

The people's right to be heard is reinforced in a statement to Parliament on 22 June 2015. Amber Rudd, The Secretary of State for Climate Change, confirmed to the MP for Wellingborough that if his borough Council *"turns down an Application for a wind farm, its decision cannot be overturned by the Planning Inspectorate".*

In an article in Planning Magazine (26 June 2015) a spokesperson for The Department of Communities and Local Government clarified the Government's position to say *"that developers will retain the right to appeal decisions although they will have to take into account the clear requirement for local backing"* (Briefing Paper 04370, House of Commons Library).

That clear requirement for local backing is absent here and we expect to be empowered and heard and implore Central Bedfordshire Council's determination for refusal.