

22/00654/DEEM

SITE ADDRESS: SCLENTEUCH WIND FARM, STRAITON, SOUTH AYRSHIRE, KA19 7NJ

DESCRIPTION: APPLICATION UNDER SECTION 36 OF THE ELECTRICITY ACT 1989

FOR PERMISSION TO CONSTRUCT AND OPERATE SCLENTEUCH WIND FARM

TOPIC : WIND TURBINE NOISE AND RESIDENTIAL AMENITY

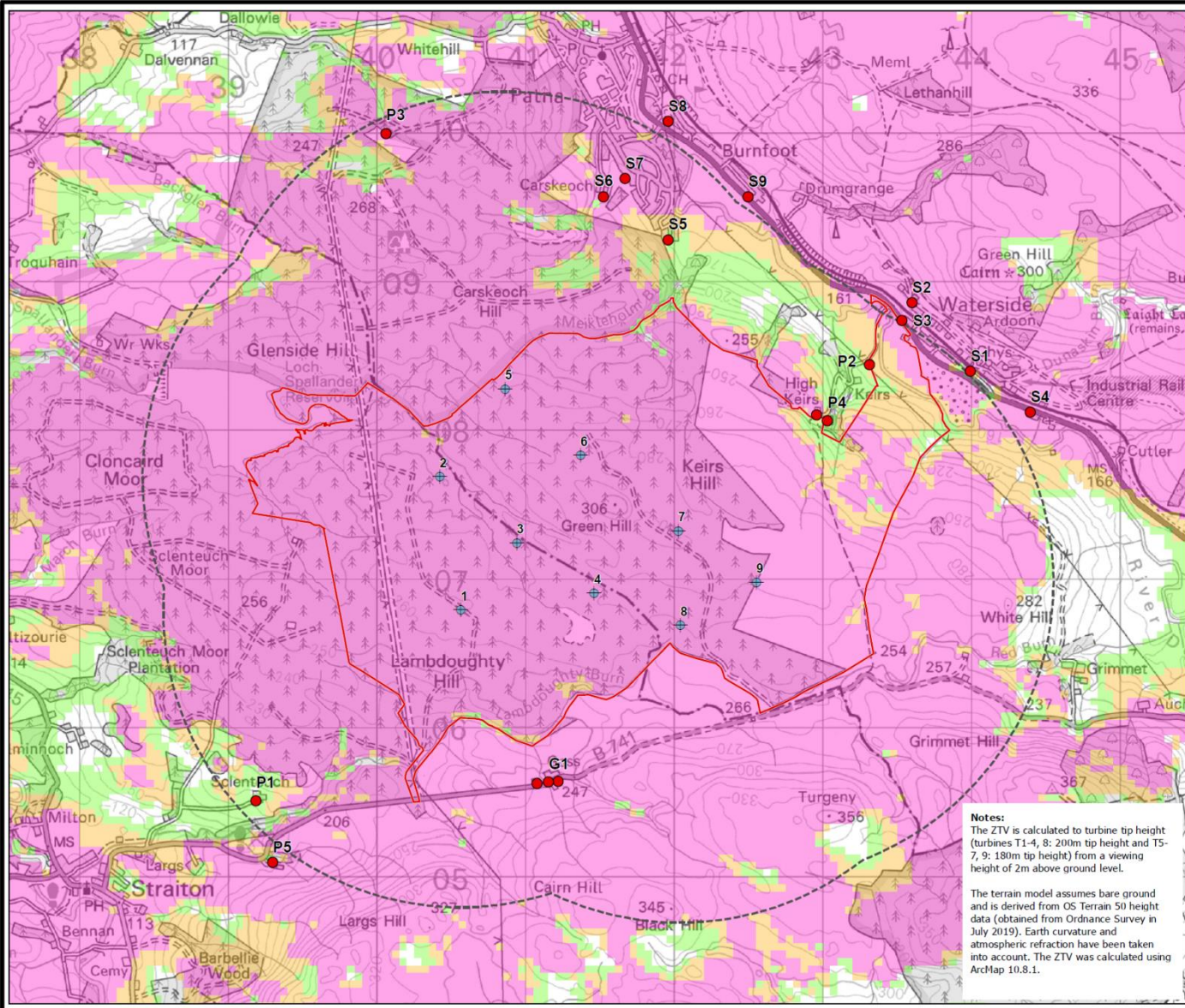
ON BEHALF OF Save Straiton for Scotland.


17.7.2023

Citizen's Initiative UK wish to submit the following objection related to Noise issues on behalf of Save Straiton for Scotland.

Citizen's Initiative UK is an independent Planning & Noise Consultancy Service which has considerable expertise and experience gained well over a decade, by representing vulnerable Residents & Communities, in respect of Industrial Scale Planning Applications. The Consultancy also acts as a researcher in Scotland for IARO, and draws on the expertise and experience of this International team of highly qualified professionals, experts in the field of acoustics and the assessment of potential acoustical environmental impacts on residents and communities from proposed developments. Susan Crosthwaite (Principal) is a member of the Independent Noise Working Group, (INWG) formed in August 2014. INWG's Mission Statement is:

'INWG's principle aim is ensuring that the acoustic impacts from wind turbines are properly controlled in order to protect public health and well being'.








SCLENTEUCH WIND FARM

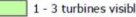
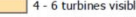
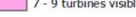
FIGURE A5.4.1

RESIDENTIAL VISUAL AMENITY ASSESSMENT STUDY AREA WITH BLADE TIP HEIGHT (180M AND 200M) ZONE OF THEORETICAL VISIBILITY (ZTV)


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2022 ORDNANCE SURVEY 0100031673

-  Turbine
-  Proposed Development Area
-  2km from outer turbines

Potential Turbine Visibility (Tip Height)

-  1 - 3 turbines visible
-  4 - 6 turbines visible
-  7 - 9 turbines visible

RVAA - Individual Properties within 2km

-  Individual Properties
- G1 - Gass
- P1 - Scienteuch Farm
- P2 - Low Keirs
- P3 - Carclout
- P4 - High Keirs Cottage
- P5 - Glenash
- S1 - Waterside, Doon Valley Railway (LVIA VP2)
- S2 - Waterside, north end (LVIA VP3)
- S3 - New Cottages
- S4 - Chapel Row
- S5 - Keirs Crescent
- S6 - Carskeoch
- S7 - Clements Wynd
- S8 - A713 (LVIA VP4)
- S9 - Burnfoot

Notes:
The ZTV is calculated to turbine tip height (turbines T1-4, 8: 200m tip height and T5-7, 9: 180m tip height) from a viewing height of 2m above ground level.
The terrain model assumes bare ground and is derived from OS Terrain 50 height data (obtained from Ordnance Survey in July 2019). Earth curvature and atmospheric refraction have been taken into account. The ZTV was calculated using ArcMap 10.8.1.

Scale: SCALE - 1:25,000 @ A3

ENVIRONMENTAL STATEMENT & PLANNING APPLICATION 2022

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1. Scienteuch WindFarm ECU 00003318 have applied for nine turbines up to 200metres high, RES states: 'normally' rated at 6MW (Max Total MW Of Development Applied For:). This site is totally unsuitable for a wind power plant of this size as the Proposed Development is located approximately 1 km south of Patna and Waterside with a population of around 2000 people and there are well over a hundred homes within close proximity to the site. Eighty six noise receptor homes, are listed in Table 12.7 – with only **SIX** assumed representative background noise survey locations, listed on pages 9 & 10 in the Noise EIAR Vol 1 Chapter 12.

1.1. As can clearly seen in the applicant's Figure A5.4.1 (above) – Residential Visual Amenity Assessment, this industrial wind power plant will have an overbearing impact on surrounding communities and visitors to the area, 7 – 9 turbines being clearly visible and dominating this area.

2. Following the Regulatory planning hearing on 27th June 2023, South Ayrshire Council submitted their response offering no objection to this development. **Save Straiton for Scotland strongly object to this response particularly with regard to the impact upon the residential amenity of all the sensitive locations in the surrounding Community.**

The lack of opposition by SAC to the proposed development does not assure that the nearby Communities will have an acceptable residential amenity as described below:

This is contrary to South Ayrshire Council Supplementary Guidance: Wind Energy South Ayrshire Council (2015) Supplementary Guidance on Wind Energy (superseded) Part 2:

Development Criteria.

We will support proposals if: they do not have a significant detrimental visual impact, taking into account views experienced from surrounding residential properties and settlements, public roads and paths, significant public viewpoints, and important recreational assets and tourist attractions;

An assessment of the visual effects on the following interests (where relevant) will be requested: Homes and towns and villages within 5km of a windfarm.

C: Communities Quality of Life and Amenity

Visual

The siting and design of a windfarm provide the most effective means of minimising visual and landscape impacts. Design objectives should take into account local residential property and the extent that the proposal will be visible. This design process should seek to minimise significant visual effects on private

property work place or community facility. As a general rule a minimum separation distance of 2km from towns and villages to a turbine will be required. Individual dwellings should be sufficiently distant to minimize significant visual effects. This assessment should be informed by residential visual amenity surveys, all property within 2.5km of wind turbines should be considered in this assessment. Also

G: Cumulative Impact

Establishing boundaries and maintaining visual separation from other wind farms would allow for a clear distinction to be perceived between the wind-farmed landscape and the landscape beyond. It is therefore proposed, consistent with Scottish Planning Policy (Paragraph 169), to provide significant protection to the sensitive foothills and valley areas in the immediate vicinity of these windfarm landscapes in order that the integrity of local landscapes and their character can be retained. These areas have been incorporated within table 2, Landscape Strategy

- 2.1. SAC's Regulatory Panel decision is contrary to the planning system which is intended to protect the health and well being of those who are impacted by planning developments. South Ayrshire Local Development plan adopted in August 2022 on page 79 states:

Air, noise and light pollution can have serious effects on health and well-being. Rather than trying to lessen these effects after a development has taken place, we think it is more effective to avoid developing areas where these problems could occur.

LDP policy: air, noise and light pollution:

We will not allow development which would expose people to unacceptable levels of air, noise or light pollution.

3. A Supreme Court judgment in Australia (**Bald Hills**)¹ notably stated there should be no preference towards the development of renewable energy to the detriment of people nearby. A development should be able to both address the need for renewable energy AND provide an acceptable environment for those nearby to have an acceptable acoustic amenity.
4. South Ayrshire Council (SAC) has taken the advice of ACCON and Environmental Health to make planning decisions with regard to noise impacts from wind turbine noise on those living in proximity to such developments. ACCON relies on ETSU R 97 and The Good Practice Guide as it states:

The Council's noise consultant, ACCON UK Limited, have been internally consulted to review the submitted documents relating to noise in order to inform Council considerations as whether the noise assessments have been carried out appropriately and to advise on the acceptability or otherwise of the proposals with respect of noise. In their response, ACCON has advised that the methodologies used in the noise chapter represent good practice and are in line with ETSUR-97 (operational noise) and the Institute of Acoustics (IOA) Good Practice Guidance for wind turbines. As part of this, they also endorse the approach to deriving cumulative noise limits and subsequent site-specific noise limits which they conclude are also in line with the same guidance referenced above.

- 4.1. We consider, having reviewed the evidence submitted by the applicant's acousticians that ACCON and SAC Environmental Health and therefore SAC and the Regulatory Panel, are not fully informed regarding the detrimental operational impacts arising from the significantly increased size and power levels, both individually and cumulatively of the proposed large scale industrial turbines will have on the acoustic environment.
5. Evidence produced from Freedom of information EIR informs that there are many historic unresolved complaints from wind turbine noise in South Ayrshire. In a response to EIR/2022/2965, South Ayrshire Council has acknowledged that it has received 89 wind turbine noise complaints up to April 2022 - since 2010: (EIR questions are in grey)

*'4. How many Noise complaints have been received by South Ayrshire Council about wind turbines/ wind farms in the South Ayrshire Council District? **Since 2010 we have received 89 complaints** as per attached excel spreadsheet 73 of them were about Hadyard Hill as listed in the table below extracted from the excel sheet:*

¹ Bald Hills Judgement

| | | | | |
|----|--------------|-------------------------|--|---|
| 1 | | | | |
| 2 | | 22/01046/FOI | SAC Wind Turbine Noise Complaints 2010 - Present (22/04/2022) | |
| 3 | | | | |
| 4 | Year | No of complaints | Wind Farms | Uniform Refence |
| 5 | | | | |
| 6 | 2010 | 1 | Hadyard Hill | 10/07409/NOIOTH |
| 7 | 2011 | 1 | Hadyard Hill | 10/02341/NOIOTH |
| 8 | 2012 | 0 | | |
| 9 | 2013 | 0 | | |
| 10 | 2014 | 1 | Hadyard Hill | 14/05484/NOIENQ |
| 11 | 2015 | 4 | Hadyard Hill x4 | 15/01888/NOIOTH |
| 12 | 2016 | 33 | Arecleoch x3 | 16/03822/NOIIND, 16/04415/NOIIND, 16/02216/NOIIND |
| 13 | | | Hadyard Hill x 29 | 16/01114/NOIIND, 15/01888/NOIOTH |
| 14 | | | Kilgallioch | 16/02216/NOIIND |
| 15 | 2017 | 36 | Kilgallioch x2 | 17/01623/NOIIND, 17/02040/NOIIND |
| 16 | | | Hadyard Hill x 34 | 15/01888/NOIOTH |
| 17 | 2018 | 1 | Kilgallioch | 18/03162/NOIIND |
| 18 | 2019 | 8 | Hadyard Hillx3 | 19/01570/NOICON |
| 19 | | | Kilgallioch x5 | 19/00462/NOIIND |
| 20 | 2020 | 2 | Clauchrie x2 | 20/00265/NOIIND, 20/00274/NOIOTH |
| 21 | 2021 | 1 | Mark Hill | 21/0499/NOIOTH |
| 22 | 2022 | 1 | Kilgallioch | 22/00423/NOIIND |
| 23 | Total | 89 | | |
| 24 | | | | |

When a noise complaint has been registered, how does South Ayrshire Council currently ensure the protection of the Health and Well Being of windfarm neighbours from the on-going noise pollution from the wind turbines?

We investigate it to the best of our ability. Where a statutory nuisance is found to exist we would serve an abatement notice in terms of the Environmental Protection Act 1990. In some instances the Planning Service can instruct the developer to employ their own third party consultant to investigate.

How many of these complaints have been satisfactorily resolved in favour of the complainant?

This information is not recorded, but we advise the complainer to keep in touch if there are further problems and the service request is closed after three months if there are no further complaints to us.

5.1. As a result of this and other EIR's, and evidence from unresolved noise complaints in SAC and other council areas, we have significant concerns as to the ability of SAC, or any council in Scotland, to be able to fully independently investigate a wind turbine noise complaint or to bring forward a successful Noise Abatement case. We are not aware of any successful wind turbine Noise Nuisance case in Scotland being brought about through council action in support of resident's noise complaints against the operator of an operating wind power plant. Evidence is provided in **Appendix 1, and below.**

5.2. Complaints about an adverse acoustic environment which includes audible and Infrasound and Low frequency Noise (ILFN) remain unresolved as wind turbine operators almost always are able to demonstrate compliance. There is currently no guidance or mechanism to deal with ILFN.

- In South Ayrshire, homes have been abandoned due to unbearable health impacts – High Tralorg in 2015 – Mr and Mrs Siddell still pay council tax on their home -see witness statement 1.
- Bought out by developer – Tralorg windfarm - and the complainant family subsequently gagged by an NDA - Low Tralorg see witness statement 2.
- Property Sold on to an unsuspecting buyer complete with a letter from the wind turbine operator saying that the home had no noise issues, even though the owners' health deteriorated, and their complaints could not be satisfactorily resolved - anonymous.
- Ongoing and unresolved cases after years of complaints, having endured long term 'independent' monitoring that found the developer compliant - **Dochroyle** -where pleas for help still remain ignored and unresolved, justified by the EHO advising the complainant to continue to keep in touch if there are further problems see witness statement 3.

Living and suffering from impacts from acoustic pollution from wind turbines is '*dose related*' and it is almost impossible for an investigating EHO to '*perceive*' any noise nuisance on an '*occasional*' visit. These witness complaint statements are logged in **Appendix 2**.

5.3. EIR/2022/2965 revealed that the complaint service request is closed after three months if there are no further recorded complaints. This is often the case as living under the shadow of turbines has such debilitating impacts on the health and wellbeing of those suffering, that they do not have the sustained energy to constantly keep up the pressure of pursuing the constant denial of their health complaints, so they give up and are then subjected to a life of misery, through NO Fault of their own. This is completely unacceptable.

5.4. This evidence is before the current Conjoined Inquiry WIN-370-4, 5, & 6 and the matter has been raised at a meeting between myself and colleague Mr Melvin Grosvenor, with Head of SAC Planning Craig Iles on 19th June.

5.5. **This is a significant issue which is causing even greater concern, as the renewable energy policy is driving development of large-scale wind turbines, like these 9 turbines, of even greater size and capacity closer to many more homes.** As previously stated; The Supreme Court judgment in Australia (Bald Hills) notably stated, there should be no preference towards the development of renewable energy to the detriment of people nearby. A development should be able to both address the need for renewable energy AND provide an acceptable environment for those nearby to have an acceptable acoustic amenity.

6. **Appendix 2** also details evidence of a Noise Complaint and Noise Nuisance case concerning Hadyard Hill wind turbines. As a result of a noise complaint which was investigated from May 2015, a Noise Abatement **was** served on Scottish and Southern Energy PLC.

² CD. Save Straiton 3 Noise Complaints witness statements. pdf

by SAC on 24th February 2016 – Ref 15/07888/NOIOTH/1. The question as to why this abatement was not upheld remains unanswered? Evidence shows that further compliance monitoring was deemed necessary by the council to measure this nuisance case, even though an investigation was completed by the ‘retiring’ EHO with the necessary legal procedures obviously completed before the abatement order was served. A council meeting, held to discuss this complaint ³, revealed that further compliance monitoring had been carried out in April 2016 and the results were discussed - HADYARD HILL WIND FARM, DAILY MEETING held on Friday 29th April 2016 Fourth Floor Meeting Room, Burns House, Burns Statue Square, Ayr, KA7 1UT SAC Ref. 517357-290416

6.1. SAC Reference 514065. On the 11th May 2016 this email was sent by the complainant:

Firstly I accept you have invested substantial resources investigating our nuisance complaint which resulted in an Abatement notice being served on SSE, lets take that as a starting point or are you now saying that was mistaken in her determination of the turbines being a nuisance. You keep referring to noise levels although our complaint is about nuisance and you seem to be saying that that is based on levels. As you will be aware any form of monitoring of a person or their property is an invasion of their privacy which we have already accepted for a period of some months and all the information in the report supplied to you by SSE via TNEI proves the levels were breached day and night. If we take it that you believe the nuisance levels are based on noise levels then (which I disagree with) the council should, based on these breaches revealed in the report, be doing something about it. To sum up we do not appreciate you giving us an ultimatum of, either we once again give up our privacy to SSE and TNEI or our complaint may take longer, I can assure you it wont. You have all the data you need to impose restriction on the wind farm but for some reason you are unwilling to implement them, we find this more than curious and will be taking legal advice on all of these issues. Also SSE have stopped 3 closest windmills which goes some way to accepting there is a problem and they are liable but doesn't go far enough and we will not accept a half baked solution. I hope you do attend our property soon and witness the nuisance we have been complaining about and things will then move forward. You can tell whatever you feel is necessary but until you have attended our property and heard the character of the turbines the monitoring is on hold. This is not a refusal just a request for a short delay until the council have a chance to establish whether or not there is a nuisance.

6.2. The EHO responded (same Reference 514065):

I believe did satisfy herself of the existence of a statutory nuisance at that time hence the reason she served the original notice. However, as you know, she is no longer employed by the council and another authorised officer is now required to satisfy themselves similarly.

³ 517357-290416 Hadyard Hill Meeting Minutes (GL)

Apologies if you think I issued you any ultimatum, this was not my intention. I only stated the fact that in my opinion, the refusal by you to permit monitoring by SSE Generation's consultants at your property will ultimately result in a delay in resolving the issue. SSE Generation have self-imposed restrictions by shutting down the 3 closest turbines to your property from 19:00 – 10:00 every day. This obviously has to be taken into account in determining the existence or otherwise of a statutory nuisance.

For info, a breach of planning conditions would not necessarily result in a statutory noise nuisance – Planning is a totally separate regime.

As I have stated on a number of occasions, we are happy to continue monitoring - however this requires you to call us when you feel that there is a statutory nuisance (from volume of noise, character of noise or a combination of the two) and we will endeavour to attend as resources permit.

6.3. Reference 513478 11th May 2016 from the EHO to the complainant:

The intention of the new monitoring exercise by TNEI on behalf of SSE Generation is to examine what mitigation is required in order to reduce the noise levels to within the permitted levels. As previously discussed, however, an exceedance of the agreed noise limits does not necessarily constitute a statutory nuisance

Obviously, a delay in commencing monitoring will result in a subsequent delay in any further remedial action or mitigation action by SSE Generation. It is therefore in your best interests to permit this monitoring goes ahead at the earliest opportunity. Furthermore, any delay by you may also affect any future proceedings taken by us. I appreciate that witnessed a nuisance and served a notice erroneously on SSE, however as discussed yesterday, before an officer signs an abatement notice, they must first satisfy themselves of the existence of a statutory nuisance.

I have now carried out three witnessed visits to your property but have still to witness a statutory nuisance in terms of the Environmental Protection Act 1990. I can give no assurances or guarantees that despite our officer's best endeavours that we will witness a statutory nuisance in the near future but are keen to continue to visit as and when officer resource permits.

I will advise that you do not wish monitoring equipment installed in your property at this time,

6.4. SAC Reference 556163 On February 15th 2017 SAC informed the complainant that their case was closed:

We have been corresponding with (with whom I believe you reside) directly on this matter for some time now and I regret to advise you that the Council has concluded that there is no evidence of a nuisance being caused from the turbines either inside or outside of the cottage.

Accordingly I have advised that the Council has discharged its duty to assess for nuisance and will not respond to further complaints.

If that situation should change for any reason we will let you know but further requests for attendance will not be responded to.

SAC reference 569979 3rd May 2017, the complainant had continued with his noise complaints:

ALTHOUGH YOU HAVE INFORMED ME NOT TO LODGE ANY FURTHER COMPLAINTS ABOUT THESE WIND TURBINES
MY LAWYER HAS ADVISED ME TO CONTINUE

14th register of complaint by e-mail 03/05/2017

I would like to register a complaint about the nuisance level and the constant whirring of the wind turbines across from my home atThe constant repetitive whooshing sound is causing major problems for myself as it prevents sleep and the circulation of fresh air due to having to keep windows firmly shut. Please have any officer who qualified in this area of nuisance which does not refer to noise levels only as you keep trying to shift it to, or let me know if you do not have anyone qualified in this area of nuisance so i can get an independent report from someone who is. May i also inform you that have had another report from SSE via TNEI and yet again they have not addressed the nuisance of the repetitive sounds of the windmills but noise level only and as the nuisance is not based solely on level of sound but the characteristic of the sound and the time endured by it is.

- 6.5. Years of distress were endured since the first complaint in 2015 through endless emails and communications complaining about so many different aspects of the noise, enduring long periods of intrusive noise monitoring, and doctor's letters linking sleep disturbance to the health issues caused by the presence of the wind turbines largely ignored. The response by the council is totally unacceptable, again leaving wind turbine victims with no satisfactory recourse, as the council failed to uphold its statutory duty. SAC basically abandoned the noise victims and dismissed the case. This again demonstrates the inability of *'noise impacts to be controlled through the imposition of suitably worded noise related planning conditions'*.
- 6.6. The actions of this EHO and other officers involved in dealing with this case require further investigation. It is apparent this and other cases that The EHO's are doing everything they can to avoid exercising their statutory responsibilities. How can residents sustain years of noise abuse and lack of concern, care, or action from the very councils that the Scottish Government have designated as the statutory body to deal with Noise Nuisance.
- 6.7. What is of further concern is that these EIR's exposed the fact that these Compliance Reports clearly both showed Non Compliance of the Hadyard Hill Turbines – No action was taken to remedy this on behalf of these residents and the evidence of non compliance was buried until now. Expert acoustician Mr Huson states in his report on this to the Conjoined inquiry ⁴:
 - 6.7.1. Table 1 in Annex 6 of the report details that the predicted sound pressure level at this property was 43.8 dBA, which was the predicted LA90 for all wind turbines on in a wind speed of 12 m/s in a downwind sector.

⁴ CD 17 23 Matters for Reporters Noise. docx

- 6.7.2. The analysis shown in the report covers testing in sectors covering 75° to 270°, as shown in Figure A1.1. of Annex 1 in the report. This wind direction range includes both upwind and downwind directions, not only the downwind conditions that would be assumed worst case.
- 6.7.3. Despite the averaging of upwind and downwind data the report shows in Annex 7 (results with wind speeds up to 12 m/s) shows that the 'Specific Wind Turbine Noise (ON minus OFF)' according to ETSU-R-97 in the quiet daytime is 56.8 dBA and is 57.8 dBA at night time in a wind speed of 12 m/s.
- 6.7.4 It is clear that the predicted sound levels at this property of 43.8 dBA in a downwind sector was incorrectly calculated when the actual sound levels average 57.3 dBA for the quiet daytime and night periods have been measured.
- 6.7.5 This data demonstrates that the 'conservative' assessment methods using ETSU-R-97 and the IoA Good Practice Guidelines are far from conservative/optimistic.

This underestimation of the true sound level impact amounts to 13.5 dB.

- 6.8. It is of immense concern that acousticians, including those (unnamed) from Natural Power representing RES, continue to scope out and postulate the unsound position as stated within the WSP BEIS report that; "*indicates that wind turbine infrasound has no adverse effects on human health at typical exposure levels and that it is not necessary to consider wind turbine infrasound when determining development applications*". *Furthermore, assessment on the basis of 'A' weighted sound levels (the approach in the ETSU-R-97 assessment methodology) provides sufficient control over the potential impact of low frequency noise*".

How is it scientifically possible, when only assessing 'A weighted' data to possibly be able to understand or have 'sufficient control' of the impact of the full acoustic environment on the health and well-being of those living in close proximity.

- 6.9. The ongoing and currently unresolved wind turbine noise nuisance case in respect of the RES Blary Hill Wind Power Station, is having a devastating impact on the affected residents, to the same extent as those experienced by the Hadyard Hill residents above. This Blary Hill noise complaint has been on going for eighteen months, during which time RES could have properly studied the impact of their turbine on this community.

- 6.10. The ETSU-R 97 Wind Turbine Noise Planning Conditions imposed by the Reporters at the Blary Hill Appeal Case reference: PPA-130-2052 by (Mr S Ferry and Mr C Warren) are failing to protect the residential amenity of the residents and are therefore, not fit for purpose.
- 6.11. The experience and evidence of Rita Holmes⁵, as one of the residents whose health was severely impacted by the Hunterston turbines, also advises, that adversely impacted resident's residential amenity is not protected by the current WTN guidance. How many more cases are there that are hidden or unresolved, whereby residents are not being supported by their Local Planning Authority or Environmental Health Departments?
- 6.12. Infrasound and low frequency noise have long been recognized in other countries as a physical agent of disease, with protection being provided to both workers (occupational exposures) and the general public (environmental exposures). It is recognized, however, that medical professionals in the United Kingdom are generally unfamiliar with this physical agent of disease (infrasound and low frequency noise) and with the consequent pathophysiology that develops after continuous exposure times (i.e., in the absence of biological recovery times, even during sleep). This lack of knowledge naturally impedes proper diagnoses, prognoses and treatments.

Commentary on “Wind turbine noise and human health impacts in Fairlie, North Ayrshire” produced by Health Protection Scotland, July 2017. by Mariana Alves-Pereira, Ph.D. August, 2021⁶. addresses this situation:

3.The documents I have been asked to scrutinize make reference to several scientific papers in which very complex matters are discussed in detail. It is my objective to facilitate the understanding of the more relevant scientific complexities to the Reporters of this Appeal Hearing.

21.It is, to me, extraordinary that despite the acknowledgement that “noise annoyance” is not a usually studied health outcome, the use of “noise annoyance” is nevertheless accepted by a medical practitioner as a bona fide parameter to assess health effects caused by exposure to a physical agent of disease.

23.When dealing with a physical agent of disease, dose-response relationships can only be achieved if proper and relevant clinical measures can be associated with quantified doses of

⁵ CD Save Straiton Hearing Statement Rita Holmes April 2023.pdf

⁶ Commentary on “Wind turbine noise and human health impacts in Fairlie, North Ayrshire” produced by Health Protection Scotland, July 2017. by Mariana Alves-Pereira, Ph.D. August, 2021

the agent of disease. “Noise annoyance” is not a clinical measure. Again, this is usually something that has to be explained to professional acousticians, but not to medical practitioners.

32.

For the information of the Reporters of this Appeal Hearing (and for any medical practitioners who can take a deeper interest in this subject matter), dose-response relationships for ‘noise’ emitted by industrial wind turbines cannot rely on the dBA metric, 1/3rd octave band analyses and 10-min time averages to characterize the physical agent of disease.

7. Extract from Onshore Wind Policy Statement 2022 (OWPS) Issued by the Scottish Government December 2022.

3.7. Noise

3.7.1. *‘The Assessment and Rating of Noise from Wind Farms’ (Final Report, Sept 1996, DTI), (ETSU-R-97) provides the framework for the measurement of wind turbine noise, and all applicants are required to follow the framework and use it to assess and rate noise from wind energy developments.*

3.7.2. *The Institute of Acoustics (IOA) Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise was published in May 2013 to support the use of ETSUR- 97 when designing potential windfarm schemes, and the monitoring of noise levels from generating sites. The Scottish Government recognises this guide as a useful tool which developers can use in conjunction with ETSU-R-97.*

3.7.3. *The Scottish Government is aware that the UK Government has been considering the extent to which ESTU-R-97 may require updating to ensure it is aligned with the potential effects from more modern turbines. The Scottish Government supports this work and anticipate the results of a short-term review project in due course.* (our emphasis)

3.7.4. *Until such time as new guidance is produced, ETSU-R-97 should continue to be followed by applicants and used to assess and rate noise from wind energy developments.*

7.1. As previously stated, there is recognition in this latest update on onshore wind policy that there is a need for an update for ETSU R 97, yet there is no recognition that this guidance, and its subsequent conditions when approved at planning, does not provide the guaranteed, or substantive protection required to make living close to industrial turbines safe from harm.

7.2 The proposed Noise Conditions (WTN) are based on the standard ETSU-R-97 Guidance. It is strongly considered that extensive and worldwide experience gained over the time from the date of publication, has show that the Guidance is fundamentally flawed from the outset, as there was no medical expert on the panel, or consideration of potential health impacts from operational turbines.

7.3. It is abundantly clear the wind turbine blade tip heights have increased from under 50 metres to up to 250 metres plus, and the commensurate generating power output from under 1MW to more than 7 MW, without any notable review of Wind Turbine Noise environmental health impacts. ETSU R 97 only provides for outdated planning conditions, introduced in 1997 when turbines were up to six times smaller and six times less powerful.

7.4 Current UK Government endorsed planning guidance on WTN comprises just ETSU and the IOAGPG, which consider only audible noise, and does not address infrasound or low frequency noise (ILFN) from wind turbines. ETSU, **published in 1997, referred to infrasound (but only twice), yet the IOAGPG, published in 2013, now makes no mention at all of infrasound.** Both ETSU and the IOAGPG were substantially authored by a group of acousticians affiliated to the Institute of Acoustics, the majority of whom worked primarily as consultants to, or employees of the UK wind industry. **There were no medical experts on the panel.**

7.5 The 175-page document, titled “The assessment & rating of noise from wind farms,” has an opening statement which is fully transcribed below:

This report was drawn up under the direction of the Noise Working Group. While the information contained in this report is given in good faith, it is issued strictly on the basis that any person or entity relying on it does so entirely at their own risk, and without the benefit of any warranty or commitment whatsoever on the part of the individuals or organisations involved in the report as to the veracity or accuracy of any facts or statements contained in this report. The views and judgements expressed in this report are those of the authors and do not necessarily reflect those of ETSU, the Department of Trade and Industry or any of the other participating organisations

7.6 It might now be interesting to list the contributors who knowingly co-signed a document of (self-acknowledged) questionable veracity and accuracy:

Members of the Noise Working Group:

| | |
|----------------------------|---------------------------------|
| Mr R Meir, Chairman | DTI |
| Dr M L Legerton, Secretary | ETSU |
| Dr M B Anderson | Renewable Energy Systems |
| Mr B Berry | National Physical Laboratory |
| Dr A Bullmore | Hoare Lea and Partners |
| Mr M Hayes | The Hayes McKenzie Partnership |
| Mr M Jiggins | Carrick District Council |
| Mr E Leeming | The Natural Power Company Ltd |
| Dr P Musgrove | National Wind Power Ltd |
| Mr D J Spode | North Cornwall District Council |
| Mr H A Thomas | Isle of Anglesey County Council |
| Ms E Tomalin | EcoGen Ltd |
| Mr M Trinick | Bond Pearce Solicitors |
| Dr J Warren | National Wind Power Ltd |

The Applicant has been project co-ordinator for several Joule1 projects, leading European research into wind turbine noise, was involved in producing the guideline 'The Assessment and Rating of Noise from Wind Farms'² for the DTI in 1996, acted as peer reviewer for the 'Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise'³, and contributed to the RenewableUK work on Amplitude Modulation.

8. The INWG's critique of the WSP BEIS report is highly critical. (Note: Susan Crosthwaite and Melvin Grosvenor are members of INWG.)

The critique's introduction states: (Note: Text quoted from the WSP report, website or LinkedIn page is shown in *blue italics*. Text quoted from other documents is shown in *black italics*. INWG comments or statements are shown in **red and highlighted in grey**.)

“The report titled; ‘[A review of noise guidance for onshore wind turbines](#)’ was released by acoustic consultant WSP on their company website on 10 February 2023 with an announcement appearing on the WSP LinkedIn social media page, [open here](#). An initial review of the web site report summary, [open here](#) raised some serious concerns regarding the integrity, impartiality and accuracy of this report to Government. As a result, the INWG decided to conduct an analysis of the WSP report.

At 400 pages in length, two or three times longer than needed, repetitive and with an excess of jargon it will dissuade all but the most determined reader to properly evaluate the findings. When we analyse the report, its methodology, authors and invited stakeholders it is concluded this review of ETSU-R-97 is biased with conflicts of interest throughout.

The stakeholder engagement survey at section 4 of the report, is arguably the most important workstream within the review. Whereas the engagement objectives would appear to be reasonable, the implementation is judged to be deficient and compromised by bias. The survey composition of the ‘by invitation only’ stakeholders creates a bias in favour of the wind industry and is particularly imbalanced as it excludes those with direct experience of living near wind turbines and their representatives.

Despite this overwhelming evidence from the stakeholder survey that ETSU-R-97 has failed, WSP chose to include the written statement from two professional associations (see pages 162 and 163), which recommended to continue with the use ETSU-R-97. The unnamed professional associations in making this statement demonstrate their denial of the shortcomings of using ETSU-R-97 and denigrate the so-called ‘objector groups’. This would appear to be an unprofessional attempt to pressure government to retain ETSU-R-97 and to prevent independent scrutiny.”

8.1. Furthermore, INWG note:

It is evident from this statement that the unnamed professional associations are in denial of the shortcomings with ETSU-R-97. Additionally, they have denigrated the so called ‘objector groups’ with the misleading statement;

*“The fact that onshore wind development in the UK has attracted little adverse attention from those worried about noise does not mean that such an announcement would not stir up considerable interest from **objector groups with no factual or scientific basis for their assertions.**”*

This assertion by the WSP authors is deeply concerning, as it has no basis in reality and is seeking to unjustifiably undermine one of the recommendations of the WHO's 2018 European Environmental Noise Guidance, which is discussed within this report.

This inquiry report will also contest this unfounded statement by submitting substantive scientific evidence which directly challenges the WSP report statement.

8.2. INWG's critique also draws further attention to the report's deeply concerning survey response methodology and analysis:

In summary, Figures 4-5, 4-6 and 4-7 provide a clear indication that there are concerns with many aspects of the guidance. The wind industry professional associations consider that these concerns can be overcome with some updating, and that others, mostly the LPAs and the civic group consider that the guidance requires substantial revision.

Additionally, WSP conducted interviews with a few selected respondents that seems to have complicated the analysis and introduced an additional layer of topics. The report does not identify which stakeholders were interviewed or even how many out of the 31 were interviewed.

In conducting these interviews to a likely small number of stakeholders in this way, WSP will have created an uneven playing field with either bias or perceived bias favouring the wind industry.

8.3. Likewise, the INWG raises further concerns:

It should be recognised that this stakeholder survey included 31 respondents of which only one, the INWG might be described as an 'objector group'. Almost all the issues raised by stakeholders to question 1.4 as discussed above came from the other 30 respondents. The statement from these two wind industry professional associations ends with; "*While we do not feel there is a need for new UK wind turbine noise assessment guidance, any further modifications should include a panel of expert acousticians, wind farm, developers, government representatives and the IOA*".

It is therefore of further concern that the suggested panel fails to include audiologists, physicians or representatives of communities negatively impacted by wind turbine noise. (my emphasis)

This statement on page 162 and 163 by the wind industry would appear to be an unprofessional attempt to retain ETSU-R-97 as the official noise guidance and to prevent independent scrutiny.

8.4. In summary, INWG further question the standing and validity of the WSP report and recommendations:

When we delve into the report and identify the authors and stakeholders we see that central government, local government and the wind industry including their acousticians are the only participants other than the INWG. Even the appointed 'peer reviewer' is one of the original authors of the ETSU-R-97 guidance and has been closely associated with the wind industry for over two decades. There being no other independent stakeholders identified and the INWG is aware of several unsolicited survey responses have not been acknowledged or included in the review.

It is concluded this review of ETSU-R-97 by WSP is biased throughout in its methodology and execution.

Also of note, INWG state:

On an earlier version of their website, WSP proudly claimed their experience with onshore wind projects stating, "*We have a long track record supporting wind developers, utilities, funders and investors throughout the project life cycle.*"

8.5. The question, Rita Holmes also raises along with the INWG 's critique is substantive and requires addressing:

On what basis should medically unqualified acousticians, (as are the authors of the WSP BIES report) opinions on the health and wellbeing of affected residents, become accepted as statement of fact, on which large scale planning decisions are made?

Furthermore, Rita Holmes compelling experience and evidence, more than adequately respond to all of the misleading statements and references in respect of the Hunterston Appeal decision. Appendix 4.

9. The United Nations World Health Organisation (WHO) guidance on environmental noise was revised in October 2018, moving in the opposite direction to the IOAGPG in the matter of infrasound. Its *"Night Noise Guidance for Europe"*, published in 1999, made no mention of Wind Turbine Noise (WTN), whereas the 2018 edition of the WHO Guidance treats WTN at some length. It takes infrasound seriously and comments at length on the paucity and poor quality of available evidence in the matter of the AHEs caused by wind turbines.

9.1. Within Scienteuch EIAR Vol 3 - Technical Appendix 12.2 Issues Scoped Out of Wind Farm Noise Assessment (REPORT - 1284515 – 2 at Para A12.2.24, RES state:

With regard to health effects, the DTI report quotes the document 'Community Noise', prepared for the World Health Organisation (WHO), which states that 5:

"there is no reliable evidence that infrasound below the hearing threshold produce physiological or psychological effects".

Details of the date and reference of The WHO Community Noise is extracted below:

This WHO document on the *Guidelines for Community Noise* is the outcome of the WHO-expert task force meeting held in London, United Kingdom, in April 1999. It bases on the document entitled "Community Noise" that was prepared for the World Health Organization and published in 1995 by the Stockholm University and Karolinska Institute.

In fact this extremely dated report published in 1999, states; *Since 1980 WHO has addressed the problem of Community Noise. In 1992 the WHO regional office for Europe convened a task force which set up Guidelines for Community Noise presented in this document.*

The Preface extract below, sets out the perimeters of the objectives of the guidelines.

Preface

Community noise (also called environmental noise, residential noise or domestic noise) is defined as noise emitted from all sources except noise at the industrial workplace. Main sources of community noise include road, rail and air traffic, industries, construction and public work, and the neighbourhood. The main indoor sources of noise are ventilation systems, office machines, home appliances and neighbours. Typical neighbourhood noise comes from premises and installations related to the catering trade (restaurant, cafeterias, discotheques, etc.); from live or recorded music; sport events including motor sports; playgrounds; car parks; and domestic animals such as barking dogs. Many countries have regulated community noise from road and rail traffic, construction machines and industrial plants by applying emission standards, and by regulating the acoustical properties of buildings. In contrast, few countries have regulations on community noise from the neighbourhood, probably due to the lack of methods to define and measure it, and to the difficulty of controlling it. In large cities throughout the world, the general population is increasingly exposed to community noise due to the sources mentioned above and the health effects of these exposures are considered to be a more and more important public health problem. Specific effects to be considered when setting community noise guidelines include: interference with communication; noise-induced hearing loss; sleep disturbance effects; cardiovascular and psycho-physiological effects; performance reduction effects; annoyance responses; and effects on social behaviour.

It is clearly apparent there is **NO** reference to wind turbine noise. All other main sources of community noise are considered, including barking dogs. Indeed the an extract below of the Introduction does not identify Wind Turbines, as at that time there were very few turbines operating within quiet rural environments.

1. Introduction

Community noise (also called environmental noise, residential noise or domestic defined as noise emitted from all sources except noise at the industrial workplace. Major sources of community noise include road, rail and air traffic; industries; construction and public transport and the neighbourhood. The main indoor noise sources are ventilation systems, office equipment, home appliances and neighbours.

9.2. However, it is abundantly clear that the WHO in 1999 recognised that sleep disturbance was and still is a fundamental concern especially in quiet rural locations.

Sleep disturbance is a major effect of environmental noise. It may cause primary effects during sleep, and secondary effects that can be assessed the day after night-time noise exposure. Uninterrupted sleep is a prerequisite for good physiological and mental functioning, and the primary effects of sleep disturbance are: difficulty in falling asleep; awakenings and alterations

of sleep stages or depth; increased blood pressure, heart rate and finger pulse amplitude; vasoconstriction; changes in respiration; cardiac arrhythmia; and increased body movements. The difference between the sound levels of a noise event and background sound levels, rather than the absolute noise level, may determine the reaction probability. The probability of being awakened increases with the number of noise events per night. The secondary, or after-effects, the following morning or day(s) are: reduced perceived sleep quality; increased fatigue; depressed mood or well-being; and decreased performance.

For a good night's sleep, the equivalent sound level should not exceed 30 dB(A) for continuous background noise, and individual noise events exceeding 45 dB(A) should be avoided. In setting limits for single night-time noise exposures, the intermittent character of the noise has to be taken into account. This can be achieved, for example, by measuring the number of noise events, as well as the difference between the maximum sound level and the background sound level. Special attention should also be given to: noise sources in an environment with low background sound levels; combinations of noise and vibrations; and to noise sources with low-frequency components.

- 9.3. It is also notable that WHO state; **Special attention should also be given to: noise sources in an environment with low background sound levels; combinations of noise and vibrations; and noise sources with low frequency components.**

The question is then, why are the wind industry acousticians constantly seeking to down play residents complaints and deny the health impacts from adversely impacted residents, especially those who suffer severe sleep disturbance?

Can it really be the case that all other sources of noise nuisance from whatever source rightly needs to be addressed, but only wind turbine noise is benign and causes no ill effects?

- 9.4. It is also the case that the latest European Environmental Noise Guidance 2018, has superseded the extremely dated 1999 Community Noise Guidance, to which RES refer, in respect of infrasound/low frequency noise.

Therefore, RES statement at: A12.2.38 *The Environmental Noise Guidelines for the European Region*²⁹, published by the WHO in 2018, are described as complementary to the Night Noise Guidelines and state that:

"No statistically significant evidence was available for sleep disturbance related to exposure from wind turbine noise at night.", is not applicable.

The latest and updated WHO 2018 Environmental Noise Guidance **did not indicate** that there was; **no evidence that any infrasound/low frequency noise from wind turbines directly causes health impacts.** Again, to assume otherwise, is to significantly misrepresent the content and context of the Noise Guidance.

To clarify, extracts from the updated WHO 2018 Noise Guidance are copied below:

*"The current evidence on health outcomes related to wind turbine noise is unavailable, or of low/very low quality and mainly comes from cross-sectional studies. **Methodologically robust longitudinal studies with large samples investigating the quantitative relationship between noise from wind turbines and health effects ARE NEEDED.**" (Emphasis added). It is abundantly clear completely independent scientific research is desperately needed.*

Importantly, there is a significant step forward in an admission by WHO on Page 85 of the 2018 Guidance, that;

*"Wind turbines **can generate infrasound or lower frequencies of sound** than traffic sources. However, few studies relating exposure to such noise from wind turbines to health effects are available. It is also unknown whether lower frequencies of sound generated outdoors are audible indoors, particularly when windows are closed"*

Both of these statements by WHO acknowledge there is a need for further studies and that wind turbines can generate infrasound, or lower frequencies of sound.

This evidence from the WHO totally contradicts the unfounded claim by the WPS authors;

Overall, the findings from the existing evidence base indicate that infrasound from wind turbines at typical exposure levels has no direct adverse effects on physical or mental health, and reported symptoms of ill-health are more likely to be psychogenic in origin.

- 9.5. It is abundantly clear, completely independent scientific research free of any bias or predetermined outcomes is desperately needed. With an ever-growing number of wind turbines close to homes there is so much potential to research the impacts of the full acoustic environment as part of Conditions of Consent. It is imperative that local communities have full confidence in the transparent independence of the research..

RES have not accepted nor adequately responded to the unacceptable WTN pollution that will potentially impact the residents surrounding this application. They just continue to down play the legitimate and seriously debilitating complaints.

Yet the UK Government - solely responsible for Wind Turbine noise guidance, and Scottish Devolved Assembly– responsible for planning, have done nothing to address this unsatisfactory situation, which is putting at risk the health and welfare of adversely impacted wind turbine neighbours living in the vicinity of ever larger and more powerful generating machines.

- 9.6. The proposed turbines power generation, height of the blade tips and rotor diameters all require careful assessment when considering impacts on residential amenity, especially in relation to the nearest affected residents given that there is no assessment of turbines of this size and capacity, in operation onshore, in the UK. Indeed, there is also no operational evidence that the proposed unprecedented turbines of this size and scale can be safely operated onshore close to residential properties, in respect of wind turbine noise impacts.

ETSU and the IOAGPG and the subsequent conditions when approved at planning, do not provide the guaranteed protection required to make living close to this proposed development. Conditions of consent are not providing adequate protection. Turbines have increased from under 50 meters to up to 250 meters plus, and power output from under 1MW to more than 7 MW, without any notable review of WTN health impacts. ETSU R 97 only provides for outdated planning conditions, introduced in 1997 when turbines were up to six times smaller and six times less powerful.

- 9.7. The WHO 2018 Guidance also stated:

"Wind turbine noise is characterized by a variety of potential moderators, which can be challenging to assess and have not necessarily been addressed in detail in health studies. As a result, there are serious issues with noise exposure assessment related to wind turbines."

and further,

*"The noise emitted from wind turbines has other characteristics, including the repetitive nature of the sound of the rotating blades and atmospheric influence leading to a variability of amplitude modulation, which can be a source of above average annoyance (Schäffer et al., 2016). This differentiates it from noise from other sources and has **not** always been properly Characterized.".*
*Standard methods of measuring sound, **most commonly including A-weighting, may not capture the low-frequency sound and amplitude modulation** characteristic of wind turbine noise (Council of Canadian Academies, 2015).*

- 9.8. It is clear from WHO statements that ETSU - R - 97, is not adequate to assess the full Characterisation of WTN, in this context Table 42 is informative and identifies failures of adequate research and the ongoing consequences to the health and wellbeing of residents.

It is clear from WHO statements that ETSU - R - 97, is not adequate to assess the full Characterisation of WTN, in this context Table 42 is informative and identifies failures of adequate research and the ongoing consequences to the health and wellbeing of residents.

Table 42. Summary of the assessment of the strength of the recommendation

| Factors influencing the strength of recommendation | Decision |
|--|--|
| Quality of evidence | <p>Average exposure (L_{den}) <i>Health effects</i></p> <ul style="list-style-type: none"> Evidence for a relevant absolute risk of annoyance at 45 dB L_{den} was rated low quality. <p><i>Interventions</i></p> <ul style="list-style-type: none"> No evidence was available on the effectiveness of interventions to reduce noise exposure and/or health outcomes from wind turbines. <p>Night-time exposure (L_{night}) <i>Health effects</i></p> <ul style="list-style-type: none"> No statistically significant evidence was available for sleep disturbance related to exposure from wind turbine noise at night. <p><i>Interventions</i></p> <ul style="list-style-type: none"> No evidence was available on the effectiveness of interventions to reduce noise exposure and/or sleep disturbance from wind turbines. |
| Balance of benefits versus harms and burdens | Further work is required to assess fully the benefits and harms of exposure to environmental noise from wind turbines and to clarify whether the potential benefits associated with reducing exposure to environmental noise for individuals living in the vicinity of wind turbines outweigh the impact on the development of renewable energy policies in the WHO European Region. |
| Values and preferences | There is wide variability in the values and preferences of the population, with particularly strong negative attitudes in populations living in the vicinity of wind turbines. |
| Resource implications | Information on existing interventions (and associated costs) to reduce harms from wind turbine noise is not available. |
| Additional considerations or uncertainties | There are serious issues with noise exposure assessment related to wind turbines. |
| Decisions on recommendation strength | <ul style="list-style-type: none"> Conditional for guideline value for average noise exposure (L_{den}) Conditional for the effectiveness of interventions (L_{night}) |

Comments in respect of Table 42:

Balance of benefits versus harms and burdens

Further work is required to assess fully the benefits and harms of exposure to environmental noise from wind turbines and to clarify whether the potential benefits associated with reducing exposure to environmental noise for individuals living in the vicinity of wind turbines outweigh the impact on the development of renewable energy policies in the WHO European Region.

WHO simply does not indicate (as repeatedly stated by all wind industry acousticians):

'that there is no evidence that any infrasound/low frequency noise from wind turbines directly causes health impacts or can otherwise impact on the amenity of those living or working near wind turbines'. WHO consistently states further research work is needed.

Values and preferences

There is wide variability in the values and preferences of the population, with particularly strong negative attitudes in populations living in the vicinity of wind turbines.

9.9. Comment: The fundamental question that needs to be asked is, why is WHO reporting there is:

"particularly strong negative attitudes in populations living in the vicinity of wind turbines"?

This cannot and must not be explained away by wind turbine operators, by ignoring, or even denying that residents complaints are not substantive, or genuine or, that they may have been predisposed to complain, because they don't like wind turbines due to campaign groups and media exposure or, are stressed because they objected to the consented development, or influenced by; '*non-acoustical factors*', as has been unacceptably postulated in the 2016 WSP/Parsons Brinkerhoff AM Report to Government at Para 3.3.87.

9.10. **WHO Identified Need and Implications for Further Research on Health Impacts from Wind Turbine Noise.**

Paragraph 4.2 states:

Further research into the health impacts from wind turbine noise is needed so that better-quality evidence can inform any future public health recommendations properly. For the assessment of health effects from wind turbines, the evidence was either unavailable or rated low/very low quality. Recommendations for research addressing this priority are proposed in Table 53.

Extracts from Table 53 are copied below;

Table 53. Implications for research on health impacts from wind turbine noise

| | |
|--------------------------------------|--|
| Current state of the evidence | The current evidence on health outcomes related to wind turbine noise is unavailable or of low/very low quality and mainly comes from cross-sectional studies. Methodologically robust longitudinal studies with large samples investigating the quantitative relationship between noise from wind turbines and health effects are needed. |
| Population of interest | Research is needed into effects of exposure on children and adults exposed and living near sources of wind turbine noise. Studies should assess subgroup differences in effects for vulnerable groups such as children, elderly people and those with existing poor physical and mental health. |
| Exposure of interest | Exposure to noise at a wide range of levels and frequencies (including low-frequency noise) with information on noise levels measured outdoors and indoors (particularly relevant for effects on sleep) at the residence is needed. The noise exposure should be measured objectively and common protocols for exposure to wind turbine noise should be established considering a variety of noise characteristics specific to wind turbine noise. |

9.11. It is apparent the recommendations of WHO 2018 Noise Guidance has been largely ignored by the wind industry and policy/decision makers within Government. There are consistent calls by impacted residents whose complaints are not being addressed and resolved.

Table 53 particularly states:

"Research is needed into effects of exposure on children and adults living near sources of wind turbine noise",

yet the wind industry acousticians as evidenced in the WSP BEIS report are **deliberately** avoiding this serious public health matter.

In addition, it is extremely concerning that whilst WHO specifically state:

*Exposure to noise at a wide range of levels and frequencies (**including low - frequency noise**), with information on noise levels measured outdoors and indoors (particularly relevant for effects on sleep) **at the residence is needed.***

9.12. Compared with the WHO recommendations the INWG WSP critique (**CD.SS8**) confirms:

At page 116, WSP claim:

"Overall, the findings from the existing evidence base indicate that infrasound from wind turbines at typical exposure levels has no direct adverse effects on physical or mental health, and reported symptoms of ill-health are more likely to be psychogenic in origin".

On what basis should medically unqualified acousticians, (as are the WSP authors) opinions on the health and wellbeing of adversely affected residents, become accepted as a statement of fact, on which large scale planning decisions are made and on which government policy is determined?

Furthermore the WSP Report repeated at Par 3.1 - Statement of Agreed Matters is unacceptably fundamentally flawed by stating:

3.1 We note the WSP BEIS report considered the topics of infrasound and low frequency noise and the advice contained therein. Whilst it may be feasible to measure infrasound from wind turbines⁹, the current weight of evidence (see WSP BEIS report) indicates that wind turbine infrasound has no adverse effects on human health at typical exposure levels and that it is not necessary to consider wind turbine infrasound when determining development applications.

Furthermore, assessment on the basis of 'A' weighted sound levels (the approach in the ETSU-R-97 assessment methodology) provides sufficient control over the potential impact of low frequency noise.

This statement is totally contradicted by the WHO which state:

Standard methods of measuring sound, most commonly including A-weighting, may not capture the low-frequency sound and amplitude modulation characteristic of wind turbine noise (Council of Canadian Academies, 2015).

9.13. The INWG WSP critique extract below, references the following:

Then at page 232, WSP are mischievously recommending that government make a position statement indicating that;

"infrasound from wind turbines at typical exposure levels has no direct adverse effects on health".

These conclusions and recommendation are completely at odds with the evidence review findings by the INWG at Work Package 2.1, open here and more recent evidence, bringing to mind the age old saying; *"The absence of evidence is not evidence of absence"*.

and;

The INWG findings from 2015 are summarised in the WP 2.1 Executive Review at Para 5;

"The evidence regarding low frequency noise (LFN), a significant component of WTN including AM, is compelling. Despite the wind industry's continual denial of the significance of LFN, the available evidence demonstrates conclusively that:

- LFN including infrasound is an integral component of WTN;
 - Complaints regarding WTN currently classified as AM or EAM or OAM by the wind industry is an obfuscation of the true nature of the problem;
 - Conditions giving rise to noise complaints are often characterised by 'sensation' as being the major form of disturbance. In some cases, the 'noise' may not even be audible;

- **Noise measurement using the A weighting may be unsuitable for WTN where low frequency components are present;**
- Noise measurements should be made inside homes when investigating noise complaints;
- Noise measurements where LFN is present should be made using suitable instrumentation. IEC 61672 compliant 'Class 1', instrumentation may be unsuitable for LFN measurement or where background noise levels are low as in typical rural areas."

9.16 In conclusion: INWG's critique (**CD.SS8**) provide substantive evidence to this Conjoined Inquiry and;

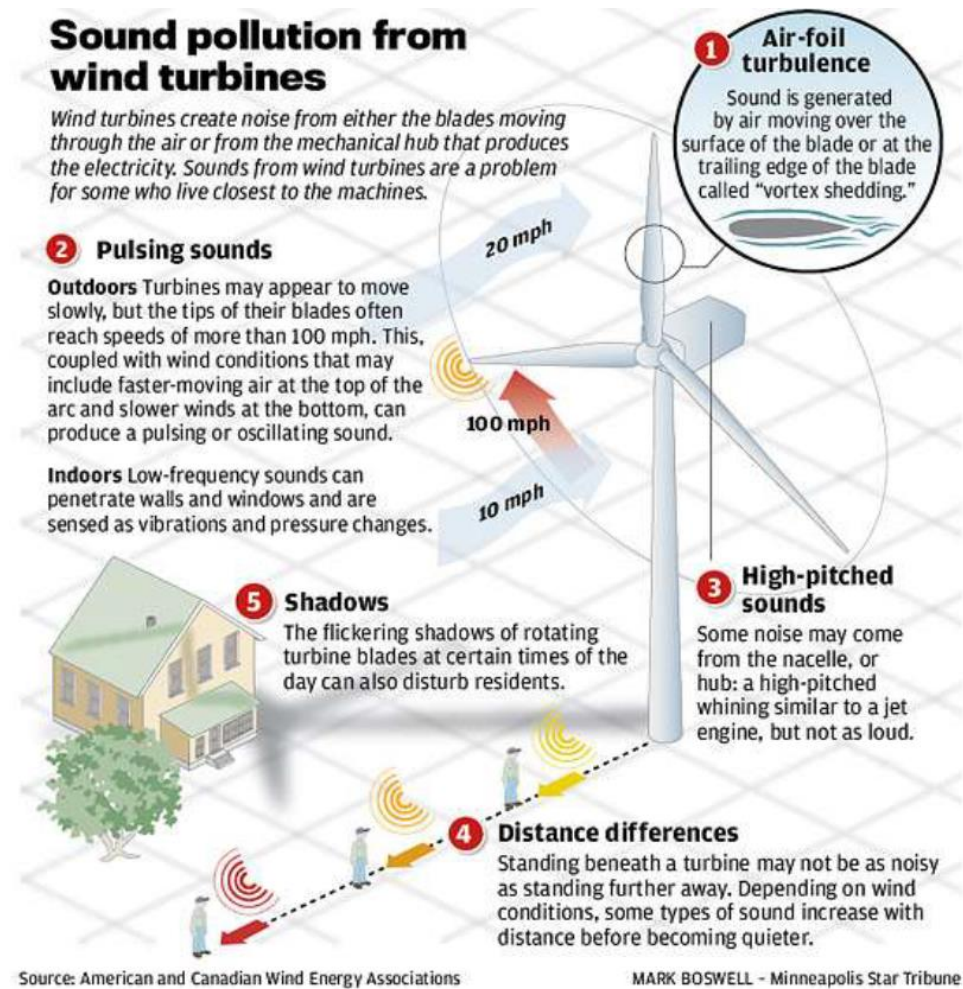
Following this review of the WSP report, the INWG make the following recommendations to Government, expanded below;

| | |
|--------------|---|
| ONE | Reject the recommendations made by WSP in their review for ETSU-R-97 to be retained albeit with some revisions. |
| TWO | Replace ETSU-R-97 with BS4142:2014+A1:2019 as the official guidance for wind turbine noise assessment. |
| THREE | Reject the WSP suggested proposal for a government position statement on low frequency noise. This proposal is unsupported by the evidence and would conflict with the World Health Organisation (WHO) position. |
| FOUR | Conduct independent research into the effects on health and well-being of wind turbine noise including impacts from long term exposure, low frequency noise, infrasound, amplitude modulation and tonal noise as recommended by the WHO. |
| FIVE | Introduce licencing and regulation of wind power generation by a national agency such as the Environment Agency. This to include continuous monitoring and recording of noise and turbine data (SCADA) with the data available for compliance and complaint purposes. |

10. It is of immense concern that acousticians, including those (unnamed) from Natural Power representing RES, continue to scope out and postulate the unsound position as stated within the WSP BEIS report that; "*indicates that wind turbine infrasound has no adverse effects on human health at typical exposure levels and that it is not necessary to consider wind turbine infrasound when determining development*

applications". Furthermore, assessment on the basis of 'A' weighted sound levels (the approach in the ETSU-R-97 assessment methodology) provides sufficient control over the potential impact of low frequency noise".

10.1. How is it scientifically possible, when only assessing 'A weighted' data to possibly be able to understand or have 'sufficient control' of the impact of the full acoustic environment on the health and well-being of those living in close proximity. 'A Weighted' is explained below:



10.2. **Acoustic pollution** Wind Turbine noise, vibrations and infrasonic pulsations cause turbine sickness and sleep disturbance.

Turbines are distinctively noisy in rural areas, particularly during certain times of the year when the atmospheric conditions increase noise transfer. In the Bald Hills court case, Justice Richards did not consider the industrial wind development as one of the established uses in the locality.

“The locality is rural, relatively quiet, and remote..... The rural activities of stock grazing and farm activities do not cause intrusive noise at night”

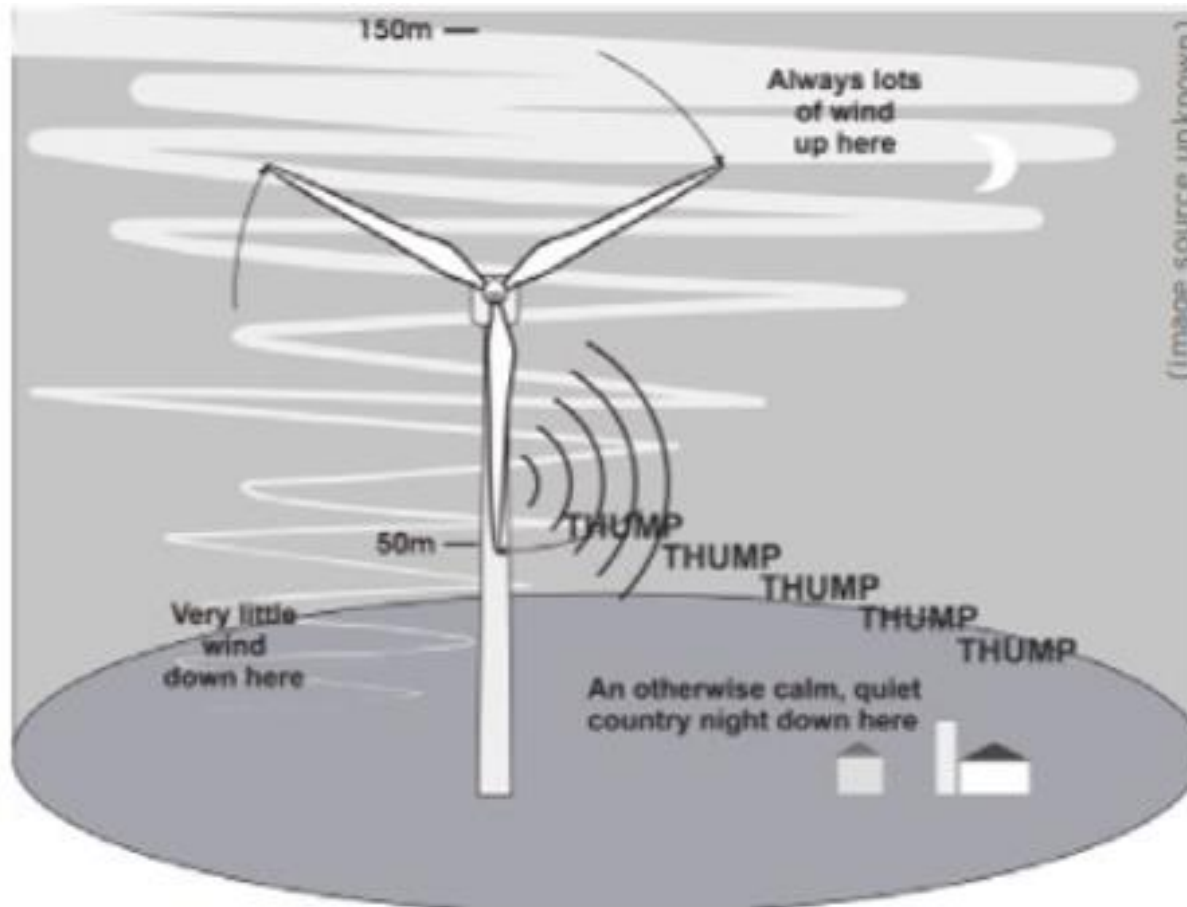
The grinding sounds of the gear boxes adjusting the blade angles, and the screeching of the brakes controlling the yaw, wake people up at night – And residents often can't get back to sleep.

In some bedrooms the noise is amplified by room resonances.

Turbines also vibrate in the ground. The long blades leveraged off the towers cause the towers to vibrate and shudder. The propagation of vibration is dependent on the geology of the area.

These vibrations can be transmitted through the ground to the houses, up through the foundations, walls, and floors, into the bedroom and through the pillows.

Demonstration of operational compliance with WTN conditions does not necessarily establish that turbine noise over many periods of time, does not cause a distressing nuisance.

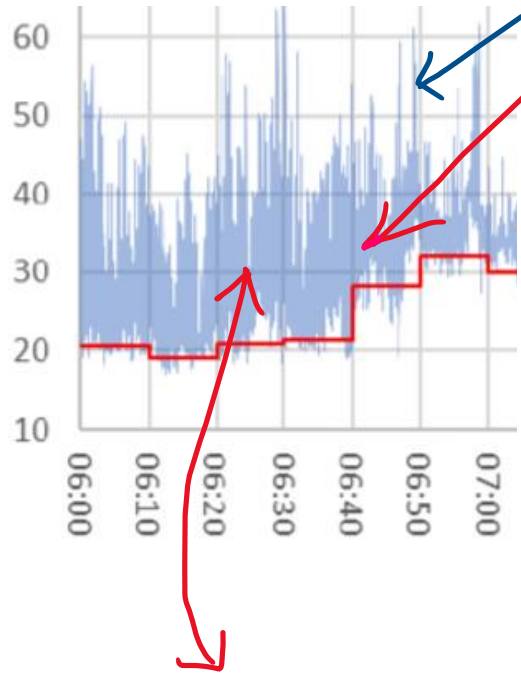


10.3. ETSU assumes wind farm noise is constant – it is not – it is intermittent.

From a distance, smaller turbines were heard as a constant low hum, like the hum of road traffic noise from a distant highway. These Scienteuch turbines are six times the size and located at distances of only 1-2 kms from homes.

10.4. The LA90 statistical calculation is used in ETSU-R-97 as a proxy that minimises short term noise events from certain types of extraneous noise, such as bird song or occasional passing local traffic but assumes that wind turbine operational noise is constant. Unfortunately, wind turbine noise from a wind farm is not constant in tone or amplitude, yet this

Below is a graph of monitored operational turbine noise from wind farm.



Noise Recordings - *These are the Noise Levels you hear.*

The LA90(10min) level - *This Is the Noise they say you hear.*

The LA90 (10min) statistical level is the lowest 10% level of the noise measured for that 10 minute period.

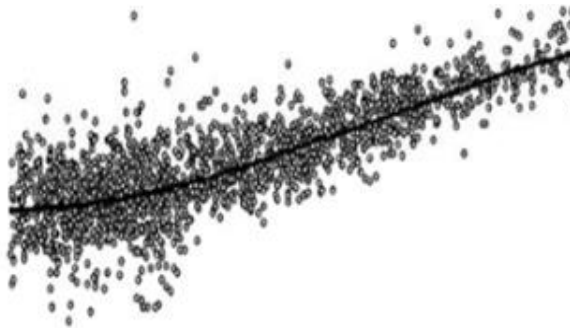
The LA90(10min) statistical level hides 90% of the noise.

It hides the high noise you hear.

This hidden noise occurs in each 10 minute period.

This is the noise that wakes people up at night.

This is the noise that causes the nuisance.



The LA90(10min) statistical level is plotted as a data point (dot) on a graph.

A data point is the quietest 10% of noise in a 10 min period of noise monitoring.

90% of the noise in any 10minute period is hidden behind every data point.

How is it possible from this data to ensure wind turbine neighbours are protected from noise nuisance?

- 10.5. The implementation of the ETSU guidance fails to robustly assess intermittent noise, or noise on individual nights. This is due in part by the use of LA90 and in part by the use of averaging through trend analysis of scatter charts, covering survey periods of weeks that averages out high impact periods on particular days or nights. This is like suggesting that a loud noise event like a gun shot is averaged out over TEN MINUTES which would negate the full impact of the Intermittent loud noise event.
11. Scientific evidence is accumulating from all over the world evidencing that inaudible low frequency noise and vibration is contributing to the misery being experienced by affected residents. These residents being a rural based minority are least able to mount the expensive legal challenges to the acoustic intrusions into their lives.

11.1. Our team Includes Professor Mariana Alves Pereira Professor Degree in Physics, Masters in Biomedical Engineering and Doctoral in Environmental Sciences

The IARO Report⁷ prepared for the Conjoined Public Inquiry Concerning: WIN 370-4 Craiginmoddie Wind Farm, Dailly, South Ayrshire, KA26 WIN 370-5 Carrick Wind Farm, South Ayrshire, KA19 WIN 370-6 Knockcronal Wind Farm, Knockcronal, Straiton, South Ayrshire, considered scientific data in the acoustic environment in the locality of Straiton.

High-resolution recordings of low-frequency sound and infrasound were obtained at several locations near these proposed WPPs.

The purpose of these recordings was to document the baseline Soundscape prior to, and in anticipation of, a formal consent for these proposed WPPs.

The presence or absence of existing Wind Turbine Acoustic Signatures (WTAS) was determined for each of the locations and their likely sources are indicated.

The following locations are already subjected to WTAS from several other, WPPs: Knockskae Cottage, Glenalla Farm, Little Garroch, Glengennet, Tairlaw House, Glenhead, and Barnfield.

⁷ IARO report

A further WTAS source, with a BPF at or above 1 Hz, affected Knockskae Cottage, Glenalla Farm, Little Garroch, Glengennet, Glenhead and Barnfield. Its source could not be identified.

All locations affected by this unknown source were also affected by a 20-hertz tone, also of unknown origin.

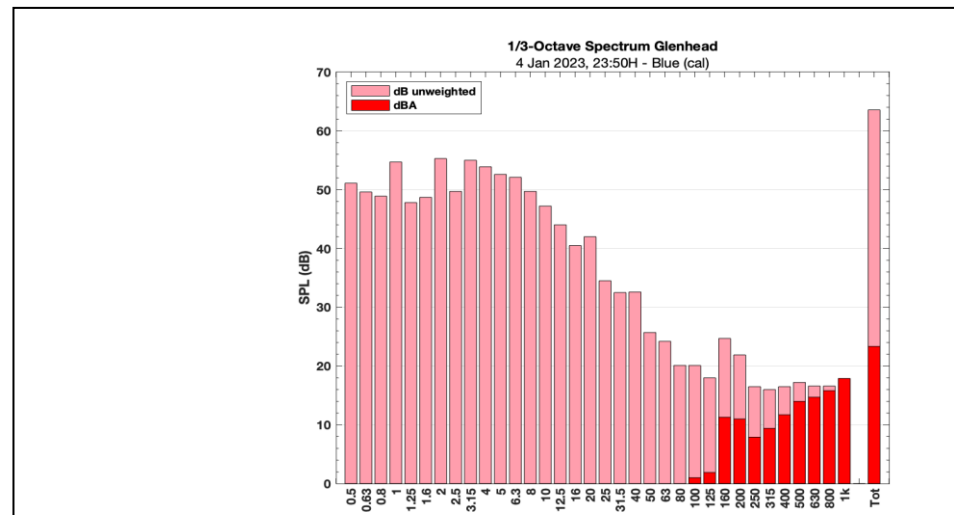
And our goal is: Acoustical monitoring of the baseline soundscape in vicinity of the proposed turbines in anticipation that consent may be granted.

11.2. SAM not only gathers the data in WAV files to be analysed by the IARO team, but it allows us through DAT files to compare the acoustic environment in the field in different weightings including A Weighting, used by acousticians and the wind industry based on a complicated logarithm calculation as stated in ETSU-R-97, and Unweighted data which just shows the full untampered acoustic environment – i.e. what acoustic energy is present at any one time.

11.3. Acousticians normally work with A-weighted sound as this is supposed to align with the human hearing system. In this system the level of each frequency is adjusted to account for the fact that humans are not equally sensitive to all frequencies.

Two examples from a home close to an operational RES development, show the effect of this method on analyses in the infrasound and low-frequency parts of the sound spectrum. **Appendix 6**

The following figure shows a spectrogram with each frequency band 1/3 of an octave wide. Figure 14: from the IARO report page 24: Spectrogram in 1/3 octaves for the Blue microphone from Glenhead from 23:50H 4 January 2023. **Unweighted (pink) and A-weighted (red). The total energy is shown in the final bar on the right.** Glenhead is a noise sensitive property close to Scienteuch

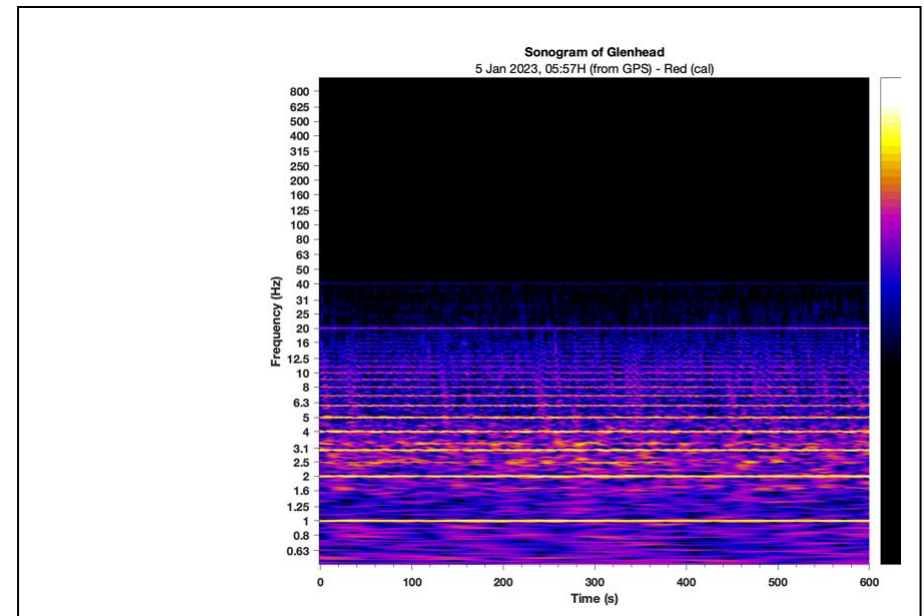
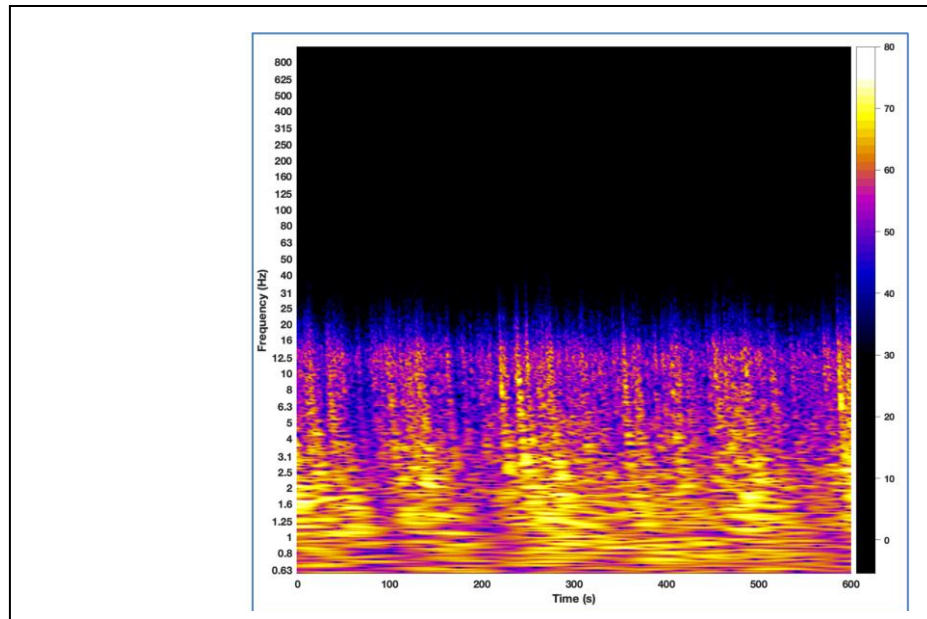


11.4. Natural Infrasound versus Infrasound from Industrial Wind Turbines

Sound is created by a series of troughs and peaks in air pressure. The frequency or pitch of the sound is measured by the number of peaks that arrive in each time interval. For audible noise the peaks arrive closer together than in infrasound, which is why we can hear it. The distance between peaks, the wavelength, is in the order of centimetres. Humans hear well at 3000Hz (3000 peaks per second). Babies cry at 3500Hz.

To protect against a noise the thickness of a barrier must be at least in the same order as the wavelength. This would be centimetres for audible noise, which is achievable. But at 20 Hz the wavelength is 17 metres, so we do not have the means of creating a barrier of sufficient thickness to protect from the lower frequencies. Consequently, low frequency sound will travel through objects and may cause them to resonate in response to the sound stimulation as well.

It is asserted in Technical Appendix 12.2.2: Issues Scoped Out of Wind Farm Noise Assessment that infrasound generated by IWT is no different to that found in urban or natural environments.



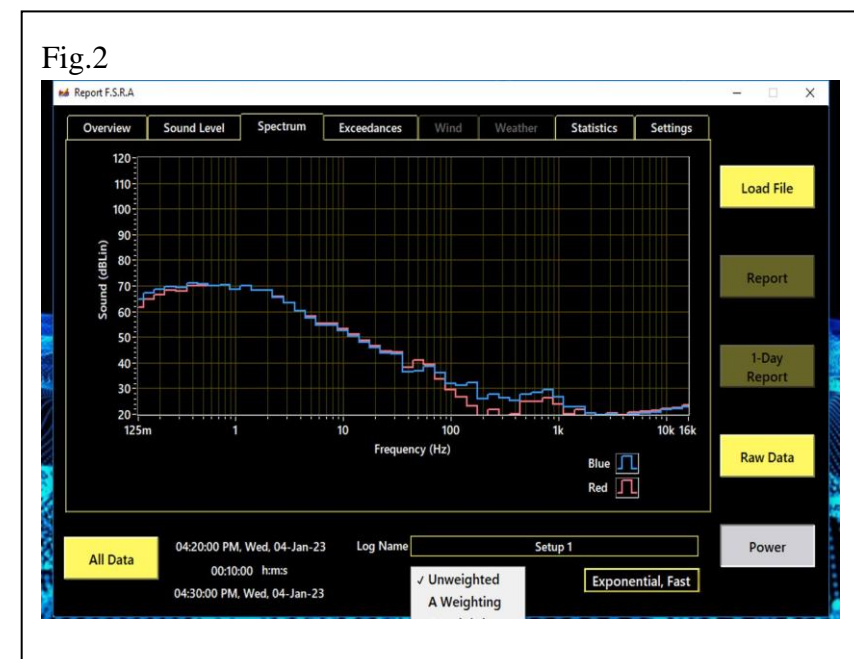
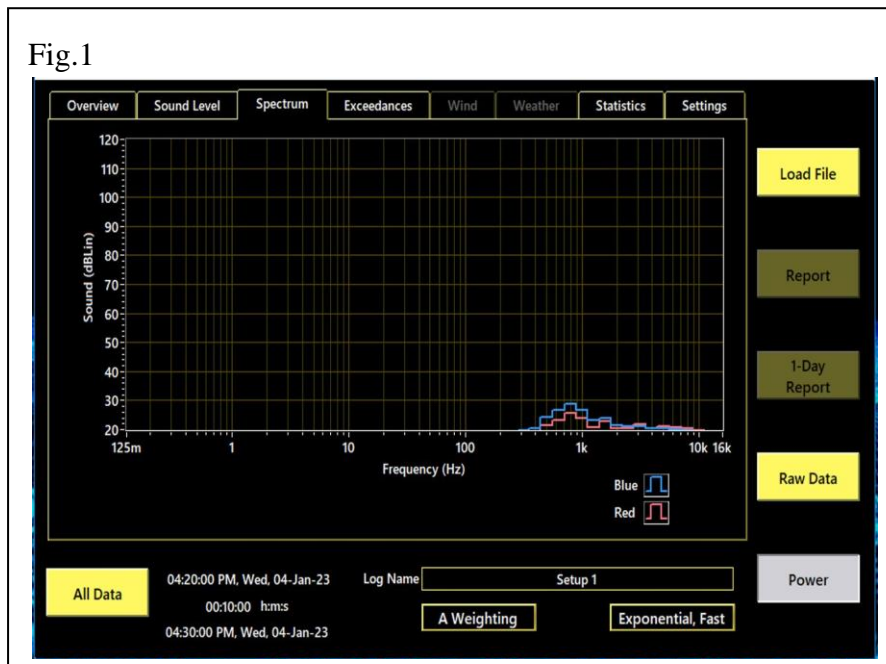
There is a clear difference when comparing the natural acoustic environment of the ocean, (Sonogram of Romo Beach, Denmark on 13th December 2016 seen on the left) with the figure of a Glenhead residence close to Dersalloch where the acoustical output of the operational IWT is captured as a mathematical pattern (see IARO analysis page 37).

The time scale of the peaks associated with the IWT acoustic signature are of a different time scale than the peaks associated with natural phenomena.

Harmonic series with fundamental acoustic signatures as seen at most of the homes in the vicinity of the three applications dominate the harmonic analysis (peaks with red dots) and the horizontal lines in the sonograms – see SS..... *V paragraphs 68-75 and Figures 12 and 13*

The fact the peaks associated with the IWT acoustic signature occur in a mathematical sequence with a blade pass frequency indicates that this can only be originating from a human-made machine, and not Nature. This is confirmed by looking at the shape of the sound waves, which shows a train of pulses (dips) at the blade-pass frequency.

11.5. The acoustic environment when 'AWeighting' is applied Versus the Full acoustic Environment – 'Unweighted'



Above we see two screen shots below of SAM recording data: Figures 1 and 2 from 04.20pm – 04.30am on 4th January 2023 at Glenhead RES noise receptor close to Straiton. Figure 1 shows the acoustic environment when only A weighting is used to examine the data. It shows very low levels of audible noise and nothing in the lower frequencies. Figure 2 is same recording data measurements unweighted showing the full acoustic environment at this location. We can see high levels of acoustic data in the lower frequencies (this could be from Dersalloch wind power plant) compared to low levels of noise in the audible ranges.

12. The following published, peer reviewed Chapter⁸ and Whitepaper⁹ explains more about what this data tells us:

Chapter Infrasound Exposure: High-Resolution Measurements Near Wind Power Plants.

Huub Bakker, Mariana Alves-Pereira, Richard Mann, Rachel Summers and Philip Dickinson.

The Abstract, introduction and conclusion have been included here, but it is essential that the Reporters read the whole chapter.

Abstract

This chapter focuses on infrasonic (20 Hz) noise exposure as captured in and around homes located in the vicinity of wind power plants. Despite persistent noise complaints by local residents, no satisfactory acoustical event has yet been identified to justify this troublesome (worldwide) situation. Continuous (days), high-resolution recordings—spectral segmentation of 1/36 of an octave and 1-second temporal increments— have been acquired in many homes across the world revealing the presence of wind turbine acoustic signatures. These consist of trains of airborne pressure pulses, identified in the frequency domain as harmonic series with the fundamental frequency equal to that of the blade-pass frequency of the wind turbine. This report documents three such cases (Portugal and Scotland). The highest peaks of the wind turbine acoustic signature (up to 25 dB over background noise) occurred within the 0.5–5 Hz window which is classically defined as below the human hearing threshold; and yet these ‘inaudible’ phenomena appear to trigger severe biological reactions. Based on the prominence of the peaks in the harmonic series, a new measure is proposed for use in determining dose–response relationships for infrasonic exposures. This new methodology may be applicable to infrasonic exposures in both environmental and occupational settings.

Introduction

⁸ Peer Reviewed IARO chapter

⁹ IARO White paper

Hearing loss, speech intelligibility and noise annoyance are some of the most studied impacts of noise exposures on human health and well-being. A common denominator of these three outcomes is the audibility of the sound. Exposure to loud noise over extended periods of time can cause hearing impairment; noisy environments can interfere with the correct understanding of speech; and certain types of continuous or intermittent sounds can cause people to feel annoyed by noise, which can, in turn, exacerbate underlying disorders or diseases. There are, however, additional features of sonic environments that are unrelated to the human audibility of sound, but that can also deleteriously affect human health and well-being, specifically, infrasound (20 Hz).

Conclusions

This chapter provides a different approach to the measurement and analysis of infrasound in and around homes located in the proximity of wind power plants. Examples show how using higher temporal- and spectral-resolutions (1 second and 1/36 of an octave), and without any frequency weighting, can reveal acoustical features in the infrasonic range that may indicate a causal relationship with self-reported medical symptoms. This possibility is usually considered non-existent since the infrasonic range is generally viewed as inaudible, and thus innocuous, to humans. The suggestion therefore arises that current noise protection procedures are insufficient to protect public and occupational health. The approach used by these authors offers a more solid framework with which to pursue the establishment of dose–response relationships for infrasonic exposures. Future studies are being extended into noisy occupational environments and different environmental settings where wind power is not the acoustic source.

16. The White Paper. (CD.SS12.)

Preamble Harmonic series are rare in nature. They are far more commonly associated from human activity. This paper looks at several measures that can be calculated from harmonic series, more specifically those that can be calculated from the frequency spectrogram of a recording.

Two separate classes of metrics are considered; those that deal with the SPL of the series and those that deal with the prominence of the series above the sound background.

The definition of prominence for these metrics comes from the Matlab function ‘findpeaks,’ which returns a list of peaks from (in this case) the 1/36th-octave, narrow-band-filter frequency spectrum of a sound file. The prominence of these peaks is defined as part of this function and reproduced in the appendix.

17. It is the responsibility of the wind industry and their acousticians to prove beyond doubt that their turbines will not cause any form of unacceptable environmental acoustic pollution. Just to scope it out in *Technical Appendix 12.2: Issues Scoped Out of Wind Farm*

Noise Assessment; to quote out dated and wind industry sponsored evidence, is a dereliction of their duty to ensure that health and well-being is protected. RES have undeniable, firsthand evidence of their Blary Hill turbines causing unacceptable levels of wind turbine noise pollution adversely impacting on the health and wellbeing of residents living 1km from turbines as this application proposes. For the Councils, SAC and EAC to agree to this, when so many homes are within 2km is irresponsible.

12.3 Consultation

12.3.1 Details of the consultation undertaken are outlined in Table 12.1.

Table 12.1: Acoustic assessment consultation

| Consultees | Date of Consultation | Nature and Purpose of Consultation |
|---------------------------------|----------------------|---|
| East & South Ayrshire Council's | 01/09/21 | Scoping opinion requested from environmental health departments on: proposed methodology, use of previously measured baseline data, maximum scaling factor for use when scaling consented sites to conditioned limits, use of Dersalloch limits and proposed lower fixed limits. |
| East Ayrshire Council | 30/09/21 | Consultation with Council's noise consultant recommended to agree methodology. Low frequency noise and amplitude modulation can be scoped out. |
| South Ayrshire Council | 08/10/21 | Council's consultant agrees with proposed methodology. Proposed maximum scaling factor of 3 decibel (dB) is appropriate. Cumulative limits based on Dersalloch conditioned limits also appropriate. More information on how site-specific shear effects shall be taken into account requested along with justification for proposed lower fixed limits. |
| East & South Ayrshire Council's | 16/11/21 | Planned acoustic assessment at the proposed Scienteuch wind farm (03896-3123105-01) sent to environmental health departments. More detail on background noise survey plus information on how shear effects shall be accounted for and justification for proposed lower fixed limits provided. |
| East Ayrshire Council | 29/11/21 | Response from Council's acoustic consultant. Generally content with proposed approach including fixed limits and cumulative assessment. Further clarification of proposed updated background noise analysis requested. Note that data from High Keirs may not be representative of other properties. |

18. Evidence from our scientific independent monitoring in this area demonstrates that there are already significant acoustic immissions from the operational wind turbines impacting residences. Reference Table 2 from the IARO report (**Appendix 6**).

81. Recordings were taken at the following locations and times during late 2022 and early 2023.

Table 2: SAM 1 recordings and locations.

| Location | Date | Recording Time | Microphone Positions |
|--------------------------|----------------------------------|----------------------|----------------------|
| <u>Knockskae</u> | 14 November 2022 | 1-hour | Both in Bedroom |
| <u>Knockskae Cottage</u> | 21 - 25 November 2022 | Continuous over days | Both in Bedroom |
| <u>Glenalla Farm</u> | 25 - 29 November 2022 | Continuous over days | Both in Bedroom |
| <u>Little Garroch</u> | 29 November – 6 December 2022 | Continuous over days | Both in Art Studio |
| <u>Tairlaw House</u> | 21 - 29 December 2022 | Continuous over days | Both in Work Studio |
| <u>Glenhead</u> | 4 - 7 January 2023 | Continuous over days | Both in Bedroom |
| <u>Glenhead</u> | 10 March 2023 | 4-hours | Bedroom & Outside |
| <u>Glenapp Castle</u> | 13 - 14 March 2023 | Overnight | Bedroom & Bathroom |
| <u>Glengennet</u> | 20 March 2023 | 3-hours | Bedroom & Hallway |
| <u>Glengennet</u> | 24 - 25 Mar 2023 | Overnight | Bedroom & Hallway |
| <u>Barnfield</u> | 3 April 2023 | 4-hours | Bedroom & Garden |

The conclusions from the noise monitoring in the IARO report:

High-resolution recordings of low-frequency sound and infrasound from several locations in the Barr/Straiton area, and subsequent analyses, indicate that the following locations are already subjected to WTAS from several WPPs: Knockskae Cottage R1, Glenalla Farm R2, Little Garroch R3, Glengennet R6, Tairlaw House R4, Glenhead R5, and Barnfield R7.

A further WTAS source, with a BPF at or above 1 Hz, affected Knockskae Cottage, Glenalla Farm, Little Garroch, Glengennet, Glenhead and Barnfield. Its source could not be identified.

All locations affected by this unknown source were also affected by a 20-hertz tone, also of unknown origin.

No sign of WTAS or a pervasive tone were identified High Tralorg R8 or Glenapp Castle. In the former the recording period was too short to suggest that the absence was typical.

18.1. This requires no less than a moratorium on windfarm consents until health impacts are independently studied and ETSU R-97 is replaced.

Why does RES, the Councils or anyone, with any common decency, consider it appropriate to place a large industrial power plant so close to so many homes? 86 listed, (only 6 assumed representative noise receptors where noise monitoring has actually been carried out) in Table 12.9: Location of residential properties and distance to nearest turbine (59 of them within 2.5km).

19. Assessment of Cumulative Effects

12.9.24 Figure 12.2 shows a cumulative noise contour plot for the Proposed Development and the other projects considered in the cumulative assessment calculated using the ISO 9613 Part 2 propagation model. The plot is provided to illustrate the cumulative noise 'footprint' and should be considered indicative only. Where properties are located such that they cannot be downwind of all turbines simultaneously, the predictions made using a downwind propagation model such as ISO 9613-2 are conservative given that reductions in noise would be expected when a property is crosswind or upwind of a noise source.

19.1. Living with wind turbine noise is dose-responsive therefore to suggest that *Where properties are located such that they cannot be downwind of all turbines simultaneously* is a misnomer that residents will experience respite.

19.2. Bullseye Noise Prediction Maps are based on FALSE ASSUMPTIONS.

Wind developers say each contour line or shaded circle represents a noise “limit” distance – this is MISLEADING. Neighbours assume this is the maximum noise level they will hear at their homes – this is WRONG. There are NO Maximum Levels. The contour lines on a bullseye map represent the MINIMUM noise neighbours will hear.

When the noise predictions are wrong – it’s too late, the turbines are up, and the noise nuisance starts.

12.9.13 Noise levels at 57 of the 86 nearest residential properties are below 35 dB(A) level, indicating that the noise immission levels would be regarded as acceptable and the resident’s amenity as receiving ‘sufficient protection’ without further assessment requiring to be undertaken.

12.9.14 There are 29 properties that have predicted noise levels greater than this simplified noise criteria as indicated in Table 12.25. Therefore the ‘full’ acoustic assessment has only been considered at these.

Derived Acoustic Acceptance Criteria

*12.9.15 **Due to the greater generation capacity and therefore increased planning merit of the cumulative development, and in accordance with the guidance provided by ETSU-R-97 and the IoA GPG, a 40 dB(A) daytime lower limit has been adopted. Justification for this limit is as follows:***

- Number of noise affected residential properties: 13 of the considered residential properties are predicted to experience cumulative noise levels of greater than 35 dB(A), although this increases to 28 when the Dersalloch predictions are scaled to their conditioned limits. **This is a small number of properties in relation to the scale of the cumulative development which would generate***

Again people and their lives considered as collateral damage for the ‘greater good’ as stated by SAC in their decision letter:

*Significant effects are likely in terms of residential visual amenity on properties within Gass as they would have views towards the wind turbines. The impact however would not be so significant as to be unacceptable **particularly when weighted against the benefits of renewable energy in tackling the climate crisis.** The adverse effects would not be considered so significant to be detrimental to the enjoyment of the properties given the closest turbine would be at a distance of 1.2km.*

Save Straiton consider this to be unacceptable.



SCLENTEUCH

FIGURE 12.2
CUMULATIVE NOISE FOOTPRINT

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2022 LICENCE NUMBER 0100031673.

Legend

- ⊗ House Locations
- ⊗ Survey Locations
- + Turbine Locations

Predicted Noise Level:

- < 35 dB LA90
- 35 - 40 dB LA90
- 40 - 45 dB LA90
- 45 - 50 dB LA90
- 50 - 55 dB LA90
- > 55 dB LA90



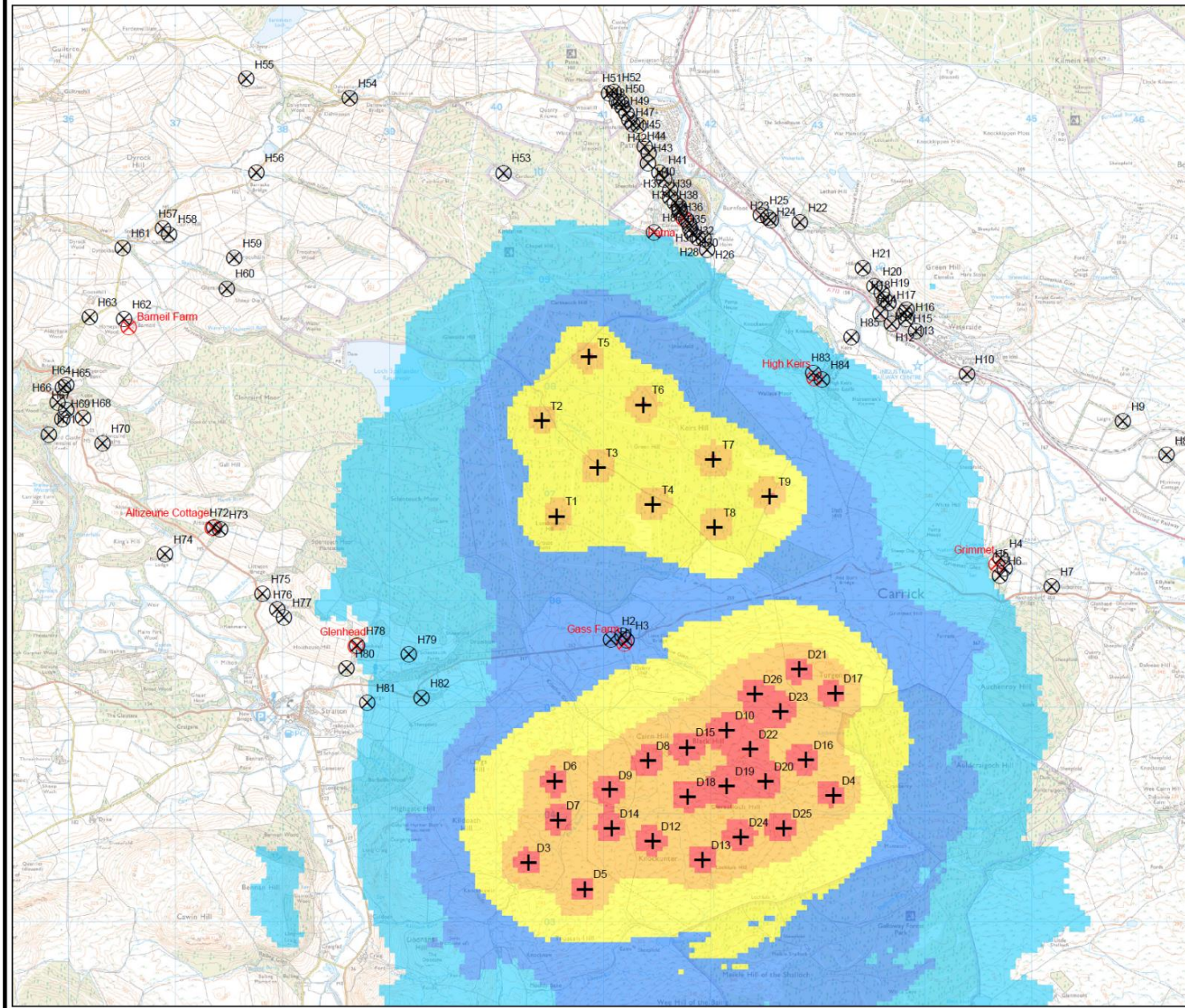
LAYOUT DATE: N/A | PLANSET NO.: PSC0sc026

03896-RES-IMP-DR-TE-002

SCALE - 1:35,000 @ A3

ENVIRONMENTAL STATEMENT & PLANNING APPLICATION 2022

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19.3. Intermittent noise is not shown in the contour maps. It is recognised that amplitude modulation, for example, cannot be reliably predicted, so these contour charts do not indicate how much amplitude modulation will be experienced by neighbours. (Although RES would like to scope this out.

Predictions are LAeq, not LA90 on the assumption that the noise from a wind farm is constant. In reality this is not the case and the LA90 proxy to relate to LAeq does not account for intermittent noise events, such as when a wind turbine rotates with different incoming wind directions. Such intermittent sounds are not a part of the noise models used to generate the noise contour maps.

Living on a 40dB contour line, a neighbour may hear noise levels of 41dB – 60dB (and even higher) at times that is not accounted for when using the LA90 measurement over 10-minute periods.

There is no maximum limit for short duration sounds from wind turbines. 40 dB is the lowest optimistic constant noise level they will hear.

40dB can be exceeded from short term noise events that can occur for 90% of the time.

For a 10 hour period of sleeping, 9 hours of noise will be above the 40dB level and only 1 hour of noise will be below 40dB.

The high spikes of noise are NOT recognised in a LA90 statistical calculation. There is no maximum limit of noise for any contour line.

19.4. How noise is propagated is very dependent on wind speed, direction, topography and the layout of adjacent turbines.

19.5. Justice Richards reaffirms within the Bald Hills judgement: 20220325 Uren v Bald Hills WF [2021] VSC 145ix , the significance of the planning balance between the protection of affected residents residential amenity and the deployment of wind turbines by commenting:

“(6) What is the social and public interest value in operating the turbines to generate renewable energy?

The generation of renewable energy by the wind farm is a socially valuable activity, and it is in the public interest for it to continue. However, there is not a binary choice to be made between the generation of clean energy by the wind farm, and a good night’s sleep for its neighbours. It should be possible to achieve both.”

19.6. The following taken from a letter dated 11th February 2023, from residents living near an operational RES wind farm, to their local councillor complaining about the lack of action by the local council. It illustrates the level of desperation being experienced, quote:

“Life is getting worse here and it is getting unbearable for everyone. Why is [REDACTED] ignoring us, why is no one listening to us, surely our word that this is seriously affecting our health should be enough for [REDACTED] environmental health department to go all out and help us and not say to us that they are stuck between us and RESRES are not suffering , they are not tax payers...we are . We need this to end now, we cannot stand anymore torture. We are pleading for help”

This complaint has not been resolved and these residents are still suffering.....

Scientific evidence is accumulating showing that inaudible low frequency noise and vibration is contributing to the misery being experienced by affected residents. These residents being a rural based minority are least able to mount the expensive legal challenges to the acoustic intrusions into their lives.

19.6. The separation distances to the nearest properties is a matter of material significance.

‘The term ‘residential amenity’ refers to the living conditions at a house, including its gardens and domestic curtilage’.

This NIA report concludes that; *in no case would effects be of such nature and / or magnitude that it potentially affects living conditions at any property to the point it becomes an unattractive place to live, when judged objectively in the public interest.”*

(It is notable that in virtually all NIA's submitted by applicants this conclusion is reached, when in reality these assessments can be found to be fundamentally flawed, as in the Blary Hill wind turbine noise case in Argyll & Bute, which have caused immense harm and distress to the adversely impacted residents and was approved by the Chief Reporter based on the residential amenity assessment.)

Conclusion

This objection has focused on evidence generated from the pure hell created for many forced to envisage or live close to industrial wind turbines as dictated under the current Scottish Government policy. (I do not choose my words lightly).

Scottish Government Planning endorses ETSU-R-97

3.7.4. Until such time as new guidance is produced, ETSU-R-97 should continue to be followed by applicants and used to assess and rate noise from wind energy developments.

This is unjust, immoral guidance which we have a right and a duty to challenge.

Save Straiton For Scotland appeals to the case officer to penetrate the ostensible and refuse this planning application on overbearing Residential Amenity Impacts both visual and Noise.

Appendix 1: CD Save Straiton 15 Bald Hills T0145

Appendix 2: CD. Save Straiton 3 Noise Complaints witness statements pdf

Appendix 3: 517357-290416 Hadyard Hill Meeting Minutes (GL)

Appendix 4 CD 17 23 Matters for Reporters Noise. docx

Appendix 5: CD Save Straiton 7 Hearing Statement Rita Holmes April 2023.pdf

Appendix 6: Commentary on “Wind turbine noise and human health impacts in Fairlie, North Ayrshire” produced by Health Protection Scotland, July 2017. by Mariana Alves-Pereira, Ph.D. August, 2021

Appendix 7 CD Save Straiton 9 IARO Conjoined Inquiry FINAL

Appendix 8 CD Save Straiton 11 IARO chapter 85225

Appendix 9 CD Save Straiton 12 IARO23-1 White Paper on the Harmonic Series Metrics