Boolyduff, Inagh Co. Clare

22 June 2026

To Whom It May Concern,

Re: Case Reference PAX03-324270 – Proposed Slieveacurry Wind Farm

We wish to make this submission in support of our objection to the proposed Slieveacurry Wind Farm.

This is not the first attempt to develop this site. An earlier application by Slieveacurry Limited for a wind farm comprising up to 8 no. turbines on substantially the same site (Clare County Council Reg. Ref. 21/1226) was refused by Clare County Council on 20th January 2022 for four reasons, including injury to the visual amenities of the area, adverse impact on residential amenity by way of noise, disturbance and visual overbearance, adverse ecological impact on the habitat of a number of bird species, and adverse impact on ground stability and hydrology arising from the management of peat. That refusal was appealed to An Bord Pleanála (Case Reference ABP-312728-22), and the Board likewise refused permission in May 2024, citing the ecological sensitivity of the site and its significant ornithological value, including for the Hen Harrier and Golden Plover, and the presence of the Marsh Fritillary butterfly, an Annex II species. The Board found that, in the absence of monitoring data on the actual impacts of existing wind farm development in the area — including the Slieve Callan West Wind Farm — it could not be satisfied that the cumulative environmental assessment of the likely effects of the proposed development on avifauna could reasonably exclude the possibility of significant impact. We respectfully submit that the current application, prepared by the same consultants on behalf of the same applicant, suffers from precisely the same deficiency: it continues to rely on assumptions regarding the cumulative effects of existing wind farm development in this locality without the benefit of any actual monitoring data demonstrating what those effects have been. Given that this very deficiency formed part of the basis for the Board's refusal of the applicant's earlier proposal for this site, we submit that it must again weigh decisively against the grant of permission for the current application.

Our family relocated back to our ancestral home many years ago, attracted by the serenity and rugged natural beauty of this area. We built our family home here believing it would remain a peaceful rural environment. Everything changed following the construction and operation of the Slieve Callan West Wind Farm in 2018. Since then, our lives have been significantly affected by persistent turbine noise, loss of residential amenity and the industrialisation of the landscape.

Since the Slieve Callan West Wind Farm became operational, our family has experienced ongoing disturbance which we attribute to the operation of the turbines. The persistent turbine noise, including low-frequency and tonal characteristics, has affected our ability to enjoy our home and has resulted in repeated sleep disturbance, stress and a significant deterioration in our quality of life. These impacts have persisted despite our repeated complaints to the relevant authorities. We are extremely concerned that the addition of the proposed Slieveacurry Wind Farm would further exacerbate these impacts and make normal occupation of our home increasingly difficult.

Since the Slieve Callan West Wind Farm became operational, we have experienced severe and persistent interference with our television and radio reception. This interference is not occasional or minor — it has caused regular and prolonged disruption to our ability to receive broadcast services in our home. We are satisfied, based on our experience and observations, that the operation of the turbines, including blade movement, electromagnetic effects and associated low-frequency emissions, is a direct and material cause of this interference. This represents a serious and ongoing loss of residential amenity which has continued for several years without resolution, and which would be further compounded by the addition of the proposed Slieveacurry Wind Farm.

We have also personally observed a dramatic and deeply concerning decline in wildlife in our locality since the Slieve Callan West Wind Farm became operational. Prior to the construction and operation of the wind farm, our area supported a rich and varied wildlife community. Since the wind farm became operational, we have observed the complete disappearance of hen harriers and other birds of prey from our locality. The hen harrier is a protected species under the EU Birds Directive and the Wildlife Acts 1976-2012. Its presence in this area was identified and relied upon in the planning process for the Slieve Callan West Wind Farm. In this regard, we draw An Coimisiún Pleanála's attention to An Bord Pleanála's decision in Case Reference PL 03.237524, which related to the Slieve Callan West Wind Farm. The Inspector in that case recommended refusal of planning permission on two specific grounds: visual impact and the protection of the hen harrier and its habitat. While the Board ultimately granted permission, it did so only after requiring the omission of two turbines specifically to protect residential amenity, and imposing a condition requiring a detailed Conservation and Habitat Management Plan with particular reference to the hen harrier, to be implemented and monitored for the lifetime of the wind farm. The fact that, notwithstanding these conditions and the Conservation and Habitat Management Plan, the hen harrier has since completely disappeared from our locality is deeply alarming. It demonstrates that the mitigation measures imposed were wholly inadequate to protect this species and raises the most serious questions about the weight that can be placed on any ecological surveys or mitigation proposals submitted in support of the current Slieveacurry application. We have similarly observed the complete disappearance of bats from our

locality, species which are also afforded legal protection under Irish and European law. These are not abstract concerns — they reflect the direct, lived experience of our family over many years of close familiarity with this landscape, and we submit that they constitute compelling evidence of the devastating ecological impact that wind farm development has already had on this area.

Despite numerous complaints submitted over several years to Clare County Council's Planning Department, Clare County Council's Environment Department, and the Environmental Protection Agency, our concerns remain unresolved. These complaints relate to ongoing excessive noise, environmental impacts and the apparent failure to adequately enforce planning conditions at the existing wind farm.

We have commissioned an independent expert review of the Noise Compliance Report for the Slieve Callan West Wind Farm, prepared by Dick Bowdler, Acoustic Consultant (Ref: W555, 26th April 2021). Mr Bowdler is a Fellow of the Institute of Acoustics since 1977, a Chartered Engineer, a Chartered Physicist, and one of the foremost wind farm noise experts in Europe, with over fifty years of experience, co-editor of the definitive text "Wind Turbine Noise" and organiser of the International Wind Farm Noise Conferences. A copy of Mr Bowdler's report is enclosed with this submission. His findings are deeply troubling and we respectfully submit that they are directly material to the determination of the current application.

Condition 13 of the planning permission granted for the Slieve Callan West Wind Farm (Case Reference PL 03.237524) provides as follows:

> *"During the operational period, noise levels resulting from the operation of the wind turbines, when measured at the nearest inhabited house, shall not exceed 43dBA (15 minutes Leq). All sound measurement shall be carried out in accordance with ISO Recommendation R 1996 'Assessment of Noise with respect of Community Response' as amended by ISO Recommendations R 1996 1."*

Mr Bowdler's review identifies that the Noise Compliance Report for Slieve Callan West, prepared by AWN Consulting, contains fundamental methodological errors. Most significantly, AWN substituted the measurement methodology specified in Planning Condition 13 — namely ISO 1996-1 — with ETSU-R-97 and the Institute of Acoustics Good Practice Guide, neither of which was required or permitted by the condition. Mr Bowdler concludes that a compliance tester "is not at liberty to change the methodology in the planning condition" and that AWN's substitution of an alternative methodology was not justified. This is not a technical footnote — it means that the entire basis on which AWN purported to demonstrate compliance with the planning condition is fundamentally flawed.

Even more significantly, Mr Bowdler identifies that AWN's own data demonstrates a breach of Planning Condition 13. AWN's Table 4 records turbine noise of 43.9dBA at a wind speed of 10m/s, directly exceeding the permitted limit of 43dBA specified in the condition. AWN sought to explain away this exceedance by attributing the elevated levels to background wind noise, but Mr Bowdler demonstrates that this explanation is incorrect — the figure of 43.9dBA represented turbine noise only, after background noise had already been deducted. The permitted noise limit is therefore being exceeded on AWN's own figures, before any of Mr Bowdler's criticisms of AWN's methodology are even taken into account.

Mr Bowdler further identifies that compliance was not established at wind speeds of 11 and 12m/s, that AWN recorded measurements at the wrong house location — purporting to measure at H22, the nearest inhabited house, while the coordinates given were actually those for H25 — and that the turbine running modes during testing were entirely unknown.

This last point is of the gravest concern. Mr Bowdler's own modelling of the turbines operating in full normal commercial mode produces a calculated maximum noise level of 45.8dBA at the measurement location — almost 3dB above the permitted limit of 43dBA. However, Mr Bowdler notes that the measured noise levels recorded during AWN's compliance testing were approximately 5dB less than the calculated levels at wind speeds of 6, 7 and 8m/s — a discrepancy significantly larger than would normally be expected. Mr Bowdler expressly identifies this as raising the strong possibility that the turbines were being operated in a deliberately reduced noise mode during the compliance testing, and not in their normal full commercial operating mode. He explicitly states that 45.8dBA "may not be the level they are actually operating at" under normal conditions. The implication is stark: the noise levels experienced by residents during normal commercial operation of the wind farm may be substantially higher even than the 45.8dBA calculated by Mr Bowdler, and may have been deliberately concealed by the choice of turbine operating mode during the compliance test. If that is correct, the breach of Planning Condition 13 is not marginal — it is systemic and ongoing, and has been so since the wind farm entered commercial operation.

Mr Bowdler concludes that the Compliance Report does not properly interpret Planning Condition 13, that the noise limit is exceeded at 10m/s on AWN's own figures, and that compliance has not been established at higher wind speeds. Notwithstanding these findings, Clare County Council wrote to MKO on 22nd July 2020 confirming that the wind farm met the conditions of the planning permission. We submit that this determination was made on the basis of a fundamentally deficient compliance report and cannot stand as a reliable assessment of compliance. The planning condition imposed by An Bord Pleanála has accordingly been breached since the wind farm entered operation, and that breach remains unresolved. We submit that this history of non-compliance, combined with Clare County Council's failure to enforce the conditions of the existing planning permission, is a matter

of the gravest concern and must weigh heavily against the grant of any further wind energy development in this locality.

Of particular concern is the identity and track record of the consultancies involved in noise assessment across both wind farm applications. The Environmental Impact Assessment Report for the Slieve Callan West Wind Farm, including the noise impact assessment, was prepared by McCarthy Keville O'Sullivan, trading as MKO. Following the commencement of operations at Slieve Callan West, AWN Consulting were commissioned by MKO Ireland to carry out noise monitoring and compliance reporting for that wind farm — the same compliance report which Mr Bowdler has now demonstrated to be fundamentally deficient. AWN Consulting have now prepared the Noise Impact Assessment submitted in support of the current Slieveacurry application, while MKO are again acting as planning consultants for this application. We submit that this concentration of the same firms across both applications, combined with the serious and documented deficiencies in AWN's compliance work at Slieve Callan West, gives rise to a significant conflict of interest and renders it entirely inappropriate for An Coimisiún Pleanála to place any reliance on the Noise Impact Assessment submitted with this application without first commissioning fully independent scrutiny by consultants with no prior connection to either project.

We further draw the Board's attention to fundamental deficiencies in the background noise survey methodology underpinning the Noise Impact Assessment submitted with the current application. Of the five background noise monitoring locations relied upon in Section 12.4.2 of the Noise and Vibration chapter to derive the wind turbine noise criteria for this application, only one — Location C, described as "adjacent to the dwelling at H058" — was actually sited at the dwelling it purports to represent. Location B was sited at H045, expressly described in the chapter as a "derelict dwelling," and cannot be regarded as representative of the noise environment experienced by a resident. Locations D and E are explicitly labelled in the chapter's own Table 12-6 as "H061 Proxy" and "H006 Proxy" respectively, with the accompanying text confirming that the meters were positioned in fields "opposite" and "to the rear (south) of" those dwellings, not at the dwellings themselves. Location A was positioned only "beside" H001, with no distance stated. These five background noise curves are nonetheless extrapolated, by professional judgement alone, to set the operative noise criteria for in excess of 190 further noise sensitive locations listed in the chapter, none of which were independently surveyed. Given that only one of the five source measurement locations can genuinely be said to represent the dwelling it is assigned to, we submit that the background noise survey methodology underpinning the entire noise criteria framework for this application is not fit for purpose, and that the resulting noise limits cannot be relied upon to protect residential amenity at the great majority of noise sensitive locations in the study area.

The cumulative impact of constructing an additional wind farm directly in front of our home is simply unacceptable. We are already experiencing excessive turbine noise in breach of the applicable planning condition, and we have genuine concerns that our home will become effectively uninhabitable should this development proceed.

The proposed development would also have an unacceptable cumulative visual impact. Our home would be surrounded by additional turbines of up to 175 metres in height, fundamentally altering the landscape and destroying the tranquillity that originally attracted us to live here. It is noteworthy that the Inspector in An Bord Pleanála Case Reference PL 03.237524 specifically identified visual impact as a ground for recommending refusal of the Slieve Callan West Wind Farm. The addition of a further wind farm in this already heavily impacted landscape would compound what the Inspector himself recognised as an unacceptable visual impact, and we respectfully ask An Coimisiún Pleanála to reach the same conclusion in respect of the current application.

The proposal also raises significant environmental concerns. Previous decisions have identified serious risks associated with peat stability, hydrology and impacts on watercourses. These concerns remain. Local domestic water supplies, biodiversity, protected habitats and species would all be placed at unacceptable risk. We do not believe the mitigation measures proposed adequately address these issues, particularly given the demonstrated failure of mitigation measures imposed in connection with the existing Slieve Callan West Wind Farm to protect protected species in this locality.

We respectfully request that the enclosed supporting documentation, including Mr Bowdler's independent acoustic review, independent noise monitoring results and the history of complaints made to Clare County Council and the Environmental Protection Agency, be considered when determining this application.

For all of these reasons, we respectfully request that An Coimisiún Pleanála refuses planning permission for the proposed Slieveacurry Wind Farm.

Yours faithfully,

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SLIEVE CALLAN WIND FARM

REVIEW OF THE NOISE COMPLIANCE REPORT 26TH

APRIL 2021

BRIAN O'HALLORAN.

PREPARED BY Dick Bowdler. REF: W555

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1 INTRODUCTION

1.1 Following complaints of noise from the Slieve Callan Wind Farm, AWN Consulting (AWN) carried out a compliance report for MKO. I assume this report was requested by Clare County Council (CCC) but I have not seen documentation regarding the request for the report.

1.2 This report is my review of that compliance report and presents my opinion as to whether the procedures carried out to inform the report are in accordance with good practice and so whether the results obtained are correct.

1.3 I give my opinion as a noise consultant with experience in environmental noise and in noise within the planning system in the UK and Ireland over 50 years. My qualifications and experience` are set out in an appendix.

2 BACKGROUND

2.1 The wind farm known as Slieve Callan was submitted for planning approval to Clare County Council (CCC) in 2010. CCC granted permission on 19th August 2010 subject to conditions including Condition 19 that dealt with noise.

2.2 CCC's decision was appealed to An Bord Pleanala (ABP) by a number of parties. The Inspector reported in March 2011 and ABP confirmed the grant of Permission with a different set of Conditions including Condition 13 on noise which, though having similarities, was not the same as the original council condition.

2.3 At some point CCC asked the wind farm operator to produce a compliance report to establish whether the noise from the wind farm met the planning condition though I have not seen the text of any request or order. This compliance report was carried out by AWN and dated 6th September 2019 (Compliance Report).

2.4 Resonate, an acoustic consultancy, appear to have been commissioned by CCC to review the AWN report which they did in a letter of 16th November

2019 (RR). AWN responded with further information on 27th January 2020 (AWN Supplementary).

2.5 Amplitude Acoustics (which I believe to be the same or the successor business to Resonate) replied on 11th February 2020 (AA Letter). On 22nd July 2020 CCC wrote to MKO confirming that the wind farm met the conditions of the grant of planning permission.

2.6 The turbine locations are set out in Table 3.1 of the ES except that turbines 3 and 31 were excluded as Condition 3 of the ABP Decision. House locations are set out in Table 8.10 of the ES.

3 ESSENTIAL ACOUSTIC POINTS

3.1 It is necessary to understand a few basic acoustic points to understand the documents and my report. Sound is measured in decibels (dB). This is a logarithmic measure of the sound energy. A halving of sound energy results in a reduction of 3dB and a doubling of energy an increase of 3dB. This is because ten times the logarithm of two (halving or doubling) is 3dB.

3.2 Sound varies in frequency and the sensitivity of the human ear varies with frequency as well. To allow for this we use "A-weighting". The A-weighting is an internationally standardised measure of the total sound, approximating to loudness, and is measured directly with a sound level meter. All the measurements referred to here are A-weighted.

3.3 Sound varies also with time and so there are many measures by which to describe a sound and they can all give different results. For example minimum, maximum and average levels will normally all be different. There are two measures used to describe sound for the purpose of assessing environmental noise. They are the "equivalent continuous sound level" (LAeq) and the "level exceeded for 90% of the time" (LA90). The LAeq is a sort of average (though it is a logarithmic average). The LA90 is a measurement close to the minimum.

4 THE NOISE CONDITION

4.1 Condition 13 in the planning permission says:

During the operational period, noise levels resulting from the operation of the wind turbines, when measured at the nearest inhabited house, shall not exceed 43dBA (15 minutes Leq). All sound measurement shall be carried out in accordance with ISO Recommendation R 1996 "Assessment of Noise with respect of Community Response" as amended by ISO Recommendations R 1996 1.

4.2 Like many planning conditions, this needs some interpretation. In 3.1 of the Compliance Report AWN sets out its interpretation of the condition. This relies heavily on the best practice advice in "The Assessment and Rating of Noise from Wind Farms" (ETSU-R-97) and the Institute of Acoustics "A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise" (IOAGPG). These are both used in wind farm assessments in the UK and are widely used in Ireland. The particular points where these documents are relied upon are:

- It is best practice to measure over a 10-minute time interval rather than a 15-minute one.
- It is best practice to measure wind turbine noise as LA90. ETSU-R-97 says that LAeq for turbine noise is 2dB more than LA90, so the measurements should be carried out as LA90 and then 2dB should be added. The reason for this is that measurement of LA90 is more likely to yield a result because the measurements will not be affected so much by intermittent noise from other sources.

4.3 The interpretation of planning conditions in general has been the subject of scrutiny by the courts and the Supreme Court decision in Kenny v Dublin City Council sets out the position from Paragraph 24 onwards. The position is set out in some detail over several paragraphs but I will quote just two sentences from paragraph 25:

Consequently, the planning permission is to be interpreted according to objective criteria. The subjective beliefs either of the applicant or the planning authority are not relevant or admissible as aids to interpretation.

4.4 In my opinion, and with reference to the judgement in Kenny, the interpretation used by AWN – effectively to replace ISO 1996 in the condition with ETSU-R-97 and IOAGPG is not justified. It is true that the last sentence of condition 13 is not accurate and loosely written, but its meaning is clear. ISO Recommendation R1996 was issued in 1971; the full standard ISO 1996-1 was issued in 1982 and replaced in 2003. The full standard was not an amendment to the Recommendation, as condition 13 suggests, but replaced it. Nevertheless it seems a clear interpretation of the condition that "All sound measurements shall be carried out in accordance with ISO 1996-1".

4.5 ISO1996 is not a standard to be discarded lightly in this case. It is the main standard in Europe for, as its title says, the "Description, measurement and assessment of environmental noise". In 8.3.3.1.1 of the ES, it says that it was used in the noise monitoring carried out for the original Noise Impact Assessment. A condition specifying ISO 1996 was set originally by CCC in their original consent for this wind farm. At the appeal, no objection was raised to the condition. ABP have routinely used ISO 1996 in wind farm noise conditions and the condition applied in this case was, as far as I can tell, universally used for wind farms around the time of this one, although it is the case that there was no consistency between whether L90 or Leq was used in the limits themselves. For example, 02.236608 in 2010 and 13.238964 in 2011. ISO 1996 is also still specified by ABP, for example 306924-20 in 2021.

4.6 I could see that, if the alternative methodology proposed by AWN could achieve the same result as ISO 1996-1 but more reliably, say, then there might be an argument for using it. I do not believe that is the case here and AWN did not produce an argument to that effect or indeed any argument for not using ISO 1996-1. For the purposes of clarification I do not consider the use of 10 minutes rather than 15 minutes to be significant.

4.7 The reason for the use of LA90 is set out in ETSU-R-97 and quoted in 3.2.1 of the Compliance Report: "*The use of the LA90, 10min descriptor for wind farm noise allows reliable measurements to be made without corruption from relatively loud, transitory noise events from other sources*". I agree that this is correct, but the noise limits then have to be set as LA90. The compliance report goes on to say that "*It was proposed to use the measured LA90*

parameter to determine the operational turbine noise levels for this assessment. ln order to derive an LAeq level for assessment of compliance 2dB will be added to the measured LA90, this approach is in line with best practice guidance contained in the IOA GPG". This last phrase is not correct. IOAGPG is predicated on all the measurements and the planning condition being defined as LA90. The LA90 limits set out in ETSU-R97 are certainly derived by subtracting 2dB from limits set elsewhere in LAeq but in ETSU-R-97 and in IOAGPG **measurements** are made in LA90 and the **limits** are in LA90. No measurement as LAeq is part of the procedure. In this case the condition states that measurements are made as LAeq (through the specification of ISO 1996) and the noise limit is in Leq. What AWN have done here is to measure as LA90 and compare that to a limit in LAeq using an arbitrary difference of 2dB. If we knew that in any set of measurements of wind turbine noise the difference between LAeq and LA90 was always 2dB, that argument would be acceptable. But there is no reason why, in the field, the difference would be 2dB for various reasons.

- Sometimes complaints are related not only to the level of noise but to amplitude modulation – the noise level rising and falling with the rotation of the blades. If that is the case, the difference between LAeq and LA90 might quite likely be more than 2dB.
- Turbine noise can vary as the wind speed or wind direction vary over a 10- or 15-minute period and again this might mean the difference was greater than 2dB.
- Turbines might be operating in different noise modes in different wind conditions or at different times of day.

4.8 The most significant reason that ETSU-R-97 and IOAGPG do not deliver the same result at ISO 1996-1 is that ISO 1996-1 not only requires the measured sound pressure level to be taken into account but also takes account of characteristics of the noise such as impulsivity and tones.

4.9 I can also see that, if it is not possible to carry out the measurements as set out in the planning condition then it may be necessary to adopt another procedure. There are undoubtedly potential challenges in making the measurements in LAeq rather than LA90. I think AWN are correct in that members of the acoustic community generally in Ireland as well as in the UK

(where ETSU-R-97 and IOAGPG originate) consider that best practice is to measure wind farm noise as LA90 and to set wind farm noise limits as LA90. This is also the case in Australia and New Zealand but is not generally so in most of Europe or in North America. It is my view that a person testing compliance is not at liberty to change the methodology in the planning condition.

4.10 It is quite likely that measuring as LAeq would mean that accurate noise measurements could not be made at a greater number of wind speeds. However, this is not uncommon in environmental noise measurements and there are ways to get over the problem – for example by carrying out parallel measurements at a location closer to the turbines or simultaneously carrying out sound power level measurements of the nearest turbines.

5 THE MEASUREMENTS AND ANALYSIS IN THE COMPLIANCE REPORT

5.1 This section of my report looks at the findings of the Compliance Report on the basis that the methodology used in the report was acceptable notwithstanding my criticisms in section 4 above.

5.2 In section 4 of the compliance report it says that measurements were made at H22, the nearest inhabited house. In fact H22 is not the nearest inhabited house. This seems to be a typographical error repeated throughout the report, since Table 1 which purports to give the co-ordinates of H22, actually gives those for H25. It is important that the location of the measurements is clearly demonstrated with evidence. There are photographs in Fig 2 of the Compliance Report which should show clearly where measurements were made. I have not had the opportunity of visiting the site so I cannot identify it. The rest of this section assumes that the location is H25.

5.3 The choice of equipment for the measurement of sound and wind and its deployment appears to conform with good practice except possibly the windshield. It is not known whether this is compliant because it is not described and the copies of the photographs that I have are inadequate to identify it though I am aware that AWN normally use enhanced windshields.

5.4 In 5.1.2 of the compliance report it states that measurements were analysed when the measurement location was downwind of the primary turbines. I agree that downwind levels are often considered to be the worst case. However, in the case here the nearest turbine is less than 500m and the difference between upwind and downwind levels may not be great or there may be no difference at all. This is shown in Fig 6 of IOAGPG and seems to be borne out by the analysis in the AWN Supplementary. This point was raised in RR and responded to in AWN Supplementary.

5.5 Using the argument that turbine noise does not rise further above a wind speed of 8m/s, the Compliance Report concludes, at Table 8, that the wind farm is compliant with the condition. Resonate pointed out that this did not comply with good practice and that background noise measurements were required if the total noise (background plus turbine noise) exceeded the noise limit – which it did here above 8 or 9m/s. I agree with Resonate regarding this.

5.6 In response, AWN, in the AWN Supplementary, produced background noise measurements that had been carried out during turbine shut down. Table 1 of the AWN Supplementary lists the background noise levels measured at 8, 9 and 10m/s. Table 2 shows the measured total noise level taken from Table 4 of the Compliance Report. The figures in Table 1 are then deducted (logarithmically) from those in Table 2 to produce the figures in Table 3 all in accordance with good practice, though this is only done for wind speeds of 8, 9 and 10m/s as these are the only ones available. Table 4 then shows the turbine noise LAeq or the total noise, compared with the noise limit.

5.7 If we look at the results in Table 4, the turbine noise level at 10m/s is 43.9dB. On page 5 of the AWN Supplementary it says "*Review of the graphed data above clearly shows an increase in the total measured noise level with increased wind speed starting at 9m/s. Bearing in mind that the turbine manufacturers data states that the turbine noise emissions should reach a maximum at 8m/s, the elevated measured noise levels at 10m/s and above are undoubtedly effected by the background noise sources most likely due to wind generated noise*". But that cannot be the case because the level of 43.9dB is for the turbine noise only, the background noise has been deducted from it. We can see from Table 1 that the background noise due to the wind

generated noise is 33.2dB, 10dB less (although measured as L90 not L90+2).

5.8 At 11 and 12 m/s wind speed it is suggested again that this is background noise. But, if we look at Figure 1 of the AWN Supplementary it looks unlikely that the background noise rises above 40dB at 12 m/s if the trend is extrapolated. However, the fact is that there are insufficient background noise measurements to be certain.

5.9 Although the sound power level of turbines generally levels off at around 8m/s, that depends on how the turbines are operated. It could be that turbines are operating in noise-optimised mode in certain conditions to meet specific noise targets. If, for example, the turbines were run in a noise optimised mode at wind speeds up to 8m/s and then in a higher noise mode after that, then the maximum noise level would not be at 8m/s it could continue rising with wind speed until it ran in full mode. We do not know what mode the turbines were running in during the tests nor what they are normally run in.

5.10 I have modelled the turbine noise using good practice set out in IOAGPG and the Nordex N90/2500HS run in full noise mode and note that the measured wind turbine noise levels in Table 3 of the AWN Supplementary are significantly less than the calculated levels – by about 5dB at 6, 7 ad 8m/s. This is a larger margin that would be expected and suggests the possibility that turbines are being run in reduced mode in some situations. The calculated maximum noise level at H25 in full mode is 45.8dB measured as LAeq. But it is important to note that may not be the level they are actually operating at.

6 CONCLUSIONS

6.1 I do not consider that the Compliance Report properly interprets planning condition 13. However, this would ultimately be a matter for the courts or at least for a legal opinion.

6.2 If the interpretation used in the Compliance report is correct, then its conclusions are that the noise limit in condition 13 is not exceeded at wind

speeds up to 9m/s, the limit is exceeded at 10m/s and compliance has not been established on way or the other at 11 and 12 m/s.

6.3 Further clarification is required to conclude the compliance testing regarding:

- The measurement location;
- The windshield used;
- Turbine running modes during the tests and under normal conditions;
- Further measurements of background noise levels

APPENDIX– QUALIFICATIONS AND EXPERIENCE

I have been a noise consultant for fifty years. I was one of the original members of the Institute of Acoustics (IOA), our professional body, when it was founded in 1974 and I have been a Fellow since 1977. I am also a Chartered Engineer, a Chartered Physicist, a Fellow of the Chartered Institution of Building Services Engineers and a Member of the Chartered Institute of Arbitrators.

I am keen to promote good acoustic consultancy and to ensure that our profession uses best practice. As part of this I encourage debate and am active in organising conferences and meetings. I am the organiser of the biennial International Wind Farm Noise Conferences run by Institute of Noise Control Engineering, Europe, the next one of which is to be held remotely in May 2021. I am co-editor of a book entitled "Wind Turbine Noise" which was published in 2011. In January 2009 I instigated the "Prediction and Assessment of Wind Turbine Noise" (PAWTN) – frequently known as the IOA Bulletin Article. This dealt with some issues of good practice which are either missing from ETSU-R-97 or are ambiguous. It has largely been incorporated into the "IOA Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise" (IOAGPG).

Over my consultancy career I have carried out or reviewed over 500 noise assessments of various types. About 90% of these were on behalf of developers. I have given evidence at many public inquiries on non-wind farm development. I have reviewed over 400 wind farm applications and I have given evidence at nearly 40 wind farm inquiries. I have advised government on wind turbine noise and jointly project managed the large research programme on amplitude modulation for RenewableUK – the wind industry's trade association. I have made presentations to British and European wind industry trade associations and to objectors' conferences. I frequently speak at meetings of Environmental Health officers about wind turbine noise.