

E-mail Message

From: [Name A]
To: [Name B], [Name C]
CC:
Sent: 03/05/2006 at 20:30
Received: 03/05/2006 at 20:30
Subject: FW: Low Frequency Noise Report

Attachments: low frequency noise report draft v3.1.doc

[Name B], [Name C]

My system went funny, so not sure if you got my last e mail. I have agreed that Malcolm should have this peer reviewed, and if we also check it we can get all comments back to Malcolm in one hit.

I'm not in tomorrow and haven't read it yet, but perhaps we could discuss on Friday - I'll ring you both.

[Name A]

-----Original Message-----

From: Malcolm Hayes [mailto:Malcolm@hayesmckenzie.co.uk]
Sent: 03 May 2006 16:27
To: [Name A]
Subject: Low Frequency Noise Report

Dear [Name A],

Attached is the "final" draft.

It needs formatting with chapter numbers but I think it is pretty much there now. I've gone through it a couple of times but I am sure if anyone else reads it they will find typos etc. One always misses then until someone else reads through the report.

I want to send this copy to Geoff Leventhall so it can go through a peer review process and also to make sure I haven't said anything dumb.....If you have any problems with me doing this then please let me know. I will not send it until I have heard back from you.

The appendices have been revised and I'll get those sent through again. Sorry for any impending the confusion on that.

Best wishes

Malcolm D Hayes
Hayes McKenzie Partnership Ltd.
Lodge Park
Tre'r-ddol
Machynlleth
POWYS
SY20 8PL
Tel: +44 (0)1654 781400
NEW FAX NUMBER +44 (0)1654 703315
Web: www.hayesmckenzie.co.uk

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Thank you for your cooperation.

----- Original Message -----

From: [Name A]
To: "Malcolm Hayes"
Sent: Tuesday, May 02, 2006 4:21 PM
Subject: RE: LFN Report Appendix 7 & 8

> Great, Thanks,

>

> [Name A]

>

> -----Original Message-----

> From: Malcolm Hayes [mailto:Malcolm@hayesmckenzie.co.uk]
> Sent: 02 May 2006 14:21
> To: [Name A]
> Subject: Re: LFN Report Appendix 7 & 8

>

>

> [Name A],

>

> I've been going through the draft and it is unlikely to be today but
> tomorrow is definite.

>

> I have just found an error in the Appendices which were sent through last
> week, a label issue not a results issue and I am having these edited
> again.

>

> I'll send through the report this evening if I have finalised the draft.

> IT

> is a question of emphasis as I know the wording will be looked at very
> carefully by anyone and everyone.

>

> Best wishes

>

> Malcolm D Hayes
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> Thank you for your cooperation.

>

>

> ----- Original Message -----

> From: [Name A]
> To: "Malcolm Hayes" ; [Name C]

>

> Cc: [Name D]
> Sent: Tuesday, May 02, 2006 8:41 AM
> Subject: RE: LFN Report Appendix 7 & 8

>

>

>> Thanks Malcolm,

>>

>> Will we get the Exec summary and conclusions today?

>>

>> Kind regards,

>>
>> [Name A]
>>
>> -----Original Message-----
>> From: Malcolm Hayes [mailto:Malcolm@hayesmckenzie.co.uk]
>> Sent: 28 April 2006 15:55
>> To: [Name C]
>> Cc: [Name A]; [Name D]
>> Subject: LFN Report Appendix 7 & 8
>>
>>
>> Appendix 7&8
>>
>> Malcolm D Hayes
>> Hayes McKenzie Partnership Ltd.
>> Lodge Park
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>> Thank you for your cooperation.
>>
>>
>> ----- Original Message -----
>> From: [Name C]
>> To: "Malcolm Hayes"
>> Cc: [Name A] ; [Name D]
>>
>> Sent: Tuesday, April 25, 2006 9:18 AM
>> Subject: Re: URGENT: LFN Report
>>
>>
>>> Malcolm,
>>>
>>> Is the final reporting nearing completion?
>>>
>>> Regards,
>>>
>>> [Name C]
>>>
>>>
>>> Future Energy Solutions
>>> The Gemini Building
>>> Fermi Avenue
>>> Harwell International Business Centre
>>> Didcot
>>> OX11 0QR
>>> United Kingdom
>>> Tel: +44 0870 190 6102
>>> Fax: +44 0870 190 6318
>>> Email: [Name C]@aeat.co.uk
>>>
>>>>> "Malcolm Hayes" 13/04/2006 15:09 >>>
>>> [Name C],
>>>
>>> I have sent an e-mail which attaches the next draft of the LFN report.
>>> I am
>>> unsure whether you will get it as my server has a file size limit and

>>> the
>>> written report is 6Megs before inclusion of any appendicies.
>>>
>>> In the event you do not get it in the next hour or so, do you have an
>>> FTP
>>> site I can upload it to? Otherwise I will look into getting you access
>>> to
>>> ours and I'll upload it there.
>>>
>>> I also append below the text to the e-mail which covered the draft
>>> report.
>>>
>>> Malcolm D Hayes
>>> Hayes Mckenzie Partnership Ltd.
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>>> Machynlleth
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>>>
>>> Thank you for your cooperation.
>>>

--
>>> Gentlemen,
>>>
>>> I attach the next version of the LFN Report. I'm afraid it is still
>>> not
>>> completed, but the results have now been attached.
>>>
>>> There remains the discussion of the results, formatting of the document
>>> to
>>> provide title headings and paragraph numbering, and attachment of the
>>> numerous appendices which detail more of the measured data etc.
>>>
>>> In summary, however, the discussion will indicate the following:
>>>
>>> Modern wind turbines do not produce infrasound emissions that are of
>>> sufficient level to exceed any recognized thresholds of perception,
>>> even
>>> allowing for the most sensitive 5% of the population.
>>>
>>> WHO Guideline indicate that no measurable health effects for noise
>>> which is
>>> not perceived.
>>>
>>> Low frequency noise associated with the operation of wind turbines
>>> meets the
>>> requirements of DEFRA LFN Night-time Criterion in all cases studied
>>> when
>>> measurements performed in accordance with the DEFRA Method, even when
>>> occupants indicated LFN was a problem.
>>>
>>> Internal noise levels exceed BS ISO 226:2003 Acoustics - Normal
>>> equal-loudness-level contours Threshold of Audibility in the region 100
>>> -
>>> 500 Hz, depending upon quality of building materials and whether

>>> windows are
>>> open or closed during measurements.
>>>
>>> DEFRA LFN Study indicated that low frequency noise suffers were no
>>> more
>>> sensitive to low frequency noise with respect to threshold of
>>> perception
>>> than a normal hearing person but that they were less willing to
>>> experience
>>> noise which is above the audible threshold. Therefore, although
>>> internal
>>> noise levels meet DEFRA LFN Night-time Criterion, sufferers may wish for
>>> an
>>> even better internal noise environment and as such, even meeting the
>>> threshold of audibility may not be sufficient.
>>>
>>> However, all locations where wind turbine noise was considered to be
>>> audible
>>> (and a problem) also experience relatively high levels of aerodynamic
>>> modulation which is associated with the wind turbine blades. This noise
>>> is
>>> centred in the 250 - 1000 Hz frequency bands, i.e, outside the range of
>>> LFN.
>>> This high modulation is the cause of the "thump" which is described by
>>> complainants.
>>>
>>> There are a number of theories as to how this is caused. van den Berg
>>> suggests that this is related to tower/blade interactions and stable
>>> atmospheric conditions at night. However, if the cause of this noise
>>> were
>>> tower/blade interactions then one would expect to see this noise appear
>>> at
>>> more wind farm installation in the UK and elsewhere. This does not seem
>>> to
>>> be the case. However, stable atmospheric conditions do result in wind
>>> shear
>>> profiles, both wind speed and wind direction which could result in
>>> aerodynamic conditions which could cause this high modulation. Such an
>>> effect can also be caused by topographical effects of airflow over
>>> hills.
>>>
>>> Stable Atmospheric conditions occur during the night (hours of
>>> darkness) and
>>> this seems to be when modulation is considered to be worst for a
>>> majority of
>>> the dwellings considered within the study. External noise levels
>>> measured at
>>> the ETSU-R-97 locations indicate that wind turbine noise meets the
>>> guideline
>>> values, i.e. 43 dB LA90.
>>>
>>> In the absence of any modulation of the aerodynamic noise, this value
>>> should
>>> offer sufficient protection to ensure that the DEFRA LFN Night-time
>>> Criterion is achieved, but this may mean that wind farm noise is
>>> audible
>>> within a dwelling.
>>>
>>> If modulation is associated with the noise, then a lower level might
>>> be
>>> appropriate.
>>>
>>> If inaudibility is the desire then a still lower level may be
>>> required.
>>> However, this would represent a considerable tightening of the
>>> internal
>>> noise criterion when compared to the DEFRA Night-time LFN Criterion.
>>>

Email for release - 19 Jan 09

>>>
>>>
>>> I shall be working on the above sections and formatting over the
>>> Easter
>>> period.
>>>
>>> Yours faithfully
>>>
>>>
>>> Malcolm D Hayes
>>> Hayes McKenzie Partnership Ltd.
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