Hunterston National Offshore Wind Turbine Test Facility

Summary of noise surveys and complaints to date

July 2017
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1 Introduction

The Hunterston National Offshore Wind Turbine Test Facility (NOWTTF) is located approximately 7km south of Largs in North Ayrshire. Currently there are two wind turbines installed at the site. SSE own and operate a Siemens 6MW wind turbine generator. Mitsubishi hold a sub-lease from SSE to own and operate a 7.2MW wind turbine generator.

Since September 2016 there have been a number of noise complaints pertaining to the site, and specifically relating to the operation of the Mitsubishi wind turbine. This document summarises the complaints received and the response SSE has taken to address the complaints.

SSE is a responsible owner and operator of renewable energy technology, and takes complaints relating to any environmental impact of its operations very seriously. SSE has investigated the complaints raised to date in consultation with North Ayrshire Council (NAC), and NAC advised in April 2017 that there is no ongoing statutory nuisance pertaining to the site.

A total of seven people out of a population of over 19,000 have complained to SSE regarding adverse noise impact or ill health which they claim is caused by the wind turbines. SSE and the NAC Environmental Health (EH) Department have investigated low frequency noise levels and found that there is no correlation between the wind turbine operational status and measured low frequency noise levels; and also that the overall levels of low frequency noise measured would not be expected to cause adverse impact. NHS Ayrshire and Arran have investigated health concerns, concluding that there is no correlation between health issues locally and wind turbine operations. They concluded that there was no available good quality research proving that wind turbines cause ill-health. All noise surveys to date have shown that SSE complies with all noise conditions related to the site, permitted levels have not been exceeded.

1.1. Site overview

SSE attained planning consent for the Hunterston NOWTTF in February 2012. The planning consent was for 5 years from the date of operation of the first wind turbine or 14 October 2017, whichever occurred earlier. A Siemens 6 MW wind turbine was commissioned at the site in March 2014. A Mitsubishi 7.2 MW wind turbine was installed in April 2015. In January 2017 SSE applied to NAC to vary Condition 1 of the planning consent to extend the removal date for the wind turbines to October 2019 in order to facilitate the initially intended 5 year period of operational testing of the wind turbines at the site.

1.2. Planning conditions

In 2014 an application to vary three of the planning conditions pertaining to wind turbine noise for the NOWTTF was approved. The extant planning consent includes 6 conditions pertaining to noise. These are summarised in Table 1 below:

Table 1 – Summary of noise related planning conditions for the Hunterston NOWTTF

<table>
<thead>
<tr>
<th>Condition Number</th>
<th>Condition Summary</th>
<th>Reason for Planning Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Outlines the requirement to measure noise levels in the event of a complaint from the Planning Authority or a complaint from a member of the public that has been confirmed as valid by the Planning Authority.</td>
<td>To meet the requirements of Environmental Health.</td>
</tr>
<tr>
<td>7</td>
<td>Outlines the night time noise immission limits for the cumulative impact of the site, set in accordance with ETSU-R-97.</td>
<td>To meet the requirements of</td>
</tr>
</tbody>
</table>

1 19,000 accounts for the population of Fairlie, Millport, West Kilbride and Largs which are the closest towns to the NOWTTF. The furthest distance between a complaint and the NOWTTF is 8km.
8 Outlines the daytime noise immission limits for the cumulative impact of the site, set in accordance with ETSU-R-97. To meet the requirements of Environmental Health.

9 Outlines the action to be taken in the event of a complaint to SSE. SSE is required to notify the council and make contact with the resident within 72 hours of receipt of a complaint via a publicly available 24-hour contact number. In the event that the Council confirm the complaint is valid Condition 6 will apply. To deal with noise complaints timeously.

10 Outlines the action to be taken in the event of a measured exceedance of the noise limits set out in Condition 7 and 8. The operator is required to engage with the manufacturer(s) of the turbine(s) to identify and implement a method of reducing the noise emissions from the turbine(s) to a sufficient level to ensure immissions are within the limits outlined in Condition 7 and 8. To monitor and minimise noise.

11 Outlines the requirement for noise immissions to be measured at 4 locations in proximity to the site within 4 weeks of commissioning of any wind turbine at the site. To monitor and minimise noise.

As noted above, Condition 11 requires that the cumulative noise levels be measured within 4 weeks of commissioning of each wind turbine. An operational noise survey was undertaken by an independent acoustic consultant in 2014 to assess the noise immissions due to the Siemens wind turbine at the nearest residential receptors to the wind farm and was submitted to and accepted by NAC in 2015. This survey demonstrated compliance with the consented noise immission limits.

An operational noise survey has not yet been completed for the Mitsubishi wind turbine due to the testing and development nature of this wind turbine, as the turbine is not yet fully commissioned for continuous full power operation. NAC has been kept informed of delays to the Operational Noise Survey for the Mitsubishi wind turbine, due to the difficulties in achieving the operational status required to undertake the survey. Further details of ongoing noise surveys for the site are included in Section 6.

It should be noted that Condition 10 requires that, in the event of an exceedance of the noise limits, the operational mode of the turbines is altered to ensure that the cumulative noise immissions from the wind turbines do not exceed the consented noise limits. As such, the planning conditions include both a limit to control the noise immissions as well as a remedy that can be implemented in the event of an exceedance.

## 2 Summary of complaints and investigations to date

In September 2016 SSE received a first complaint regarding low frequency noise from the Mitsubishi wind turbine. It should be noted that the initial complaint specifically referenced the Mitsubishi wind turbine, for which an operational noise survey had not yet commenced due to the status of the turbine in its commissioning phase. Notwithstanding that, as SSE strives to be a responsible developer and operator of renewable generation sites, a low frequency noise survey was arranged to be undertaken by an independent acoustic consultant, Spectrum Acoustics, as soon as possible. Prior to commencement of the low frequency noise survey, the survey methodology and assessment criteria were agreed with NAC Environmental Health Officer (EHO). The measurement location was also agreed in principle with NAC EHO prior to deployment of the measurement equipment on site.

In summary, SSE has received seven complaints relating to low frequency sound or overall sound levels from the Hunterston NOWTTF to date. A timeline of initial notification of each complaint received and response from SSE is summarised in Table 2.
### Table 2 – Summary of complaints received and investigations undertaken to address complaints.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>28 Sept 2016</td>
<td>Complaint received direct to SSE from resident of Main Road, Fairlie regarding low frequency noise from Mitsubishi wind turbine (Complaint 1). This was discussed with the resident to determine the nature of the noise concerns and to confirm that SSE would investigate them.</td>
</tr>
<tr>
<td>29 Sept 2016</td>
<td>SSE contacted an independent acoustic consultant to discuss low frequency noise complaint and discuss the type of survey that might be undertaken.</td>
</tr>
<tr>
<td>04 Oct 2016</td>
<td>SSE received quote from independent acoustic consultant to undertake low frequency noise survey. SSE discussed the proposed survey with resident who had issued the complaint, in order to agree that the measurements could be undertaken internally in her property, and that a noise issue log would be kept for the duration of the survey.</td>
</tr>
<tr>
<td>13 Oct 2016</td>
<td>SSE contacted NAC to discuss the complaint received and the measurements that were proposed to be undertaken. The EHO was on annual leave at the time but a representative from NAC confirmed that a second complaint had been received via NAC from another resident of Main Road, Fairlie regarding low frequency noise from Mitsubishi wind turbine (Complaint 2).</td>
</tr>
<tr>
<td>20 Oct 2016</td>
<td>SSE contacted NAC EHO to advise of complaints received and intended measurement campaign. The proposed methodology was accepted by NAC EHO. NAC EHO confirmed that the preferred measurement location was one of the Main Road residences with the upstairs living room at the other Main Road complainant the second preference location.</td>
</tr>
<tr>
<td>21 Oct 2016</td>
<td>Low frequency noise measurement equipment was installed at 2(^{nd}) preference Main Road, Fairlie. The location at 1(^{st}) preference Main Road, Fairlie was investigated however the resident was not prepared to have the equipment set up in the property.</td>
</tr>
<tr>
<td>30 Nov 2016</td>
<td>Noise measurement equipment removed from site.</td>
</tr>
<tr>
<td>22 Dec 2016</td>
<td>Low frequency noise report issued to NAC for review and acceptance. The survey concluded that measured low frequency noise levels were within the accepted criteria for the survey and were at a level not expected to cause disturbance. The low frequency noise criteria were not defined in the planning consent and as such were agreed with NAC prior to commencement of the survey, in line with the UK acoustics standard for low frequency noise assessment.</td>
</tr>
<tr>
<td>13 Jan 2017</td>
<td>SSE submitted a Section 42 planning application for the amendment of Condition 1.</td>
</tr>
<tr>
<td>13 Jan 2017</td>
<td>Low frequency noise report issued to Hunterston Community Liaison groups and residents.</td>
</tr>
<tr>
<td>25 Jan 2017</td>
<td>Confirmation received from NAC that the Low Frequency Noise report is accepted.</td>
</tr>
<tr>
<td>01 Feb 2017</td>
<td>NAC advised that they were investigating a further complaint from resident at Boathouse Avenue, Largs (Complaint 3). NAC advised that they were investigating the complaint and that no further action was required from SSE at that time. NAC noted that this residential receptor is approximately 8km from the NOWTTF, while the measurement report was based on a survey undertaken at approximately 3km from the NOWTTF.</td>
</tr>
<tr>
<td>10 Feb 2017</td>
<td>Complaint received directly to SSE from resident at Montgomery Avenue, Fairlie (Complaint 4).</td>
</tr>
<tr>
<td>06 Mar 2017</td>
<td>Email complaint received by SSE in carbon copy from a Fairlie resident who</td>
</tr>
</tbody>
</table>

For the majority of the noise measurement survey the Mitsubishi wind turbine was operational intermittently and when the turbine was operational it was during daytime periods only and up to a maximum power output of 4MW. Although the noise survey was initially intended to be undertaken for a period of 2 weeks, the survey period was extended to 6 weeks to ensure that sufficient data was recorded with the turbine operational and under the appropriate wind conditions. Prior to removal of the equipment from site it was possible to attain measurements with the Mitsubishi wind turbine operational at 5.6MW. The operational status of the Siemens wind turbine was not altered during the low frequency noise survey.
contacted the Largs and Millport Weekly News regarding the noise impact of the wind turbines at Hunterston (Complaint 5). A response was sent directly to the resident, to establish further details of the complaint and an address, however the resident did not engage any further with SSE.

07 Mar 2017  NAC measured the low frequency noise levels at residences in proximity to the Hunterston NOWTTF. SSE shut down the Mitsubishi wind turbine at times requested by NAC to allow the difference between measurements with and without the Mitsubishi wind turbine operational to be assessed.

08 Mar 2017  Planning committee hearing during which the Hunterston Section 42 planning application was addressed. The decision was deferred to allow for the undertaking of further background noise testing, to establish any change in background noise levels since the original 2011 survey.

15 Mar 2017  Complaint direct to SSE from resident of Boatthouse Avenue, Largs, who had previously issued a complaint via NAC (as per entry 01 Feb 2017).

17 Mar 2017  NAC advised that complaints had been received from two residents who had previously engaged directly with SSE (Main Road, Fairlie, and Montgomerie Avenue, Fairlie) and an additional complaint from a resident at Main Road, Fairlie (Complaint 6).

12 Jun 2017  Complaint from resident at Millport regarding health impacts from the wind turbines (Complaint 7).

13 Jun 2017  Sound measurement equipment was installed to undertake Background Noise Survey and Operational Noise Survey, as discussed further in Section 6.

14 Jun 2017  Planning committee hearing during which the Hunterston Section 42 planning application was addressed. The decision was deferred to allow for the undertaking of further background noise testing.

01 Jul 2017  Direct complaint from resident of Main Road, Fairlie regarding health impact from the wind turbines. Previous notification of this resident was via NAC and also the planning committee hearing.

The survey procedure used to undertake the low frequency noise survey was agreed with NAC prior to commencement of the survey. The survey was undertaken in accordance with the Department for Environment, Food, and Rural Affairs (DEFRA) NANR45 Procedure, which has been widely adopted by Local Authorities for the purpose of investigating complaint of low frequency noise. This survey measures low frequency noise between 10 Hz and 200 Hz.

During the low frequency noise survey the resident was requested to keep a noise issue log for the duration of the noise survey, to ensure that the analysis focused on the periods of concern. The noise log identified periods when the wind turbine was operating rather than periods that were a specific concern for noise. As such, the analysis focused on all periods during the survey when the Mitsubishi turbine was operational.

During each analysis period the maximum measured noise level within each frequency band was compared with the agreed acceptance criteria. The low frequency noise survey assessed the noise from all sources in the environment and did not isolate the specific noise due to the wind turbines. On a small number of occasions there were exceedances of the acceptance criteria which further analysis of the measured audio data and the turbine power output data identified were due sources other than the wind turbine (e.g. door closing in the house). The report concluded that the measured low frequency noise levels were within the accepted criteria and were at a level not expected to cause disturbance.

It should be noted that all noise surveys commissioned by SSE have been undertaken by independent acoustic consultants, who are full members of IOA and bound by their code of conduct.

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2 The University of Salford ‘Procedure for the assessment of low frequency noise complaints’ Revision 1, December 2011, prepared for DEFRA under contract number NANR45.
3 Complaints received when turbine not operational

There have been complaints received regarding the noise from the Hunterston NOWTTF on a number of specific occasions. Each of these complaints has been investigated to confirm the operational status of the wind turbines during the complaints, and to identify if there were specific site conditions which were leading to these complaints. Specifically on 25 February and 04 April 2017 complaints were received regarding the impact of the Mitsubishi wind turbine when the wind turbine was not operating. On these particular occasions it is of note that the site was not in operation, and there was no equipment relating to the Mitsubishi wind turbine in operation at the site.

During periods when the Mitsubishi wind turbine is not operational the wind turbine blades are feathered to prevent the wind from catching the blades and the wind flows over the blades. In this situation the blades are not locked into position, as this would present a safety hazard for the wind turbine. As such, in these conditions the wind turbine rotor may appear to rotate at a slow speed, however as the blades are pitched to avoid catching the wind there would be minimal aerodynamic noise from the turbine in this circumstance. Following complaints received during periods when the wind turbine was not operational SSE investigated the wind turbine start up procedure with Mitsubishi. Mitsubishi have confirmed that the technology in the wind turbine may require the wind turbine rotor to rotate at operational RPM speeds of up to a maximum of 20 minutes prior to the generation of electricity from the unit. This start up procedure has been considered in the summary of complaints outlined above when the turbine was not operational and it can be confirmed that during the complaint periods of 25 February and 04 April 2017, when the site was not operational and there were no staff on site, the wind turbine blades were not rotating at operational speeds.

Concerns have been raised regarding the low frequency noise survey not considering periods when the blades were turning during the warmup procedure, prior to generation of electricity from the wind turbine. It should be noted that the primary complaints are regarding the operation of the wind turbine, and therefore the removal of data prior to full generation from the wind turbine is considered to be a robust approach to the analysis.

4 Communication with North Ayrshire Council

SSE has maintained contact with NAC EH Department throughout the operational lifetime of the site. SSE advised NAC EHO of the complaints relating to low frequency noise and agreed the assessment methodology and criteria prior to commencement of the study. In addition, SSE has facilitated NAC undertaking measurements with the Mitsubishi wind turbine on and off, in order to allow the specific impact of the Mitsubishi wind turbine on low frequency noise measurements to be identified.

NAC has undertaken measurements of low frequency noise at a number of residential properties from which complaints have been received. NAC advised SSE that its measurements were in agreement with those of Spectrum Acoustics, and that the levels measured were below the DEFRA assessment criteria.

During discussions with NAC on 26 April 2017, NAC confirmed that there is no statutory nuisance due to noise from the Hunterston NOWTTF. SSE suggested that it would repeat a further low frequency noise survey in accordance with the DEFRA procedure, however during discussions with NAC it was decided that this would not provide any additional assurances to residents beyond the surveys already completed and therefore would not be pursued.
5 Response from NHS Ayrshire and Arran to health concerns raised

NHS North Ayrshire and Arran has responded publicly to health concerns relating to the Hunterston NOWTTF with press releases on 11 October 2016, 28 February 2017, 23 May 2017 and 20 June 2017. These responses are shown in Appendix 8.1. A number of assurances which have been issued to the public by NHS Ayrshire and Arran are shown below:

- Local general medical practice data did not show an increase in local residents reporting dizziness after the first turbine became operational. (October 2016, February 2017 and June 2017 press releases)
- We (NHS Ayrshire and Arran) undertook a full review of the scientific research, GP data and a very small number of complaints by residents, and have found no convincing evidence that wind turbines are causing ill-health. This view was also reached separately by Health Protection Scotland (HPS) which also carried out a review of the evidence. (May 2017 press release)
- We (NHS Ayrshire and Arran) concluded that there is no good published scientific evidence that wind turbines, and associated infrasound, cause disease or adverse health effects in humans. (June 2017 press release)
- Research literature suggests that a small proportion of the population may be more sensitive to infrasound, and that this can cause annoyance. However, there is no good evidence that this is a direct cause of ill-health. (June 2017 press release)
- We (NHS Ayrshire and Arran) have issued recommendations that any residents who have significant and ongoing concerns about their health seek medical attention. There are many different causes of dizziness and if symptoms are severe or ongoing, people should seek further medical assessment from their GP. (June 2017 press release)

In addition, in October 2016 a representative from NHS Ayrshire and Arran issued a response to the Chairperson of the Fairlie Community Council, which was also published in a number of public forums, to alleviate public concern regarding health impacts of the wind turbine. This letter is shown in Appendix 8.2. The letter summarises the results of an NHS investigation into local GP records to determine if there has been an increase in complaints to GPs regarding dizziness and/or nausea in the period between 2009 and 2016 (i.e. before and after operation of the wind turbines). This letter states:

- The data, both for Fairlie and for other areas close to the turbines, does not show any increase in number of people reporting symptoms of dizziness to their GP, following the installation of the wind turbines at Hunterston.
- There is no convincing evidence that the reported symptoms of dizziness and/or nausea in the Fairlie Community are caused by the Hunterston wind farm. Although the international literature suggests that wind farms can lead to concerns from the public, these concerns about health impact are not supported by research.

Representatives from NHS Ayrshire and Arran were present at the planning committee hearing of 14 June 2017, and reiterated the results of their investigations into health impacts due to the Hunterston wind turbines. The NHS representatives provided further information in relation to the following (as stated in the Planning Committee Hearing Report):

- Two further independent opinions that were sought (outwith the public health department), including the independent Advisory Group on Non-Ionizing Radiation (AGNIR), who reported that there is no consistent evidence of any psychological or behavioral effects of acute exposure to infrasound in humans;
- Some evidence that a small percentage of the population may be more sensitive to infrasound and exposure can cause annoyance in some of these individuals;
- Analysis of 8 years of general practice data for the local area that did not show increases in the number of people reporting symptoms of dizziness to their GP; and
Correspondence with Fairlie Community Council since October 2016 to reassure residents regarding the lack of a causal link between turbines and ill health, and requesting that people with ongoing ill health see their GP as there may be another underlying cause of their ill health. This assessment of risk to public health was shared with the local press on three occasions during the last year, in response to several press enquiries.

In summary NHS Ayrshire and Arran have confirmed that there is no evidence to support a causal link between the Hunterston NOWTTF and adverse health impacts on the residents of Fairlie.

6 Current status of noise monitoring for Hunterston NOWTTF

SSE is currently undertaking an updated Background Noise Survey for the Hunterston NOWTTF as well as an Operational Noise Survey for the Mitsubishi wind turbine at the site. The Siemens wind turbine is not currently in operation (since March 2017) due to a requirement for a blade repair. As such the ongoing Operational Noise Survey will require to be repeated when this wind turbine is operational to ensure that the cumulative noise immissions from both wind turbines are in compliance with the consented noise limits. As operation of the Mitsubishi wind turbine without curtailment continues to be intermittent, the duration of the current Operational Noise Survey may be prolonged. Unfortunately the nature of a test site is that it will have reduced turbine availability when compared to a commercial wind farm, and the current reduced turbine operation time is unavoidable.

SSE agreed to undertake an updated Background Noise Survey as part of the required Operational Noise Survey in order to address concerns raised that the background noise levels may have changed materially since the 2011 Background Noise Survey. This was agreed in principle prior to the March 2017 planning committee hearing, and SSE agreed a planning condition to formalise that agreement prior to the June 2017 planning committee hearing. The proposed planning condition relating to an updated Background Noise Survey was intended to allow a decision to be taken on the Section 42 application while the measurement of background noise was going, and as such the results of this survey were not required to allow a decision to be made on the Section 42 application.

Fairlie Community Council has appointed a group called the Independent Noise Working Group (INWG) to work on its behalf. SSE and its appointed independent acoustic consultants have made every effort to work with this party, and respond to concerns raised by them. SSE attended a meeting on 26 April 2017 to discuss the proposed methodology for the Operational and Background noise surveys. SSE delayed installation of noise measurement equipment for the ongoing survey to accommodate availability for attendance of the installation by members of the INWG, at the request of NAC. Following this delay the decision on the Section 42 was deferred for a second time during the planning committee meeting on 14th June, as the results of the updated Background Noise Survey had not been provided.

Following completion of either the current ongoing Operational Noise Survey or the cumulative Operational Noise Survey that will be undertaken when both wind turbines are operational if an exceedance of the noise limits is identified curtailment of one of both wind turbines will be implemented to reduce the noise immissions to operate with the consented noise limits, in accordance with the requirements of planning condition 10.

7 Conclusions

A relatively small number of noise complaints have been received and investigated by SSE, North Ayrshire Council’s Environmental Health Department and the NHS. Noise levels are found to be within acceptable limits and no causal link between the turbines and ill-health experienced by some complainants has been identified. Complaints of symptoms have also been received during periods when no turbines were in operation. SSE has taken its responsibilities seriously, has complied with requirements of planning conditions and the NAC.
Environmental Health Department. SSE will continue to carry out monitoring and take any complaint seriously and operations at the site will be curtailed if any exceedance of limits is found.

NHS Ayrshire and Arran have responded publicly on the reported impacts of the NOWTTF on health on a number of occasions. They have stated that there is no causal link between wind turbines and ill-health. They have also investigated GP records and found that there has been no increase in dizziness being reported to GPs since the Hunterston NOWTTF became operational.
8 Appendices
8.1. Appendix 1 – NHS media releases
Dizziness concerns
Statement by Dr Elvira Garcia, Consultant in Public Health Medicine

NHS Ayrshire & Arran’s Public Health department is not aware of an increase in the number of people who have reported feeling dizzy in Fairlie or the surrounding areas.

Current evidence suggests it is unlikely that people are physically affected by low-frequency sound like that emitted by wind turbines.

Ends

Date of release: Tuesday 11 October 2016

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Wind turbine
Statement by Hazel Henderson,
Consultant in Public Health Medicine

NHS Ayrshire & Arran’s Public Health department reported the results of a review into whether the Hunterston wind turbines were likely to be causing ill-health in October 2016. A letter outlining the full findings was sent to the Chair of Fairlie Community Council. The conclusion was that there was no available good quality scientific research proving that wind turbines cause ill-health. Local general medical practice data did not show an increase in local residents reporting dizziness after the first turbine became operational.

In February 2017 we received an enquiry from a Fairlie resident regarding excessive noise from one of the Hunterston wind turbines. Public Health is working with the local authority to review this concern and will respond to the resident in due course.

Ends

Date of release: Tuesday 28 February 2017

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Wind turbines
Statement by Hazel Henderson,
Consultant in Public Health

NHS Ayrshire & Arran’s Public Health department was notified that a small number of Fairlie residents had reported concerns about wind turbines potentially causing ill-health.

We undertook a full review of the scientific research, GP data and a very small number of complaints by residents, and have found no convincing evidence that wind turbines are causing ill-health. This view was also reached separately by Health Protection Scotland (HPS) which also carried out a review of the evidence.

Public Health shared the results of our initial review with the Fairlie Community Council in October 2016 informing them of the findings and asking them to share the conclusions, in order to reassure the local community that there is no good evidence that wind turbines harm health.

We would recommend that any residents who have significant concerns about their health seek medical attention. There are many different causes of dizziness and if symptoms are severe or ongoing, people should seek further medical assessment from their GP.

The information is also available to members of the public who can find it at www.nhsaaa.net and choose Public Health from the Services A-Z tab.

http://www.nhsaaa.net/media/481574/20170523turbinepubdoc.pdf

Ends

Date of release: Tuesday 23 May 2017
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Wind turbines
Statement by Dr Joy Tomlinson
Interim Director of Public Health

NHS Ayrshire & Arran’s Public Health Public Health Department can take appropriate actions whenever there are reasonable grounds to suspect that there is a significant risk to public health.

In response to concerns raised by a very small number of residents, the Public Health department investigated concerns that infrasound generated by wind turbines causes harm to human health.

Following this investigation, we concluded that there is no good published scientific evidence that wind turbines, and associated infrasound, cause disease or adverse health effects in humans. Research literature suggests that a small proportion of the population may be more sensitive to infrasound, and that this can cause annoyance. However, there is no good evidence that this is a direct cause of ill-health.

No additional submission was made to North Ayrshire Council’s planning committee. Information gathered by residents about their health was provided to the planning committee officials by Hazel Henderson, Consultant in Public Health, in advance of the planning meeting as agreed with the Chair of the Community Council. No additional statement was made on behalf of NHS Ayrshire & Arran. All new information has been considered carefully, and in the balance of evidence, the conclusions of the original health risk assessment did not change.

We have issued recommendations that any residents who have significant and ongoing concerns about their health seek medical attention. There are many
different causes of dizziness and if symptoms are severe or ongoing, people should seek further medical assessment from their GP.

We have not altered our position with regard to the interpretation of GP data. The purpose of our analysis of the GP data was to establish whether there had been an increase in the number of residents experiencing symptoms of dizziness, severe enough to warrant GP consultation. Our analysis did not show any increase in dizziness reported to a GP among the local population, coinciding with the operation of the wind turbines.

A summary of our review and subsequent findings is available to members of the public who can find it at www.nhsaaa.net and choose Public Health from the Services A-Z tab.

http://www.nhsaaa.net/media/481574/20170523turbinepubdoc.pdf

Ends

Date of release: Tuesday 20 June 2017

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8.2. Appendix 2 – NHS letter
Dr Armstrong

Your e-mail to the North Ayrshire Council Environmental Health Department has been copied to me, as I have responsibility for population health protection. I have investigated these health concerns further, and I understand Environmental Health are also dealing with an enquiry relating to the matter.

Please find attached a copy of the letter I will be sending to the Chair of the Fairlie Community Council. We have also issued a similar response to the local press in response to the media story, to help allay any public anxiety.

The reported health concerns have never been reported to our department, so I have responded as a result of the story in the press and the concern raised with my council colleagues.

Regards

Hazel

Hazel J Henderson
Consultant in Public Health (Health Protection)

NHS Ayrshire and Arran
Afton House
Ailsa Hospital
Dalmellington Road
Ayr KA6 6AB

Dear Mrs Holmes,

Concerns about wind turbines causing ill health

I am writing in response to concerns raised by the Fairlie Community Council regarding whether complaints of dizziness and nausea could be linked to the wind turbines at Hunterston. Although the Public Health Department has not been contacted directly about these concerns, I have written to you because we have a lead role in protecting our population from environmental hazards. As such I have investigated these concerns further, and write to present my findings. It is important to point out that I have no conflict of interest, and that my role is to provide an objective and scientific assessment of these concerns. In order to assess whether complaints of dizziness and nausea could be linked to the wind turbines at Hunterston, I have conducted the following investigations:

1. Reviewed the highest available quality international scientific research to establish whether wind turbines cause health effects.
2. Analysed (anonymised) local GP data going back 8 years to establish whether these symptoms had increased in the surrounding population since the first wind turbine became operational at Hunterston.

Conclusions from current scientific research

Use of wind turbines and wind farms is now common in many parts of the world, so there is a wealth of research available to allow assessment of whether wind turbines
are known to cause health problems. I have used the highest quality research available, as poor quality research can often lead to the wrong conclusions. I have also used evidence reviews conducted by independent scientific bodies with no conflicts of interest, to avoid obvious problems related to bias and conflict of interest. Using these methods has enabled me to present an independent view based on the best research that was available at the time of writing.

Do wind turbines cause ill health?

The available scientific literature concludes the following:

- There is no peer reviewed scientific data to support a claim that wind turbines are causing disease or adverse health effects in humans.
- There is no evidence for a set of health effects from exposure to wind turbines that could be characterised as a ‘wind turbine syndrome’. The research on which this claim has been made is of very poor quality and does not prove causation.
- Assuming that reported symptoms are solely related to an exogenous source (eg. wind turbines), without evaluating for other known causes of these symptoms, is not consistent with best practice in medicine.

The scientific evidence does not support a causal link between wind turbines and ill health. However, in order to investigate your question as thoroughly as possible, I have analysed general practice data from 2009 to 2016 to ascertain whether there was an increase in reporting of dizziness since the wind turbines began operating. The data, both for Fairlie and for other areas close to the turbines, do not show any increase in the number of people reporting symptoms of dizziness to their GP following the installation of the wind turbines at Hunterston. In fact, the numbers are consistent year-on-year.

To conclude, there is no convincing evidence that the reported symptoms of dizziness and/or nausea in the Fairlie Community are caused by the Hunterston wind farm. Although the international literature suggests that wind farms can lead to concerns from the public, these concerns about health impact are not supported by research. I am sure you agree with me that this important message should be shared by the Fairlie Community with concerned residents, especially given the recent media interest in this story.

I hope that the Fairlie Community Council is reassured by my investigations into their concerns. I would ask that you share this letter with members of your Community Council to help allay any anxieties the public may have about the wind turbines. In the meantime, I would recommend that any residents who have significant concerns about their health seek medical attention. There are many different causes of dizziness and nausea and if symptoms are severe or ongoing, I would advise people to seek help from their GP.

Yours sincerely,

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