

**The proposed use of land as a grass air
strip
at
South Moor Farm
Langdale End
Scarborough
North Yorkshire
YO13 0LW**

Provided by MAS Environmental
14th January 2014

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Reviewed by: Mike Stigwood – Director/Senior Environmental
Health Consultant

1.0 Summary findings and conclusions

- 1.1 MAS Environmental Ltd have undertaken a noise study to investigate the suitability of a grass airstrip for use by light aircraft on land at South Moor Farm, located in the North Yorkshire Moors National Park.
- 1.2 The findings of a background noise survey indicate that the noise climate is typically rural with the soundscape consisting of natural sounds such as bird song and man-made sounds such as cars, farm machinery and vehicles, overflying aircraft and sounds related to recreational activities such as motor sports.
- 1.3 Noise levels of light aircraft taking off from the proposed site are insignificant when limited to the number of movements proposed. The actual duration of an aircraft movement lasts around one to two minutes and once in the air and flying away from the listener, the noise rapidly decreases in volume.
- 1.4 Light aircraft are much less likely to result in an equine related incident compared to low flying military aircraft or other rural sounds such as bird scarers or clay pigeon shooting, however there is a bridleway that runs through the application site. Aircraft engines will be clearly audible when preparing for take off or on approach to land and to give increased warning that flying is taking place, a flag or windsock will be flown, accompanied by signage on the bridleway.
- 1.5 Risks to horses has been considered at other sites assessed by MAS Environmental and even with dressage horses, expert

veterinary advice was that an adjacent light airfield, potentially overflying the dressage training area was acceptable¹.

- 1.6 In view of the limited activity of the proposed development and the avoidance of risks to horse riders the development is considered to fall well within acceptable limits of impact. This also needs to be considered in the light of the fact 28 days a year can be used for flying activity without the need for planning permission and private domestic use is uncontrolled other than in relation to any structures on the ground.

¹ Braceborough airstrip, South Kesteven DC

2.0 Introduction

- 2.1 MAS Environmental Ltd was engaged by the applicant to undertake a noise impact assessment including a background noise survey of a proposed grass air strip on land at South Moor Farm in Dalby Forest, Pickering.
- 2.2 The applicant, the owner of South Moor Farm holds a private pilots license and has a share in ownership of a light aircraft. The applicant seeks to locate the aircraft from its current location at Wombolton airfield to South Moor Farm and store it in a hanger to be constructed as part of this planning application. It is proposed that the hanger be capable of housing up to 10 light aircraft as there is a shortage of hanger space at local airfields.
- 2.3 The applicant describes himself as a "fair weather flyer" and that the air strip will be used primarily for himself and other pilots who may use the hanger space or be visiting the area and staying at the bed and breakfast business the applicant also runs at South Moor Farm. The use therefore of the air strip is expected to be minimal and unlike that of an aerodrome that undertakes pleasure or training flights. This element could be controlled in a number of ways.
- 2.4 The application for development (reference number NYM/2013/0435/FL) was submitted on and refused on a number of grounds. In terms of noise impact, the reasons for refusal by the Local Authority and objections from members of the public can be summarised into four main categories;
- 1) The noise impact upon the tranquillity of the national park.
 - 2) The noise impact upon surrounding dwellings.
 - 3) The impact upon other leisure pursuits in the national park in particular horse riders and the concern that aircraft

taking off or landing may spook a horse leading to an accident.

- 4) The noise impact upon nesting birds in the adjacent North Yorkshire Moors Special Protection Area and Site of Special Scientific Interest (SSSI).

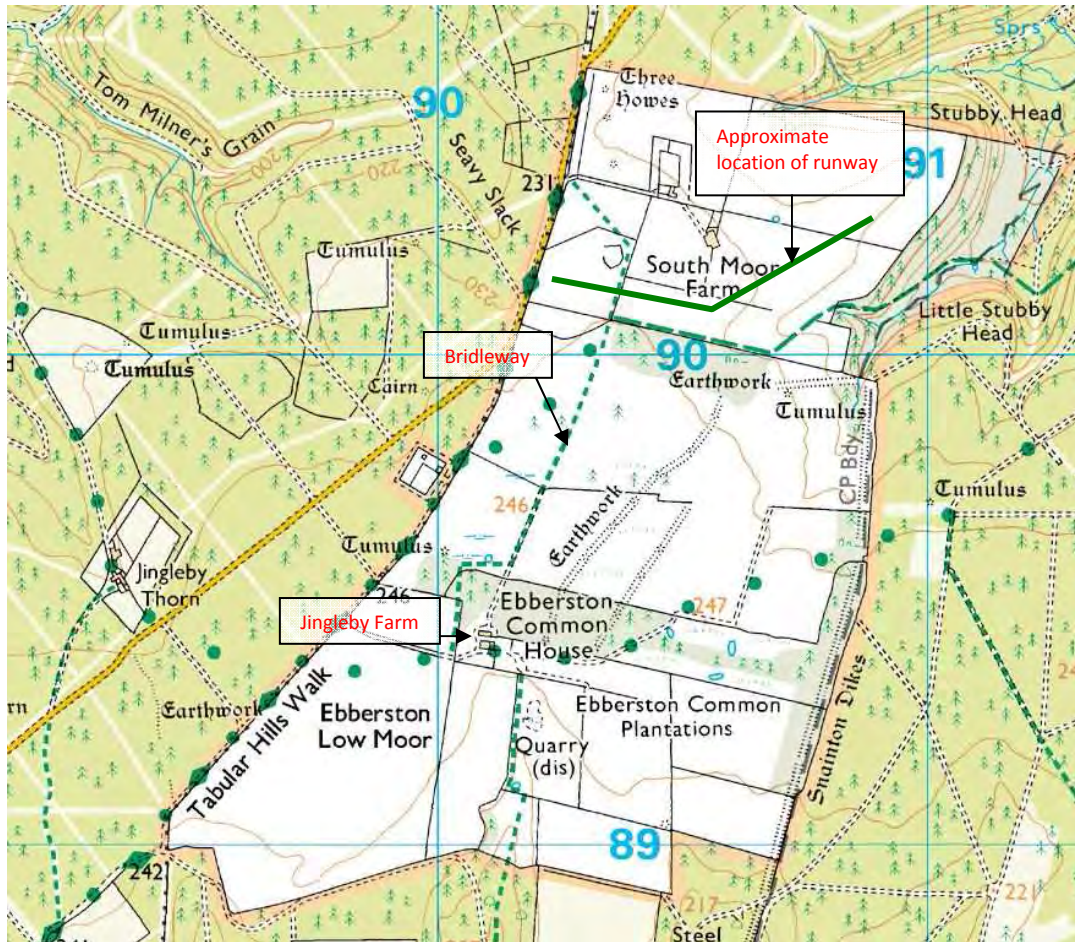
2.5 There is no doubt that light aircraft using the proposed air strip will create noise albeit for a limited duration. The applicant recognised this and in the original planning application outlined measures to limit the noise impact of the development. However, it is understandable that in order for the Local Planning Authority to make an informed decision, the impact must be adequately quantified and discussed.

2.6 The measures put forward by the applicant in the original application to limit the noise impact are as follows;

- a) No night flights therefore aircraft noise will not occur during the core sleep hours
- b) Restricted to small light aircraft as the runway cannot accommodate larger, noisier multi-engine aircraft and helicopters in particular.
- c) Limited to recreational flying- no aerobatics or touch and go manoeuvres- these are seen as the most disturbing and most complained about elements around airfields
- d) Avoiding flying directly over neighbouring properties. This minimises the duration that aircraft engines will be heard by residents.
- e) A maximum number of aircraft movements of 20 per day although the level of activity would be typically lower. It is likely that there will be less activity on days following flying days. A restriction on the total number of moments could also be conditioned, for example no more than 40 movements in a week period.

3.0 Site description

- 3.1 The proposed development site is located in Dalby Forest and is one of many working farms in the National Park. The area is prized for its open space and wildlife and attracts a number different leisure pursuits such as walking, mountain biking, horse riding as well as motocross and rally car events. Some of these activities create noise and additionally noise from farm machinery and forestry work such as the use of chainsaws will undoubtedly feature from time to time. Commercial and military aircraft fly over the area and a helicopter flies over the area regularly to inspect a gas pipeline running through the park. The National Park is therefore subject to a combination of natural and man-made sounds. This report will consider if the development proposed would significantly detract from or change the ambient soundscape.
- 3.2 The proposed grass runway is located on land at South Moor Farm and approximately 500 metres from the nearest residential property at Jingleby Farm to the South. A bridleway runs North from Jingleby Farm up to the field boundary of South Moor farm and at the end of the proposed grass run way.
- 3.3 Figure 1 below shows the site location and surrounding features.



- 3.4 The aim of this report is to quantify the impact of the use of a grass airstrip by comparing the existing soundscape with aircraft taking off and landing at the site with a view to addressing the objections raised against the proposal. It also considers this in context with what can arise with the need for planning consent.
- 3.5 This study involves a background noise assessment on land at South Moor Farm over a number of days to characterise the prevailing ambient soundscape; and the comparison of measured levels of light aircraft flying over the farm or take-off and landing at an alternative airfield.

4.0 Planning legislation and guidance

- 4.1 The National Planning Policy Framework (NPPF) came into force in March 2012 formally withdrew many key planning policy and technical guidance notes including PPG24: Noise. The NPPF sets out that it's key aim is to promote sustainable development through plan making and decision taking.
- 4.2 In terms of noise and development, the NPPF considers that the planning system should contribute to and enhance the natural and local environment by preventing new development from being put at unacceptable risk from, or being adversely affected by unacceptable levels of noise pollution.
- 4.3 The NPPF further advises that to prevent unacceptable risks from pollution and land instability, planning decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the proposed development, should be taken into account.²
- 4.4 The NPPF confirms that planning decisions should aim to;
- avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
 - mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;

² NPPF defines pollution as; Anything that affects the quality of land, air, water or soils, which might lead to an adverse impact on human health, the natural environment or general amenity. Pollution can arise from a range of emissions, including smoke, fumes, gases, dust, steam, odour, noise and light

- recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and
- identify and protect areas of tranquillity which have remained relatively
- undisturbed by noise and are prized for their recreational and amenity value for this reason

4.5 The NPPF does not define how areas of tranquillity are determined but states;

"There are no precise rules, but for an area to be protected for its tranquillity it is likely to be relatively undisturbed by noise from human caused sources that undermine the intrinsic character of the area. Such areas are likely to be already valued for their tranquillity and are quite likely to be seen as special for other reasons including their landscape."

4.6 The World Health Organisation guidelines for community noise suggest that to protect the majority of people from being moderately annoyed during the daytime the equivalent average sound energy (LAeq) should be below 50dB on balconies, terraces and outdoor living areas. To prevent serious annoyance a value of 55dB LAeq is suggested. It is important to bear in mind that these values are for steady, continuous noise of an anonymous nature such as transportation noise sources, not the noise source under consideration. They are also facade levels so when comparing to free-field measurements, 3dB should be subtracted from the guideline level.

4.7 In relation to parkland and conservation areas, the WHO do not define any specific noise levels but recognises that existing areas

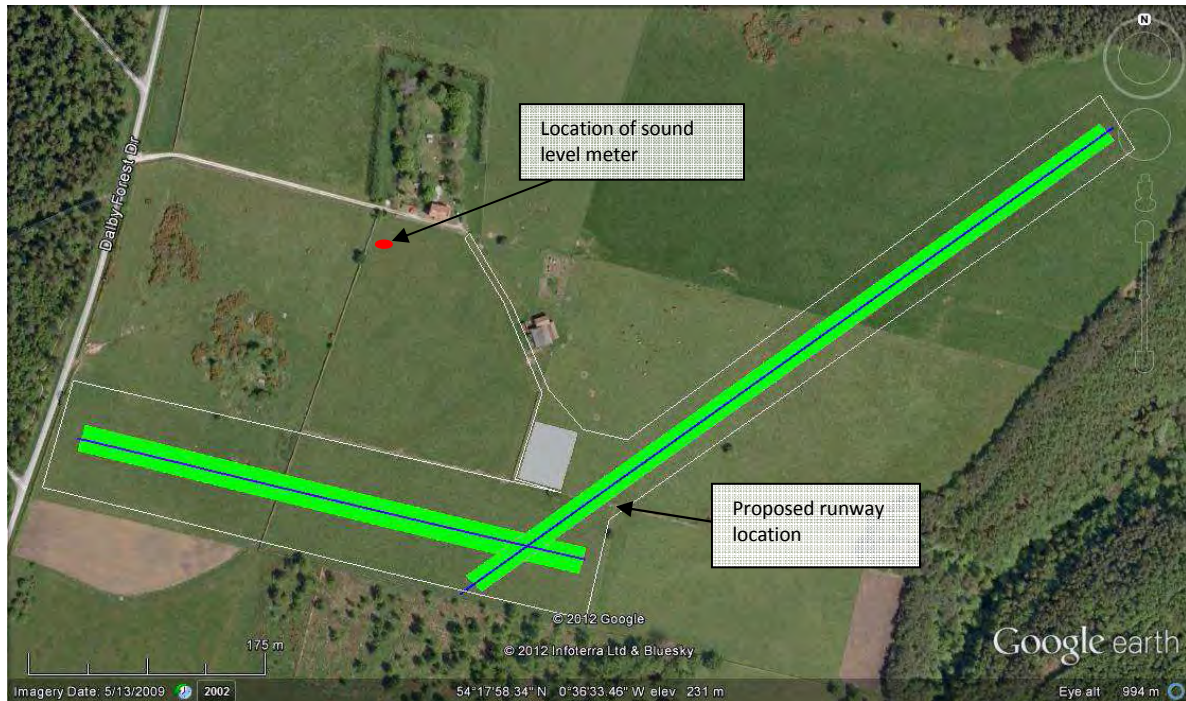
should be preserved and the signal to noise ratio kept low. This implies that loud impulsive sounds are more likely to disrupt such areas than more steady sounds.

4.8 Under the Town and Country Planning (General Permitted Development Order) 1995, helicopters and small aircraft are given permitted development rights to use temporary sites for up to 28 days in a calendar year without the need to make a specific planning application, although permanent infrastructure would require planning permission. The days may be consecutive and there is no restriction on the number of movements that may occur on any one day. There is therefore a permissible level of noise that may result from activities before which a planning application would be required. Domestic related activity also appears uncontrolled in the same way car use is not controlled. Within the application area, one would reasonably expect permitted farm diversification activities such as;

- Up to 28 days of motor sport in a year
- Clay target or game shooting.
- Up to 28 days of commercial flying whether light aircraft from a temporary strip could occur or equal helicopter activity.
- Regular use for helicopter or light aircraft when purely ancillary to the use of a dwelling i.e. as a means of transport in the same way a car can be used.
- Over-flying by military aircraft including fighter jets during training and at lower heights, helicopter training flights.
- The operation of gas guns for the protection of crops from birds.
- Shooting of vermin.

5.0 Survey of ambient soundscape and background

5.1 A Norsonic 140 sound level meter utilising an all-weather microphone enclosure was installed on land at South Moor Farm and positioned as shown in figure 1 below.



5.2 The sound level meter was set to log sound pressure level every 1/10th second as well as hourly LAeq and statistical parameters such as L90. In addition, continuous audio data was gathered in order to identify and characterise extraneous noise and the general soundscape.

5.3 The equipment was set up on the 7th November 2013 and gathered data until the 9th November 2013.

5.4 Table 1 summarises the measured background levels during the daytime with periods of rainfall or strong wind eliminated from the data³.

³ See appendix A12-A13

5.5 Table 1: Background survey summary

Date & time	LAeq, 1hour	LA90, 1 hour	Comments
07/11/13 1500-1600	43dB	37dB	Rustling of vegetation, bird song, dog barking, aircraft flies over
08/11/13 0800-0900 0900-1000 1100-1200 1700-1800 2000-2100 2100-2200	37dB 39dB 45dB 34dB 47dB 42dB	31dB 32dB 32dB 26dB 36dB 34dB	Birdsong, crow call close to microphone. Aircraft, tractor movements, rustling of vegetation. Passing road traffic Revvng of engines during rally event in forest becoming louder for periods from 2000-2030 and 2128-2157
09/11/13 1500-1600 1900-2000	35dB 37dB	28dB 28dB	Birdsong, passing motor vehicles and dog barking

5.6 The prevailing soundscape can be characterised as being dominated by natural sounds such as birdsong and the rustle of vegetation but interspersed with man-made sounds such as vehicles, farming related activities, overflying aircraft whether commercial airliner or light aircraft and other recreational pursuits.

6.0 Noise impact assessment

6.1 Measurements of the applicant's aircraft performing take-off and landing manoeuvres at Sherburn-in-Elmet aerodrome was undertaken on the 10th January 2014 to provide the source noise for this site as the results are comparative. Measurements were made 200m from the runway and gathered data of a number of different light aircraft taking off and landing. This included the aircraft used by the applicant, which is intended to be based at South Moor Farm. The data was then used to determine the level that would be experienced by the occupiers of the nearest

dwelling and users of the bridleway located close to the proposed runway.

- 6.2 In addition, measurements of the applicant's light aircraft flying over South Moor Farm whilst the background noise survey was undertaken can be utilised in the assessment of amenity impact. Flypasts are detailed in the appendix of this report labelled figures A8 & A9 on the 9th November 2013 at 1237, 1245 and 1414. Sound levels vary with engine throttle and height above ground level and the heights in this example ranged 600ft to 1700ft. Sound levels ranged 58-70dB LAmax with events lasting between approximately 2.5 to 3 minutes. LAmax(f) sounds levels are comparable to other aircraft flying over the area and as such, this aspect of the impact has negligible significance due to the short duration and typical sound level.
- 6.3 Noise events from take-off and to a lesser degree, landing on the airstrip require more detailed consideration in order to address the concerns relating to residential amenity, general amenity of the national park and possible effects upon horses and birdlife.
- 6.4 As with overflying aircraft, aircraft take-off and landings are limited to very short durations such that the hourly sound level is largely the same as without aircraft movements.

6.5 Table 2: Noise measurements of light aircraft.

Manoeuvre⁴	Aircraft	Short LAeq	LAmax
Take off	SOCATA Rallye	56dB LAeq, 40s	64dB
Landing	SOCATA Rallye	46dB LAeq, 68s	53dB
Fly past @600ft	SOCATA Rallye	52dB LAeq,186s	64dB
Fly past @800 ft (higher rpm)	SOCATA Rallye	57dB LAeq, 192s	70dB
Fly past @ 1700ft	SOCATA Rallye	48dB LAeq, 300s	58dB
Take off	Piper Cadet	59dB LAeq, 85s	70dB
Landing	Piper Cadet	47dB LAeq, 35s	49dB
Take off	SOCATA Trinidad	63dB LAeq, 63s	71dB

6.6 The table of measured aircraft data shows that the applicant's aircraft was quieter than the Piper Cadet and SOCATA Trinidad. The reference time of each aircraft movement lasted for as long as the aircraft was audible from my position 200m down wind of the runway. Assuming two take-off and landings per hour, using the Cadet and Trinidad data as a worst case, the LAeq, 1 hour at the nearest noise sensitive premises, approximately 500m away

⁴ Take off and landings measured 200m downwind of Sherburn aerodrome runway. Fly pasts were directly overhead of position at South Moor Farm

is 38dB LAeq,1hr. This level is typically equal to or below the prevailing ambient level ranging 7dB(A) below to 4dB(A) above.

- 6.7 Based on the applicant's aircraft making a recreational flight lasting 1 hour including take-off and flying away from the area then returning to land, the LAeq, 1hr is 29dB at the nearest noise sensitive dwelling, and significantly below the prevailing ambient levels.
- 6.8 Noise levels of aircraft landing are much quieter than take-off, therefore it is recommended that aircraft taking off should be restricted to ten take offs on any day during daylight hours to protect residential amenity and the amenity of the national park. This is a precautionary measure ensuring audibility for only about 20 to 40 minutes per day.
- 6.9 The impact upon horse riders is best quantified by the rate of decibel rise and maximum (LAm_{ax}) indices rather than LAeq alone.
- 6.10 A bridle way runs along the boundary of South Moor farm and although apparently used infrequently by horse riders, there is public concern regarding the possibility that horses may be spooked by the noise of aircraft resulting in an accident. Much of the documented evidence of incidents involving horse riders and aircraft concern low flying military aircraft approaching at much higher velocities than the light aircraft under consideration.
- 6.11 The British Horse Society (BHS) maintains a database of incidents involving horses that riders can report details of incidents ranging from low flying aircraft, a road accident, dog attack, bird scarer or slippery road surface for example. An online map view⁵ on the BHS website shows that in the vicinity of the North York Moors

National Park that there were 4 road traffic incidents reported between 1998 and 2007, 2 dog attacks each in 2007 and 2011. The closest low flying aircraft incident reported was in 2007 some 15 miles to the West of the National Park. It appears that generally incidents involving low flying aircraft are relatively rare in the Yorkshire area, especially compared to other incident categories such as road traffic incidents, bird scarers and dog attacks.

- 6.12 A literature review reveals the equine hearing spectrum is less sensitive than that of humans at the frequency range of the light aircraft identified in this case. Their hearing is more sensitive at ultrasound frequencies but these are not relevant to the noise producing activities in this case. The review also revealed information on damage to horses where there are low over flights (less than 50m) *"all the mares in these studies exhibited strong fright responses but were eventually able to habituate to the overflights, even helicopters hovering 50 feet over their heads ...trauma due to panic can occur after an overflight in naive horses. The incidence of such losses is still unclear, but is likely to be low. Young horses seemed to be most susceptible probably due to lack of experience"*⁶
- 6.13 These research findings relate primarily to low level high speed jet aircraft overflights and helicopters which appear to be recognised as the most intrusive form of flying to horses. In 2003 there was a documented case in the UK where a lady out riding in Lincolnshire died after her horse bolted when a Chinook helicopter allegedly flew over the rider at a height of about 10 metres. A

⁵ http://www.horseaccidents.org.uk/View_Incident_Locations.aspx

⁶ USAF Research Laboratory report January 1990 - The Effects of Aircraft Noise and Sonic Booms on Domestic Animals - A Preliminary Model and a Synthesis of the Literature and Claims

Chinook is 30m long and thus an object overhead at this height will occupy about 70 degrees of the skyline as it passes overhead. Even at 20m distance it occupies a line about 56 degrees of the skyline. The evidence in that case was of the wind effects, and blackness caused by the shadow which caused the horse to bolt.

- 6.14 An important element of noise impact is the rate of decibel increase in the noise per second. It is recognised that where aircraft noise rises at rates of 30-40dB per second, a startle reaction is expected within humans. Typically a car driving reasonably fast past a location 15m from a highway will cause a rate of rise of about 4dB per second. In this case the rate of rise is commonly less than 2dB per second and considering the worst brief period of increase in noise level is only 11dB per second. The noise change is therefore substantially below any levels expected to give rise to startle effects in humans and in relation to horses is substantially below the rate of change in decibel level or startle effect experienced with military low level flying or which could occur with temporary motor sporting or shooting activity.
- 6.15 I understand that where flying is for commercial use then the activity can arise for a period up to 28 days in a year without the need for planning permission. Many activities can arise without the need for planning permission as they are deemed permissible under the Town and Country Planning Acts up to certain limits. For example, the applicant could fly a helicopter with greater noise impact or light aircraft if for personal use or up to 28 days in the case of commercial use without any constraint on the amount of activity on those days. This application does therefore need to be considered in context of what can arise and also what the impact of concern actually amounts to.

- 6.16 Whilst the noise from light aircraft overflights or take-off and landings is less likely to spook horses by virtue of their smaller size, lower velocity and rate of increase in decibel level on approach compared with military aircraft, there is specific consideration required regarding the bridleway that crosses the end of the proposed runway. The applicant proposes to fly a windsock when aircraft are flying and will erect appropriate signage along the bridle path to inform users. This can be controlled by condition. An orange wind sock on a mast will be clearly visible and this approach seems reasonable and adequate.
- 6.17 With regards to impact upon nesting birds in the National Park and the SSSI, in general, having studied ecological sciences and an interest in wildlife conservation, I can advise it seems unlikely that the activity proposed would be significant in both noise levels and duration to materially interfere with nesting and foraging of birdlife. As previously discussed, there is already an amount of activity in and around the National Park that is noisy from time to time and it is expected that there would be some habituation to common sounds.

7.0 Conclusions

- 7.1 The findings of this study indicate that the proposed development for a grass airstrip with associated hanger can operate without materially detracting from residential amenity or the amenity of the National Park in terms of noise impact. Furthermore, having discussed the concerns regarding the effect upon horses and more generally the impact upon birdlife, the development could take place with appropriate mitigation on the bridleway. Signage and a flag or wind sock to indicate flying is taking place would allow horse riders to anticipate the presence of aircraft and engine noise before hearing it.
- 7.2 Additionally the controls put forward by the applicant to limit noise impact such as restricting the number of movements per day, no night time flying can be conditioned. MAS recommend that a condition limiting aircraft movements to no more than ten take offs and ten landings per day along with a recommended weekly limit of 40 take-offs and 40 landings to ensure the extent of impact is limited to the personal activity of the applicant and for some aircraft storage, is considered. This would provide a high level of amenity protection compared to activities that may occur in the National Park without planning restrictions which could arise from military training flights, domestic helicopter flights or motorsport events.

8.0 Appendix

Figure A1: Background noise survey 7th November 2013 1500-1600

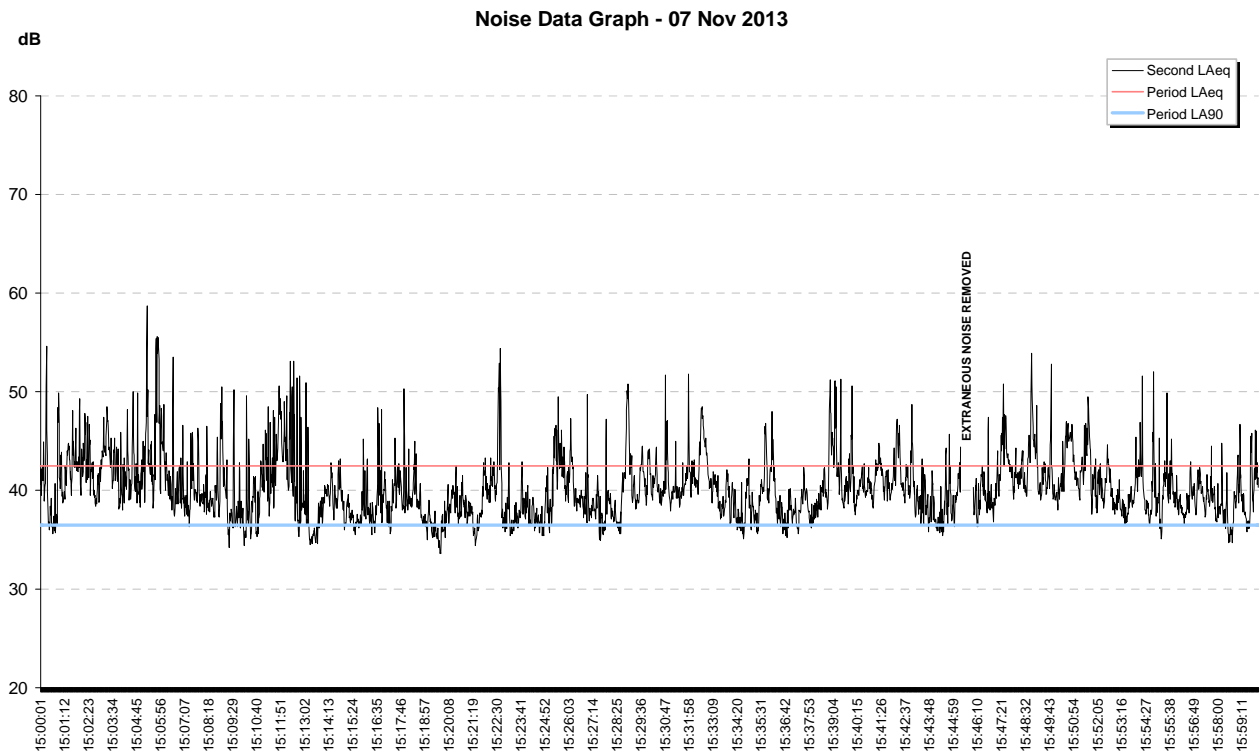


Figure A2: Background noise survey 8th November 2013 0800-0900

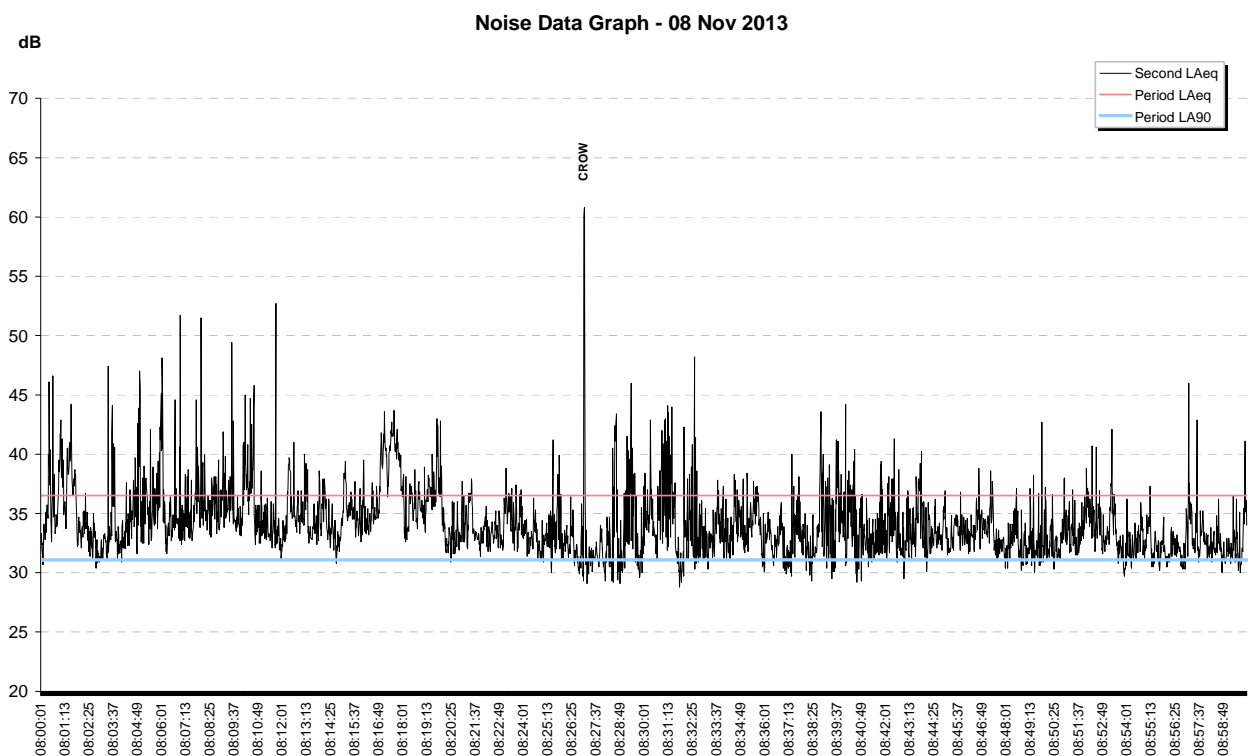


Figure A3: Background noise survey 8th November 2013 0900-1000

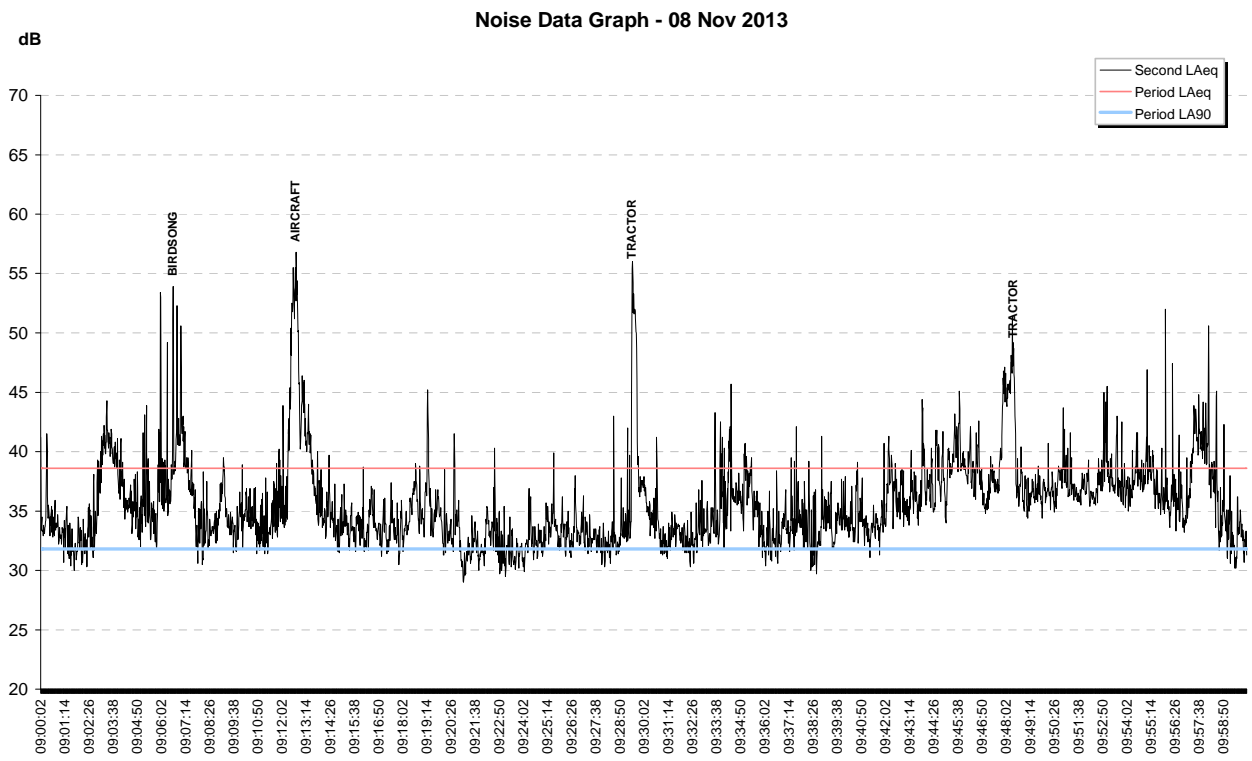


Figure A4: Background noise survey 8th November 2013 1100-1200

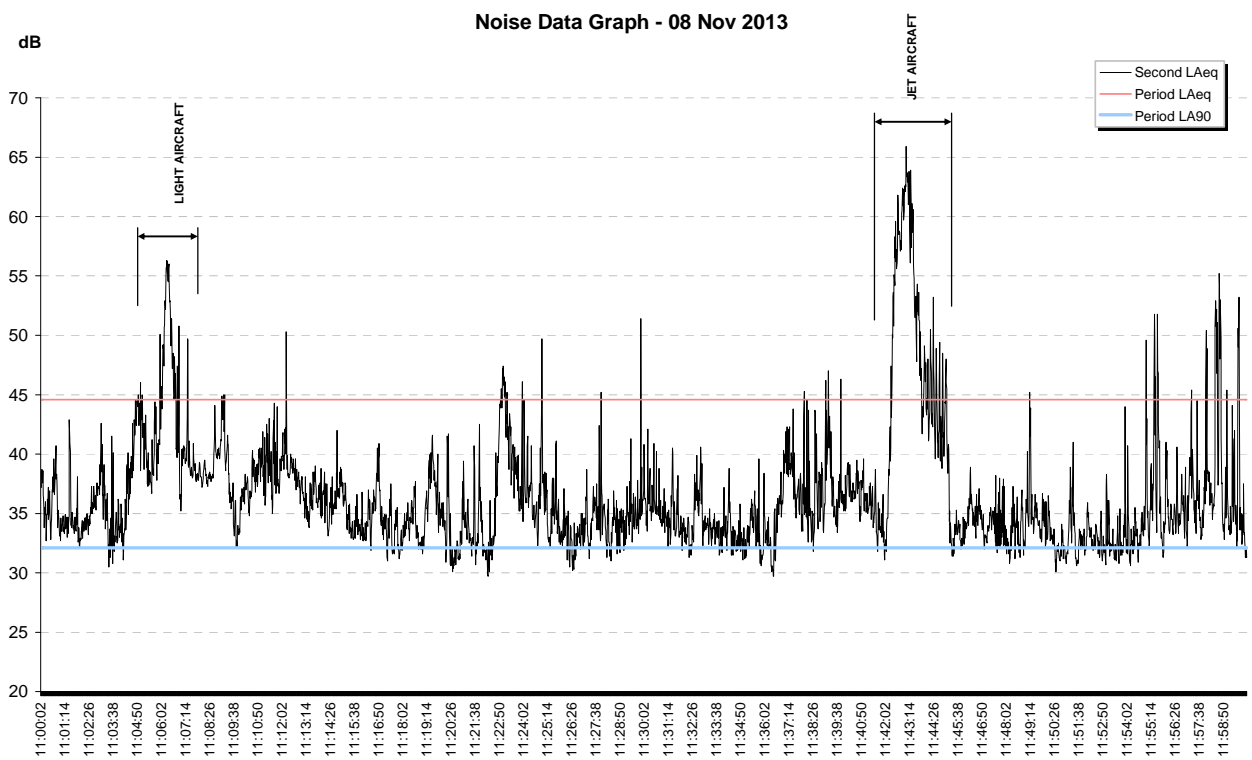


Figure A5: Background noise survey 8th November 2013 1700-1800

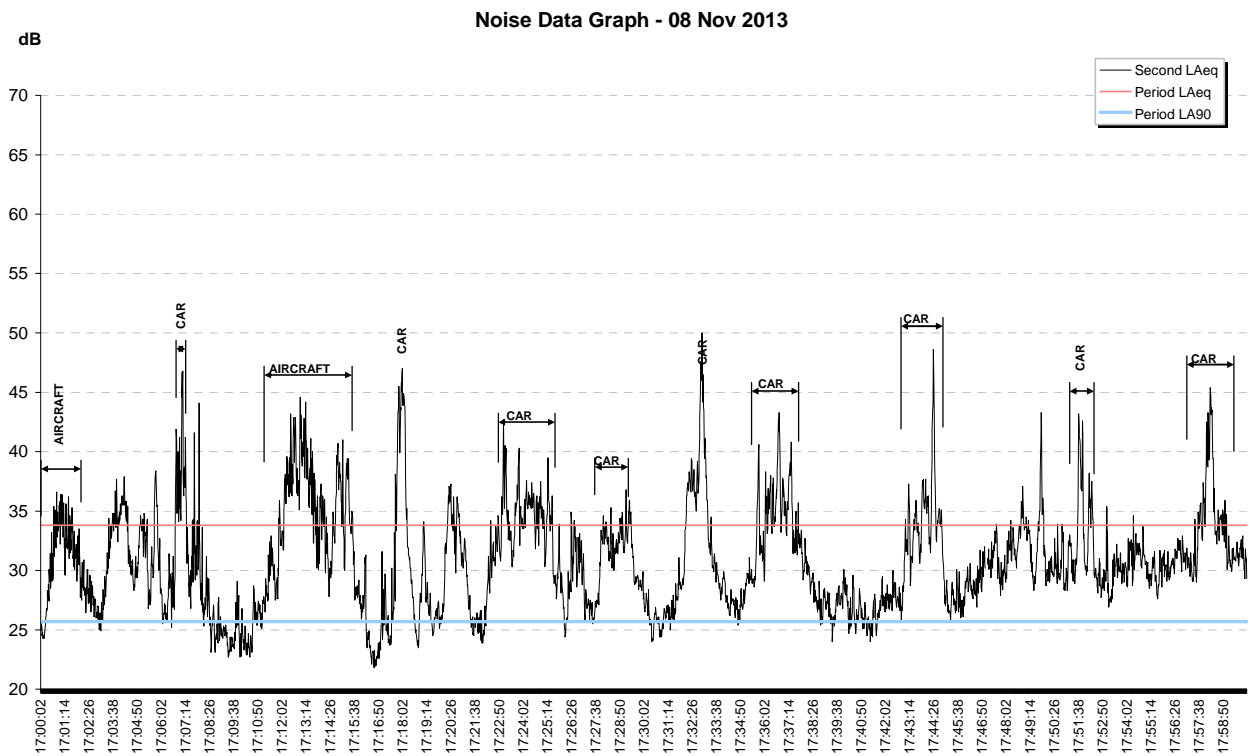
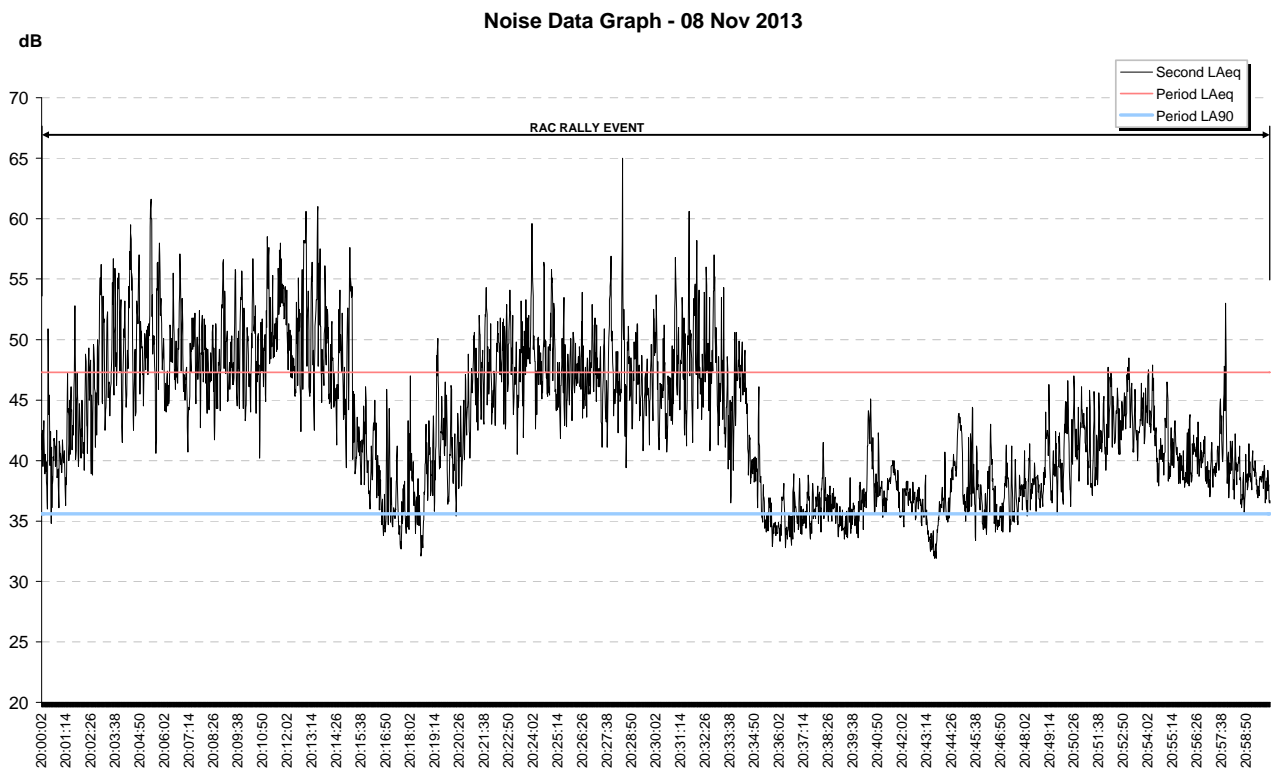


Figure A6: Background noise survey 8th November 2013 2000-2100



The rally event occurring in Dalby forest and despite being audible throughout the period, engine noise varied in sound level in relation to the location cars to the monitoring location at South Moor Farm. The revving of engines as the vehicles move closer to the monitoring location is evident in the first 30 minutes of figure A6 and last 30 minutes in figure A7.

Figure A7: Background noise survey 8th November 2013 2100-2200

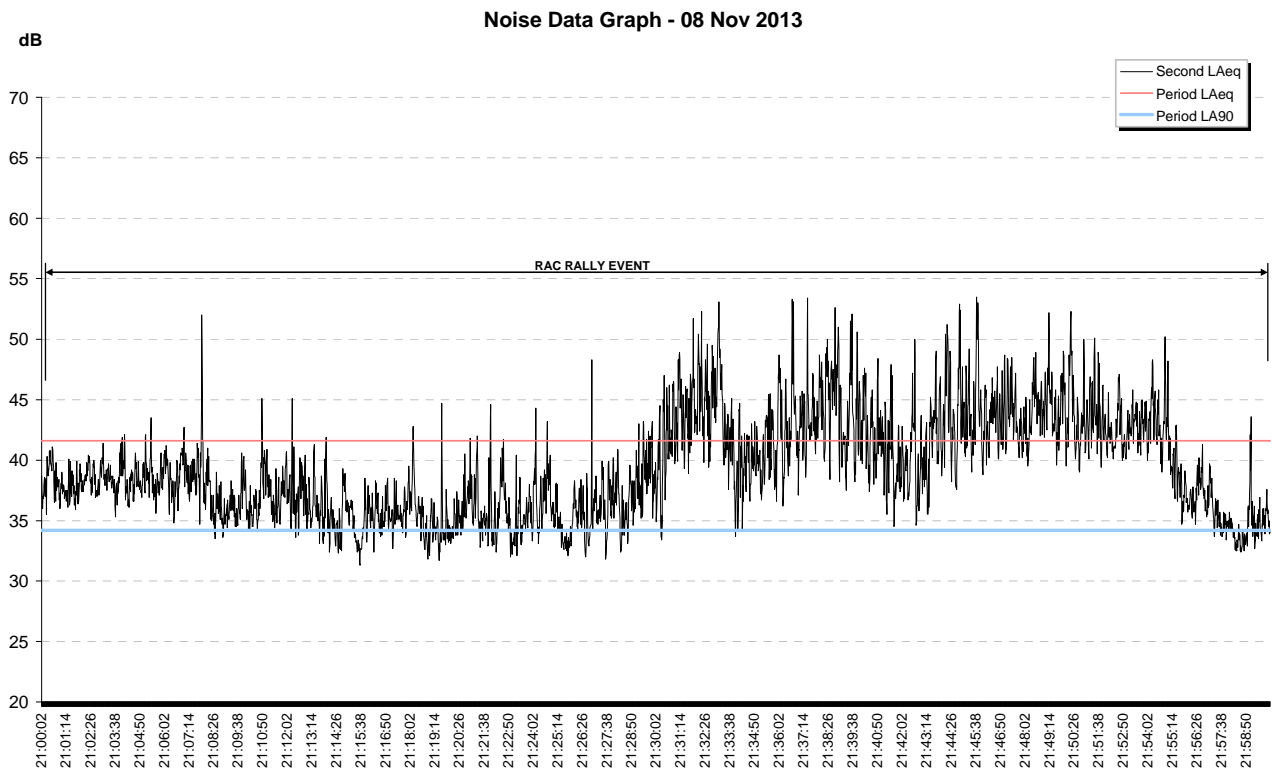


Figure A8: Background noise survey 9th November 2013 1200-1300

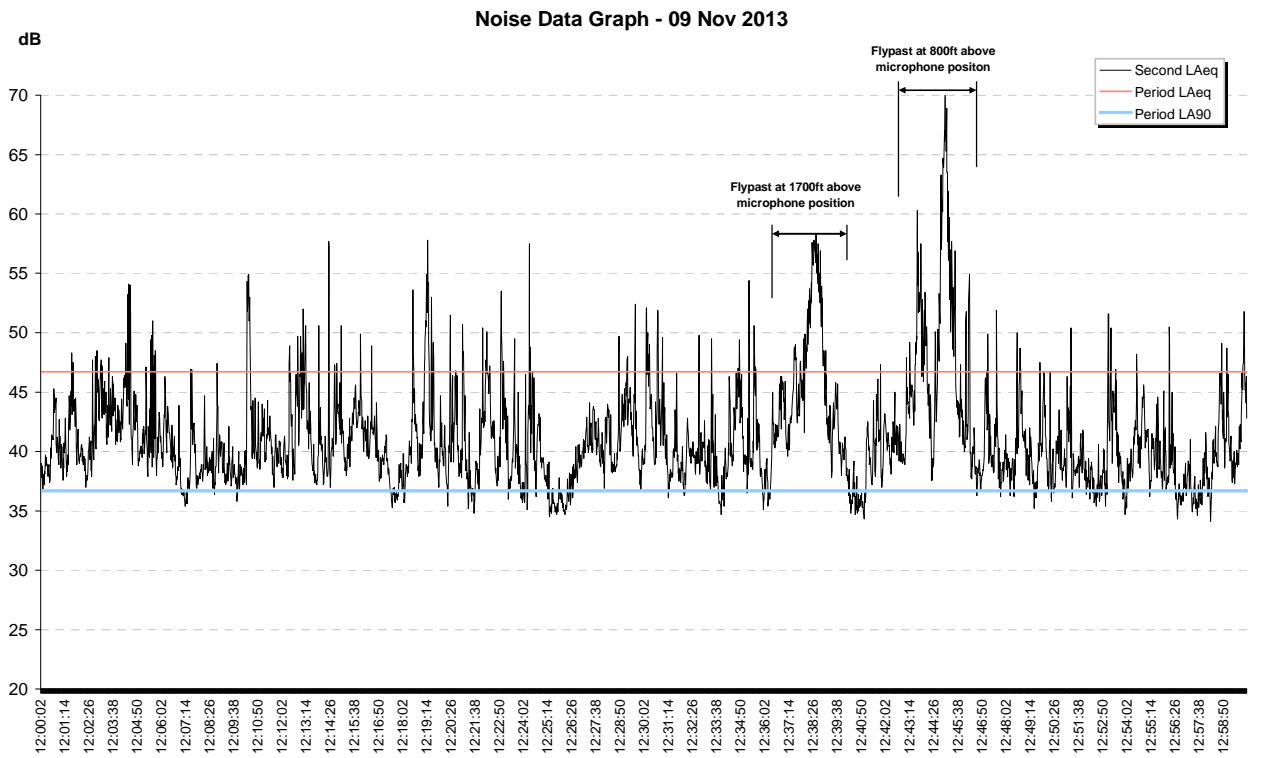


Figure A9: Background noise survey 9th November 2013 1400-1500

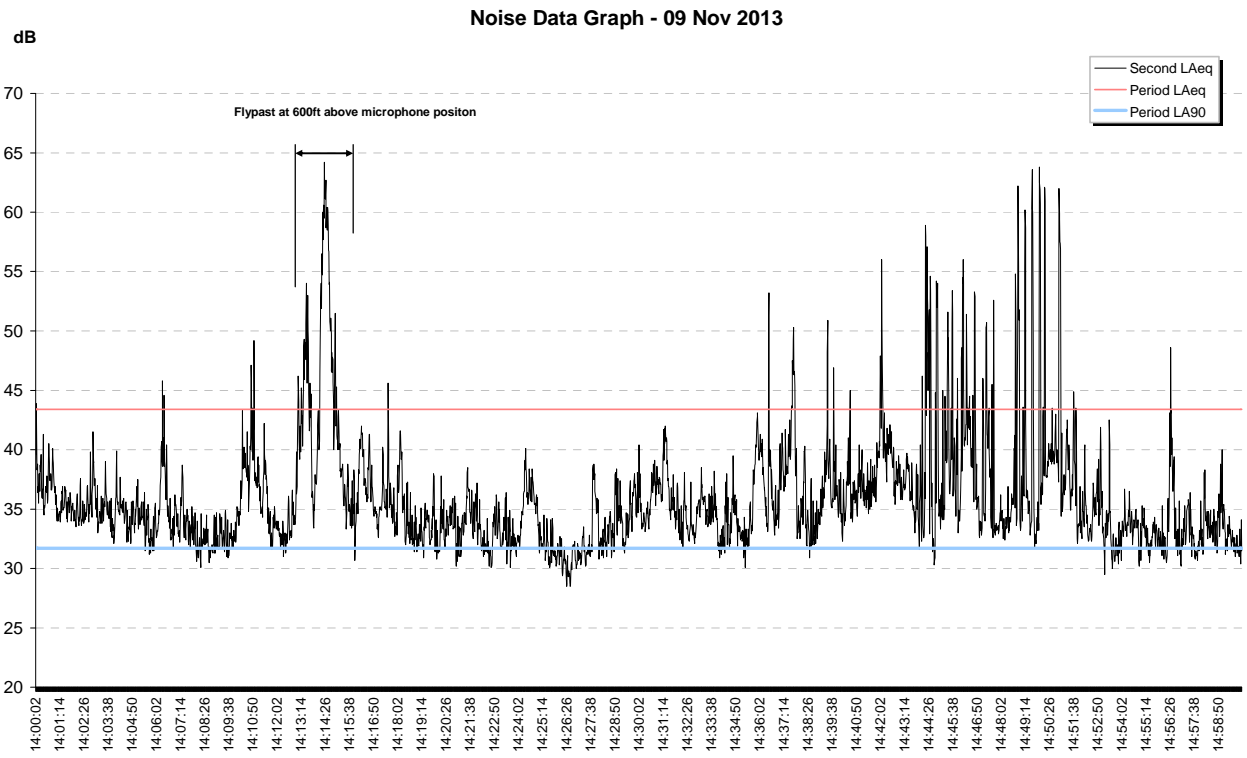


Figure A10: Background noise survey 9th November 2013 1900-2000

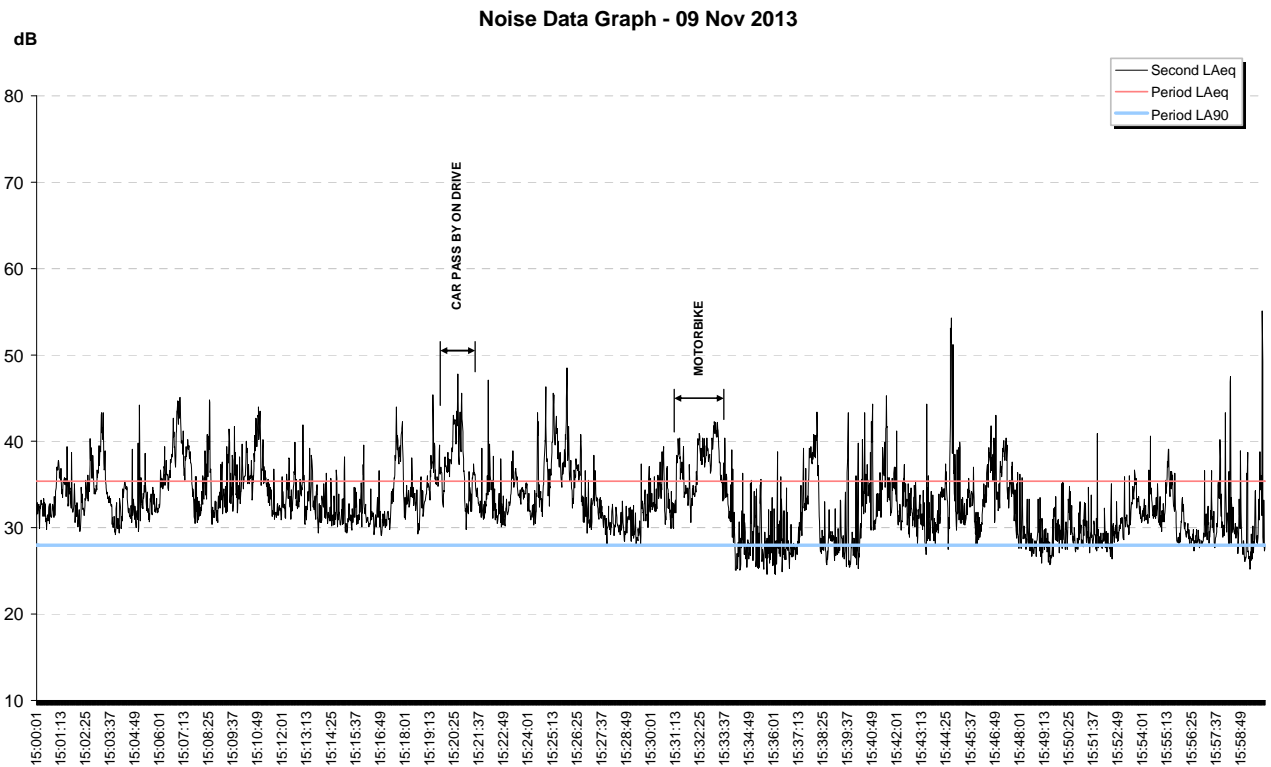


Figure A11: Background noise survey 9th November 2013 2000-2100

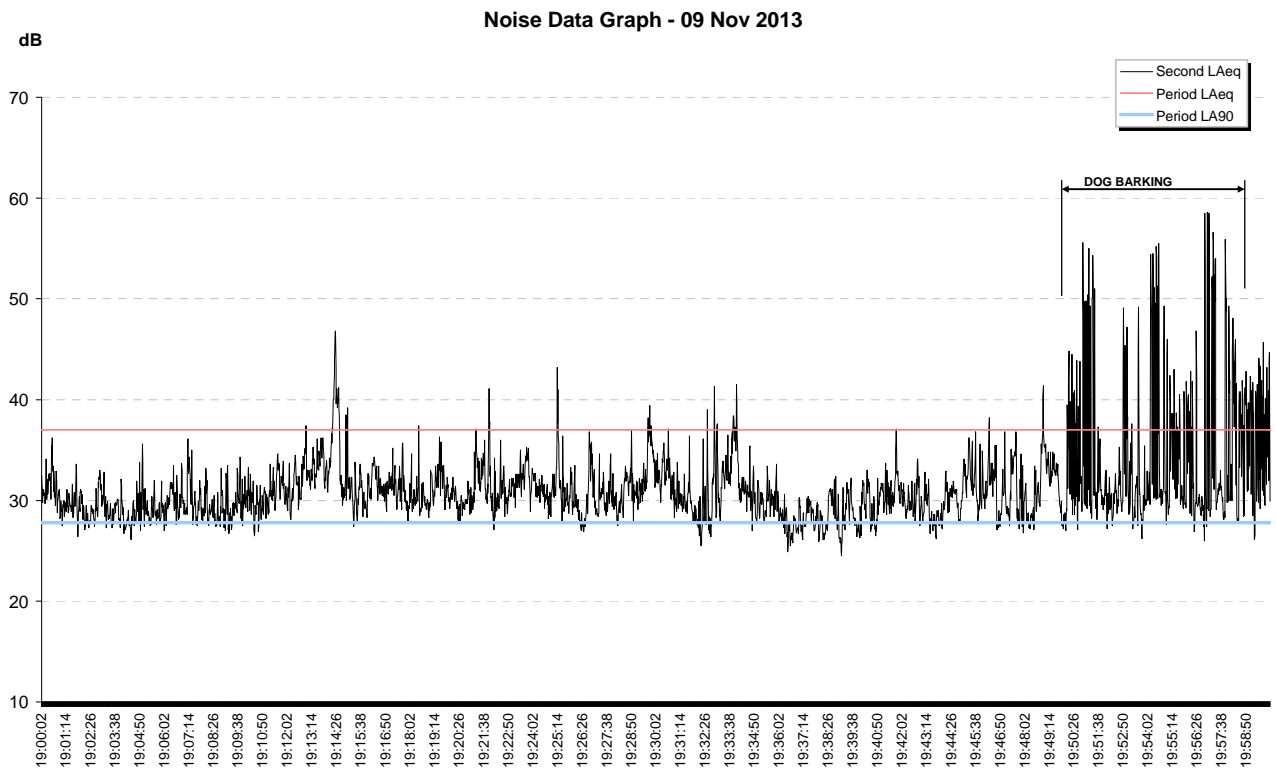


Figure A12 Weather conditions during background noise survey

Date & time	Temperature °C	Wind speed m/s	Wind direction	Observations at RAF Linton on Ouse
07/11/13 1500-1600	10-11	5	SW	Scattered cloud
08/11/13 0800-0900	6	3	S	Broken clouds
0900-1000	6	2.5	S	Broken clouds
1100-1200	7	2	SE	Overcast clouds
1700-1800	7	1.5	SW	N/A
09/11/13 1900-2000	5	2.5	WSW	N/A
2000-2100	4	2	WSW	

Figure A13 Weather conditions during measurements of aircraft at Sherburn airfield

Date & time	Temperature °C	Wind speed m/s	Wind direction	Observations at RAF Linton on Ouse
10/01/14 0945-1200	5-6	2-5	SW	Broken cloud

Appendix A14

Qualifications and experience of Simon Clothier

I have over 11 years experience working for Local Authority environmental health departments acting as the noise specialist dealing with complaints as well as advising planning departments on the impact of development that may cause or be affected by adverse noise impact. Some of the projects I have been involved with in the past include the impact of new waste transfer sites, numerous residential developments affected by commercial and/or road or rail transport sources and the Leeds arena development.

I have a MSc in Environmental Health and diploma in Acoustics and Noise Control. I am also a member of the Institute of Acoustics.