Dean Walters

Senior Environmental Manager

Environmental and Ordnance Liability Management

Environment & Planning Support

DIO SEE

Kingston Rd

Sutton Coldfield

Birmingham

B75 7RL

[MOD] E-mail: dean.walters114@mod.gov.uk

Defence Infrastructure Organisation

OFFICIAL-SENSITIVE

Elizabeth Parsons
Station Environmental Protection Officer & Sustainability Lead
Room 22
Building 24
RAF Brize Norton
OX18 3LX

24 November 2020

Dear Lizzy,

Noise Measurement Exercise – RAF Brize Norton

Background

1. RAF Brize Norton is home to 5800 active Service Personnel, approximately a fifth of the regular Royal Air Force.
2. All serving personnel are part of the structure who provide the capability needed to ensure the security and defence of the United Kingdom and its territories and to support the Government's foreign policy objectives, particularly in promoting international peace and security.
3. In order to maintain a fit, qualified and capable workforce, there are mandated training packages that all personnel have to complete annually, including qualifying to fire small

arms. To meet this commitment, the 25 metre range at RAF Brize Norton can have up to 25 people per day (week days) firing on it to ensure that personnel are fully qualified.

4. RAF Brize Norton has been working very hard to reduce the amount of times the range is utilised in order to ensure the impact of training upon local residents is minimised, particularly at night and over the weekends.
5. However, the number of noise complaints from local residents relating to gun fire has increased over the past couple of years. It was therefore decided that a noise measurement exercise should be carried out to quantify the levels of noise from gunfire at the range, in the vicinity of the village of Black Bourton.

Methodology

6. To assess the noise levels a site visit was made on the 5th November 2020 which was identified as being a significant period of representative firing programmed for that day. The monitoring location chosen was on the public footpath, off Burford Road, adjacent to an area of paddocks. This was closer to the range than the properties on Burford Road and less affected by traffic noise. The monitoring location can be seen marked in red on the map in Appendix A. This was approximately 920 metres to the west of the range.
7. At the start of the monitoring period it was relatively still, with a very slight easterly breeze, 3 mph wind speed, and a temperature of around 7 degrees Celsius was recorded.
8. A Cirrus Optimus, Type 1, Sound Level Meter was used for the measurement period and calibrated before and after monitoring using a Cirrus CR:515 Class 1 calibrator.

Results

9. The graph in Appendix B shows the levels recorded during the whole of the monitoring period which started at 10:32 and ceased at 13:47. The recorded level for the whole period was found to be 51.2 dB LAeq. The peaks visible in the graph were not found to be related to rifle shots above this level.
10. Firing at the range commenced at 11:55. The ambient level before shooting was actually slightly higher, at 52.4 dB LAeq1hr, and this may have been due to what appeared to be some engine ground running noise at RAF Brize Norton and a couple of vehicles travelling from the farm and to the paddock prior to firing at the range. The other main sources of noise at the site were birdsong, aircraft, passers-by, and horses neighing at certain points through the whole of the monitoring period.
11. Audio recordings were also made during the monitoring period. Analysis of the recordings enabled the gunshots from the range to be correctly identified and any affected by higher residual noise were filtered accordingly.
12. There is no legislation or guidance which specifies limits for gunfire noise levels in the environment. However, a methodology used in the Chartered Institute of Environmental Health (CIEH) Guidance on the Control of Noise from Clay Target Shooting can be applied to derive an indicative shooting noise level. This has been carried out for noise from the 25 metre range and the results can be seen in Table 1.

Table 1: Calculation of the Logarithmic Average of the 25 Highest Shot levels

Highest 25 Shot Levels (LAeq, 100ms)	**Lshot, 1/10**	**10^**	
50.8	5.08	120226.4	
47.9	4.79	61659.5	
47.8	4.78	60256.0	
46.6	4.66	45708.8	
46	4.6	39810.7	
45.6	4.56	36307.8	
45.5	4.55	35481.3	
45.5	4.55	35481.3	
45.4	4.54	34673.7	
45.3	4.53	33884.4	
45.2	4.52	33113.1	
45	4.5	31622.8	
45	4.5	31622.8	
44.7	4.47	29512.1	
44.7	4.47	29512.1	
44.7	4.47	29512.1	
44.6	4.46	28840.3	
44.5	4.45	28183.8	
44.5	4.45	28183.8	
44.5	4.45	28183.8	
44.4	4.44	27542.3	
44.2	4.42	26302.7	
44.2	4.42	26302.7	
44.1	4.41	25704.0	
44.1	4.41	25704.0	
Total 10^(Lshot, 1/10) =	933332.3		
Mean =	37333.3		
10*Log =	45.7		
<u>Shooting Noise Level =</u>	**<u>45.7 dB</u>**		

Discussion

13. Whilst there is no specific guidance or legislation that sets out permitted levels for this type of noise there are some standards which could be looked at as comparisons. For instance, there are maximum permitted noise levels of 140 dB for occupational noise (The Control of Noise at Work Regulations 2005). As expected, all of the levels recorded in this exercise are significantly lower than occupational peak exposure limits for noise. Similarly, all of the total monitoring periods are considerably below daily or weekly limits for noise.
14. As seen in the previous section, whilst not directly comparable, one method for assessing the impact of gunshot (although this is specifically shotgun) noise comes from the CIEH Guidance on the Control of Noise from Clay Target Shooting. This takes a logarithmic average of the highest 25 shot noise levels to provide a shooting noise level. It must be stated very clearly that this is guidance that local authorities use to assess the impact of existing and proposed new clay target shooting sites upon nearby residents. Using the methodology in the guidance a shooting noise level can be calculated and this can provide an indication whether "annoyance" is likely or not at properties. It must also be stressed that annoyance is not the same as statutory noise nuisance and if annoyance is expected then this would still have less bearing on any enforcement action considered by the local authority. Military activity is exempt from statutory nuisance legislation and any subsequent enforcement action but, where possible, best practicable means should be used to minimise noise if a significant problem exists.
15. Based upon research the guidance states that at shooting noise levels below the mid 50's dB there is little evidence of significant levels of annoyance at any site, whereas for levels in the mid to high 60's, significant annoyance is engendered in a majority of sites. The shooting noise level calculated for the range was found to be lower than 45.7 dB at nearby properties and is therefore considerably lower than the benchmark for annoyance.
16. Also, as a comparison, BS8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings recommends levels of between 50 to 55 dB LAeq for external amenity areas in new residential properties. The levels found during this monitoring exercise were well below these recommended levels.

Conclusion

17. Whilst the noise from gunfire at the 25 metre range may have given rise to complaints the levels recorded show that these should not be considered to be similar to statutory nuisance or to be prejudicial to health, or found to be at levels which could be deemed as causing annoyance. No noise mitigation measures are therefore required. I understand that local residents are notified when firing at the range is due to take place to pre-warn them of the proposed activity and that weekend and night-time use is restricted where possible. I would recommend that this practice continues.

Yours Sincerely

For and on behalf of the Defence Infrastructure Organisation

Dean Walters

Senior Environmental Manager

APPENDIX A

Map Showing the Monitoring Location (Red) and RAF Brize Norton Range (Yellow)

Defence Infrastructure Organisation

Map of Monitoring Location

Legend

Name :

Date : 20th November 2020

0 25 50 100 150 200 m

0 85 170 340 510 680 ft

Map Centre Coordinates :
429,346 204,738

This map has been produced using a web-based application, definitive measurements should not be calculated from it.

N

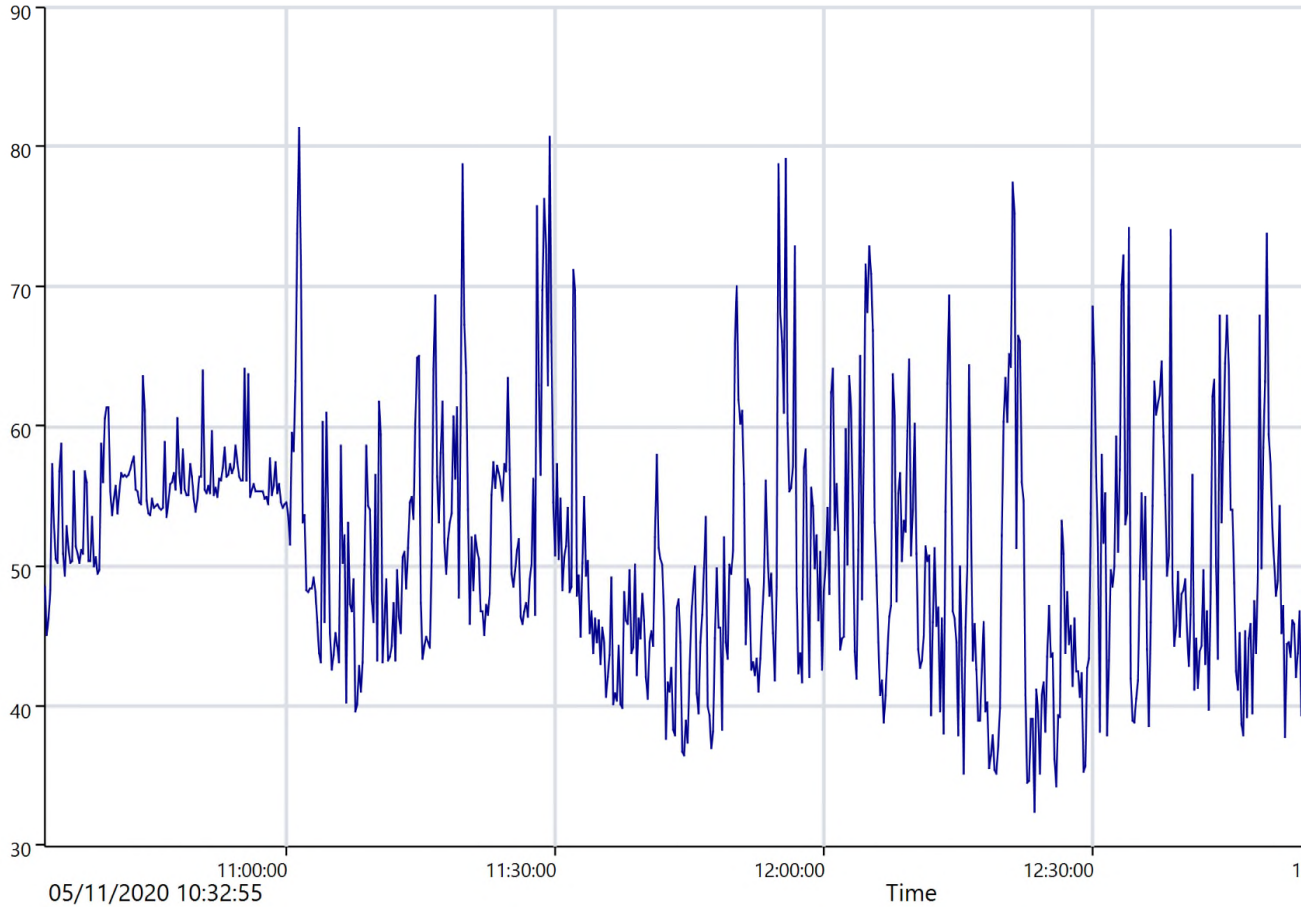
APPENDIX B

Graph Showing the Noise Levels Recorded

Measurement Time History Report

Name	1	**Time**	05/11/2020	**Duration**	03:14:45
Period	05/11/2020 10:32:55 - 05/11/2020	**Instrument**	G080909, CR:171B		

Legend	LAeq
Value	51.2



These values have been recalculated due to the large number of samples displayed.