



Aviation

Farnborough Airport Ltd

Town and Country Planning Act Section 106/299A

**Environment Report Quarter 4
October – December 2007**

TAG Farnborough Airport Ltd
Farnborough
Hampshire
GU14 6XA

1. INTRODUCTION

1.1 In continued compliance with the requirements of the agreement in place under Sections 106 and 299A of the Town and Country Planning Act 1990 between TAG Farnborough Airport and Rushmoor Borough Council, TAG hereby submits a report for the fourth quarter of 2007, (October to December 2007) detailing the results of environmental monitoring as required by that agreement. In line with the paragraph 2 (t), the content of this report was revised in consultation with Rushmoor Borough Council prior to the publication of the first quarterly report of 2007.

2. NOISE MONITORING

2.1 The two permanent noise monitoring terminals situated at Farnborough College and Tweseldown Racecourse remain in operation. The portable noise monitor was destroyed in the floods on 20th July 2007; as a result a new portable unit was ordered. The new portable equipment has been integrated into our NTMS (Noise and Track Monitoring System) and is now undergoing final calibration.

2.2 Figures 1, 2 and 3 overleaf show L_{eq} data for correlated aircraft Events, (Event), Total L_{eq} levels (Total) and Background (Background) noise, calculated as comparable A-weighted (Db(A)) values, by day of month and NMT for October, November and December respectively.

Figure 1. Noise as L_{eq} Total, Event and Background, by Day of Month and NMT for October 2007.

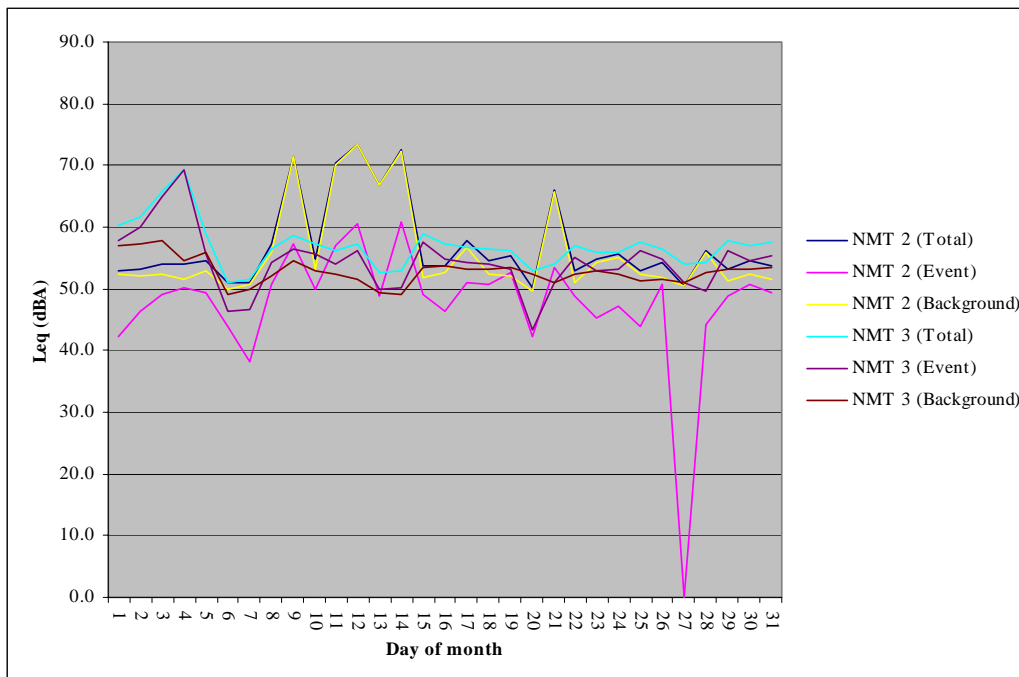


Figure 2. Noise as L_{eq} Total, Event and Background by day of month and NMT for November 2007.

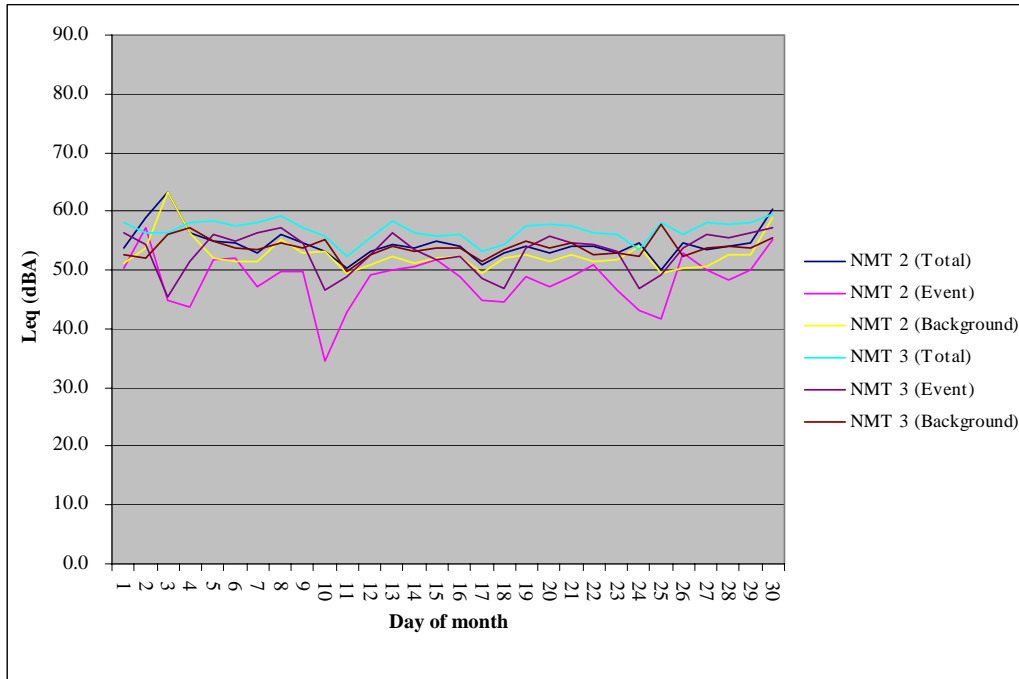
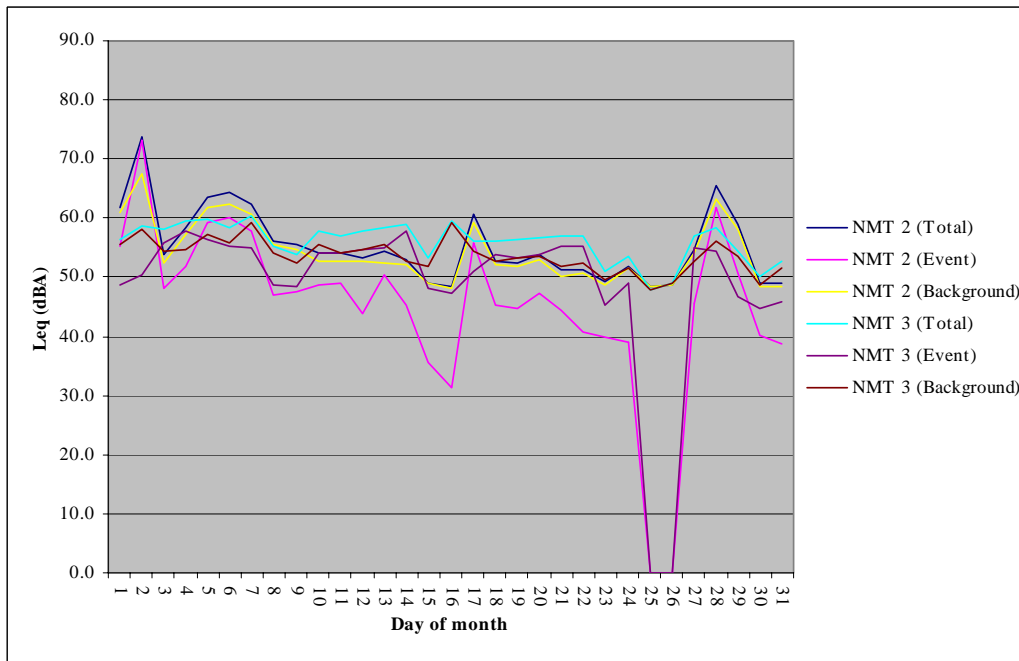


Figure 3. Noise as L_{eq} Total, Event and Background by day of month and NMT for December 2007.



2.3 Noise contours produced using the FAA's Integrated Noise Model (INM) for operations covering the entire duration of 2006 were submitted to Rushmoor in mid February 2007 in accordance with the requirements of the agreement between TAG and Rushmoor. The results of the modelling exercise undertaken are given below in Table 1, along with those included with the planning agreement. A contour covering the period January 2007 to June 2007 was submitted to Rushmoor in mid August 2007. A contour covering the period January 2007 - December 2007 in addition to predicted contours for 2008 will be submitted to Rushmoor in mid February 2008 in accordance with the requirements of the agreement between TAG and Rushmoor.

Table 1. Results of INM Modelling exercise

Leq dB (A)	Control Contours Predicted 20,000 movements (1997 mix)	Actual Contours Jan to Dec 2006 (KM ²)	Predicted Contours Jan to Dec 2007 (KM ²)
55	9.07	4.87	5.04
60	4.03	1.98	2.05
65	1.70	1.02	1.04

2.4 Use of the L_{eq} contour is internationally recognized as a means of noise measurement. A 66 dB(A) $L_{eq 16}$ indicates that the average level of noise during a 16 hour day is 66 dB(A). 66 dB(A) is quieter than the a car traveling at 38mph, heard from about 21 feet away, or from a washing machine.

2.5 The 55 dBA used in agreement with Rushmoor, is below that deemed to be the trigger of "low annoyance" in the Wilson Committee Report (1963), a report traditionally used as a method of assessing the probability of annoyance due to aircraft noise. According to research by Schultz on reaction to noise, 55dB(A) calculated as a DNL (Day Night Level) is likely to cause less than 5% of the community becoming highly annoyed.

2.6 The FAA's INM along with ANCONII has been produced to comply with the requirements of ECAC/CEAC Document 29 as specified in the proposed European Noise Directive. This Directive is still to be transposed fully into UK legislation. It is anticipated that INM will be selected as the European Standard tool for assessing noise impact from aircraft.

In accordance with the requirements of the Section 106 Agreement TAG has purchased the latest version of INM (INM 7.0), which was released at the end of April 2007.

At present this latest edition of INM cannot be used due to an incompatibility issue in relation to the INM Link Program (which allows actual aircraft tracks to be used in the modelling process). This issue has been raised with and acknowledged by the producers of INM (Brüel & Kjør) and is currently being investigated.

- 2.7 Due to the circumstances stated above TAG has used INM version 6.2 in the latest assessment to examine aircraft derived noise data. This version remains compatible with the INM Link Program allowing actual track data to be used to model Noise Contours based on aircraft movements.
- 2.8 Daily L_{eq} Figures are given in Appendix A.

3. AIRCRAFT MOVEMENTS

- 3.1 Table 2 shows all aircraft movements over the three-month period by movement category. Figure 4 gives a summary of movements by category for weekdays and Figure 5 for weekends.

Table 2. Movements summary by type.

Category	October	November	December	Quarter 4, 2007	Total 2007
Business	2344	2121	1707	6172	25101
Helicopter	96	89	68	253	1406
Subtotal (Planning Agreement Movements)	2440	2210	1775	6425	26507
Flying club	45	36	32	113	595
Military	17	17	10	44	144
Diversion	19	8	12	39	156
Other	154	72	46	272	1966
SBAC	0	0	0	0	0
Total	2675	2343	1875	6893	29368

Figure 4. Weekday Movements by Type for Quarter 4, Oct –Dec 2007

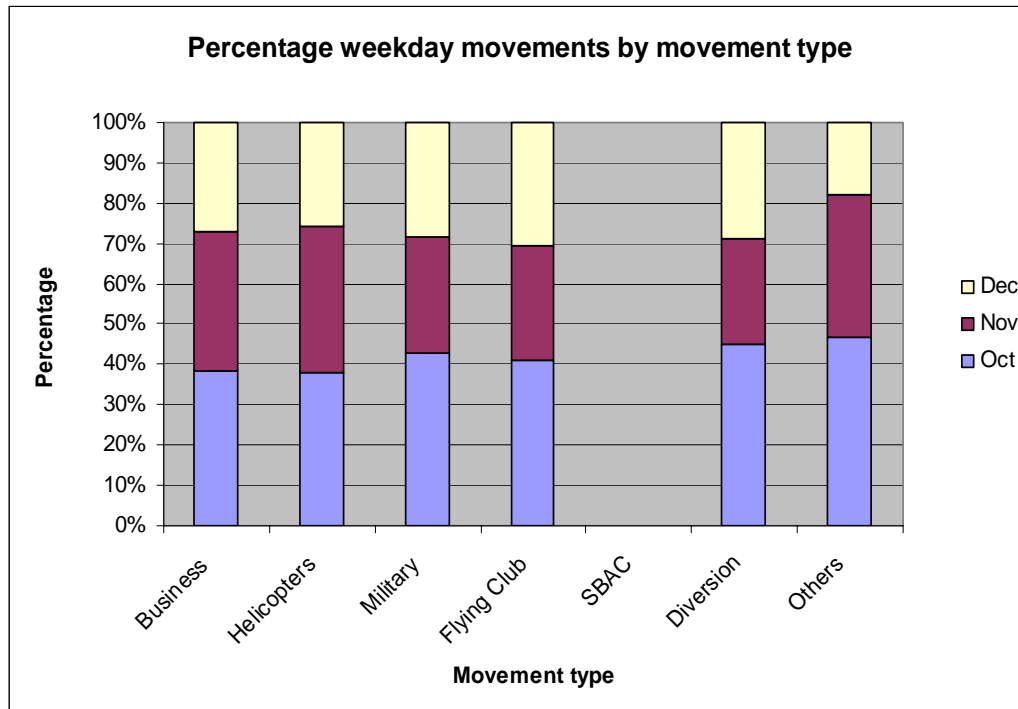
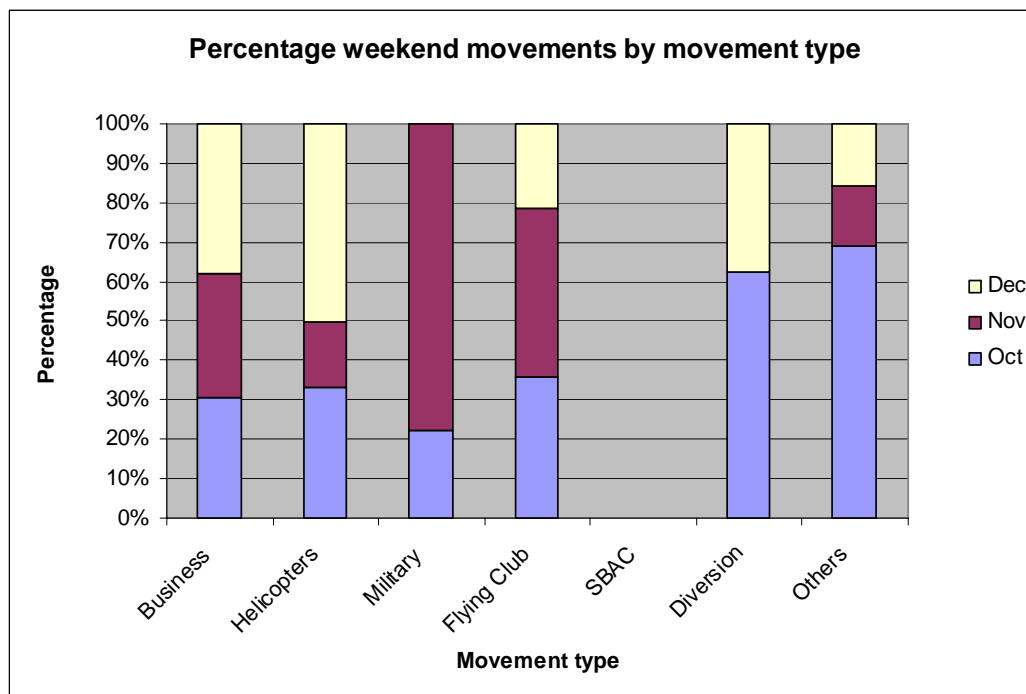


Figure 5. Weekend and Bank Holiday Movements by Type for Quarter 4, Oct - Dec.



3.2 Figures 6 – 9 display information regarding runway use including operation. Operation refers to whether the movement was a Departure or Arrival.

Figure 6. Monthly Movements by Runway Used and Operation October 2007
Key: A-Arrival, D-Departure, Other- Non runway traffic (helicopters)

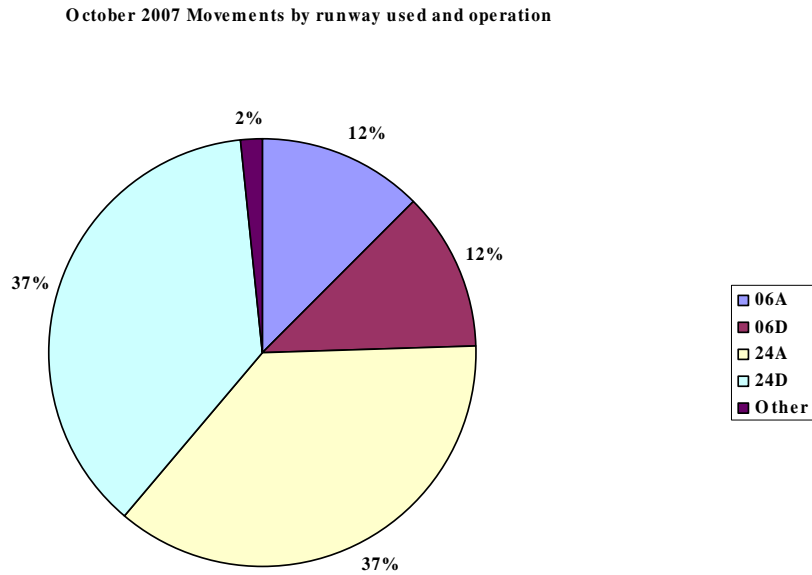


Figure 7. Monthly Movements by Runway Used and Operation November 2007
Key: A-Arrival, D-Departure, Other- Non runway traffic (helicopters)

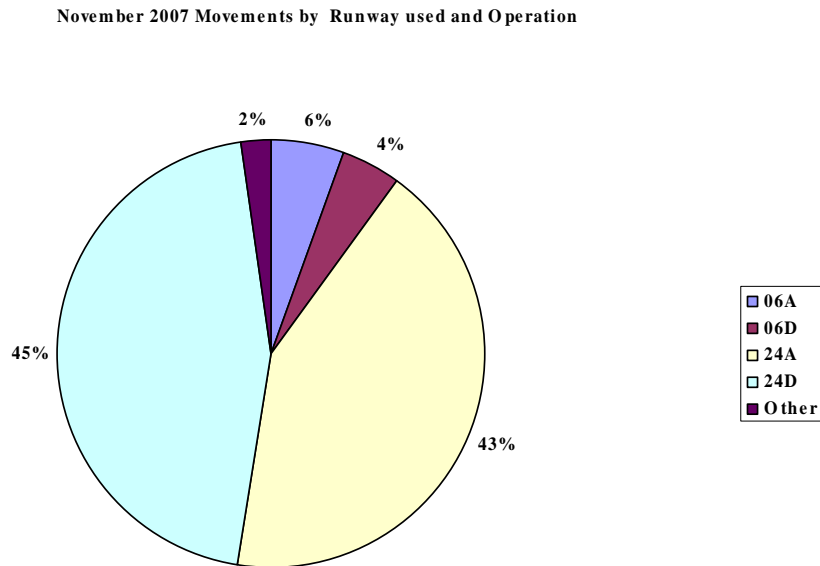


Figure 8. Monthly Movements by Runway Used and Operation December 2007
 Key: A-Arrival, D-Departure, Other- Non runway traffic (helicopters)

November 2007 Movements by Runway used and Operation

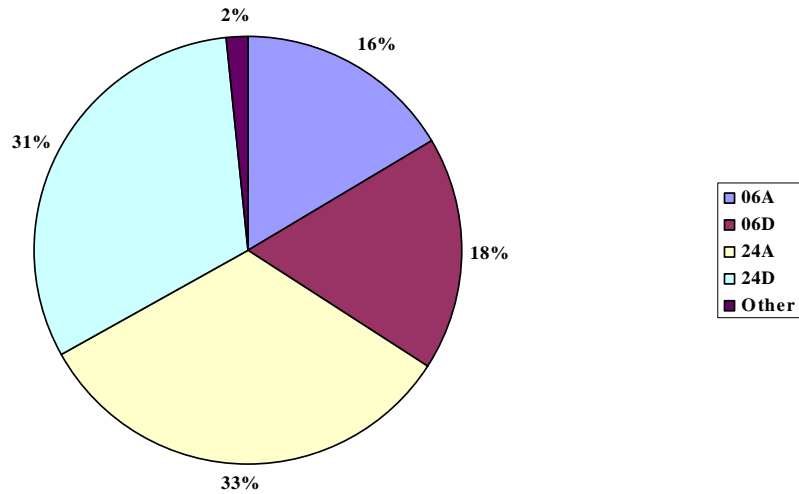
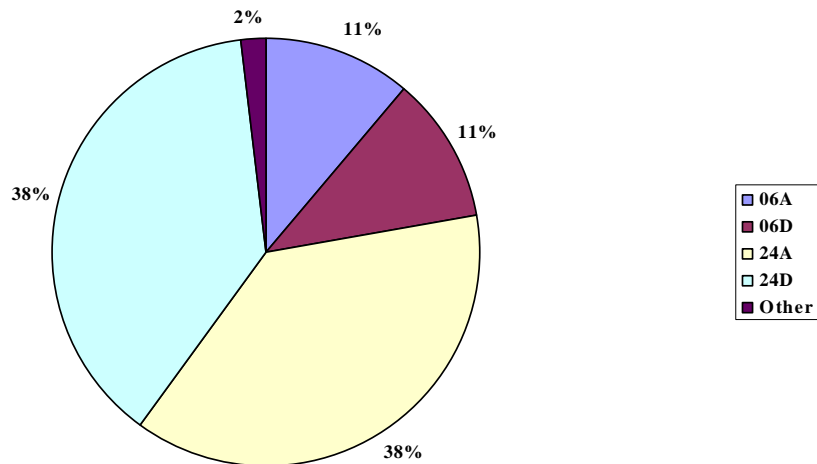


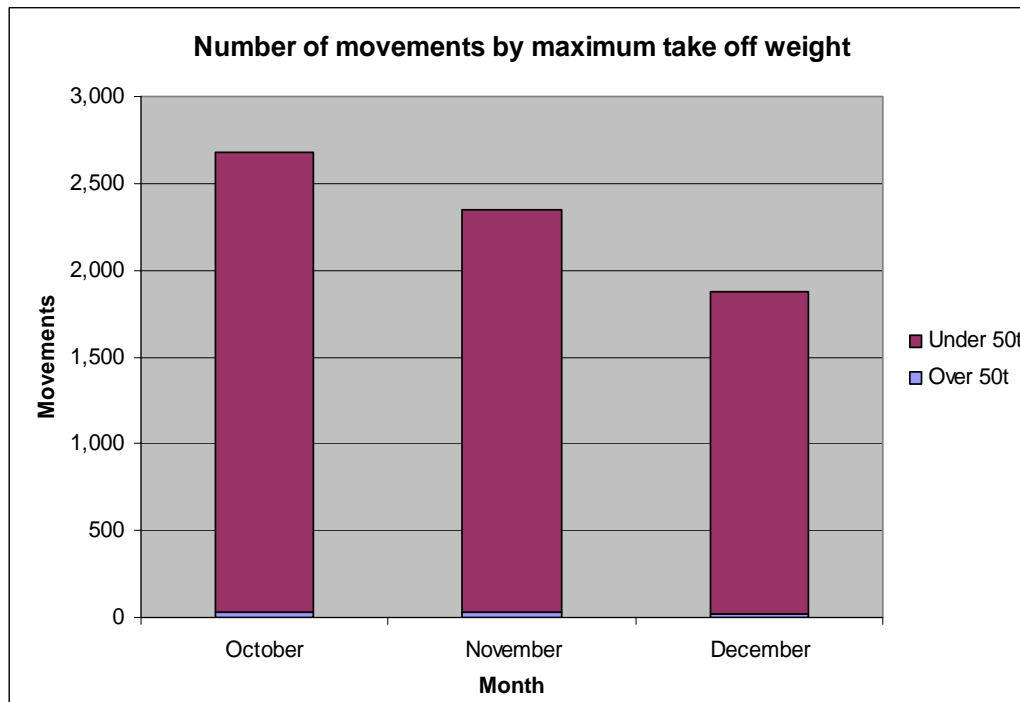
Figure 9. Overall runway usage split for Quarter 4, October – December 2007
 Key: A-Arrival, D-Departure, Other- Non runway traffic (helicopters)

November 2007 Movements by Runway used and Operation



3.3 The Maximum Take Off Weight (MTOW) is recorded by the NTMS for all fixed wing aircraft. Figure 10 gives a summary of aircraft MTOW for the fourth quarter 2007.

Figure 10. Movements by Maximum Take Off Weight (MTOW) Quarter 4, October- December 2007.



3.4 All civil aircraft using Farnborough during the fourth quarter were compliant with the International Civil Aviation Organisation (ICAO) Chapter 3 classification. Chapter classifications are calculated from aircraft noise measurements made during take-off and landing. The results of monitoring exercises are expressed as a function of aircraft mass and number of engines. All measurements are required to be below the certified noise levels in order to comply with that certification standard. Aircraft not compliant with an ICAO standard may be fitted with "hushkits" (have their original engines adjusted or replaced to comply with the required standard).

3.5 A new more stringent ICAO standard, ICAO Chapter 4 has been finalised with all aircraft manufactured from the beginning of 2006. The new classification requires aircraft noise performance, as measured by manufacturers, to fall by 10dB (A) below that required by Chapter 3.

3.6 Helicopters, light aircraft and military aircraft are not subject to the requirements of the ICAO noise certification scheme.

4. AIR QUALITY MONITORING

- 4.1 The locations of the thirteen nitrogen oxide diffusion tubes remain as previously reported. Learian Streetbox NOx monitoring resumed in October 2007 at the same locations as originally agreed with Rushmoor Borough Council. For details of the locations of the monitors, please refer to previous reports submitted prior to the first quarter of 2005.
- 4.2 Table 3 displays the standards accepted by the Government and recommended by the expert panel on air quality standards.

Table 3: Objectives to be included in regulations for the purposes of local air quality management

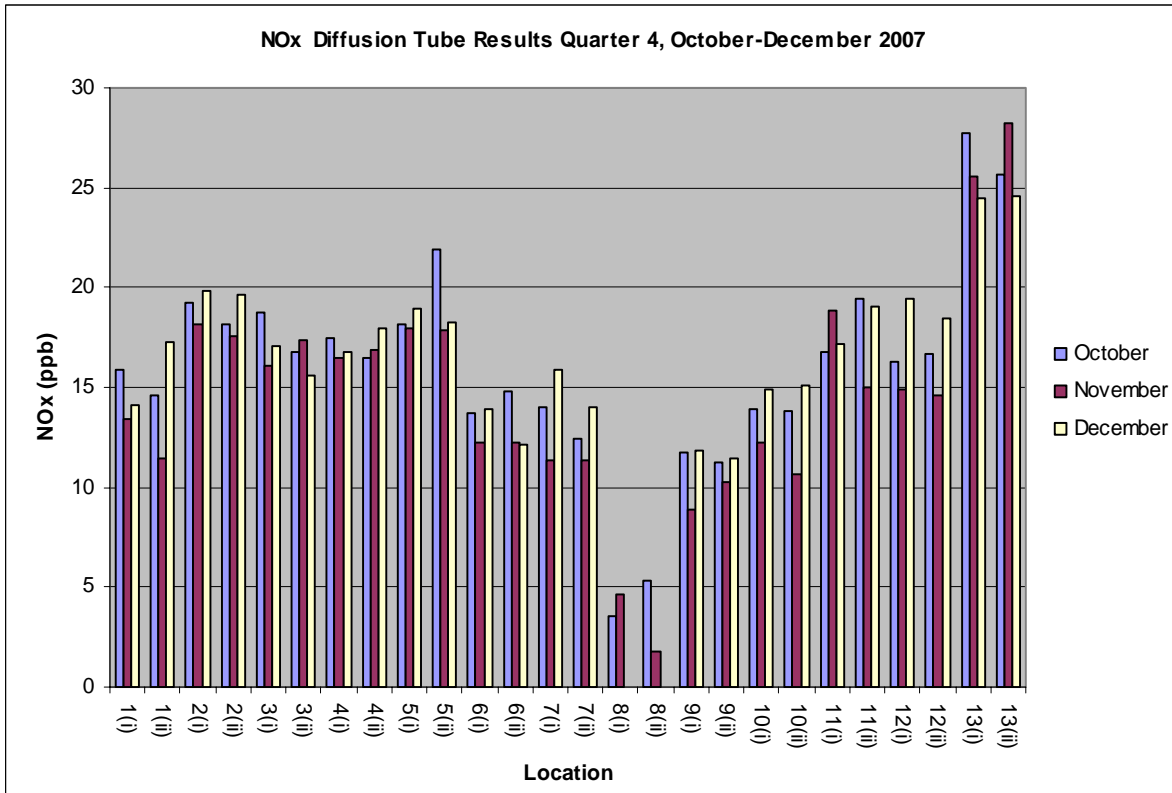
Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Nitrogen Dioxide	200µg/m ³ (105ppb) not to be exceeded more than 18 times a year	1 hour mean	31 st Dec 2005
Nitrogen Dioxide	40µg/m ³ (21ppb)	annual mean	31 st Dec 2005

^aConversions of ppb and ppm to µg/m³ and mg/m³ at 20°C and 1013mb. ppb = parts per billion; µg/m³ = microgrammes per cubic metre.

Source: *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland*. Department for the Environment, Food and Rural Affairs in partnership with the Scottish Executive, The National Assembly for Wales and the Department of the Environment for Northern Ireland, 2000.

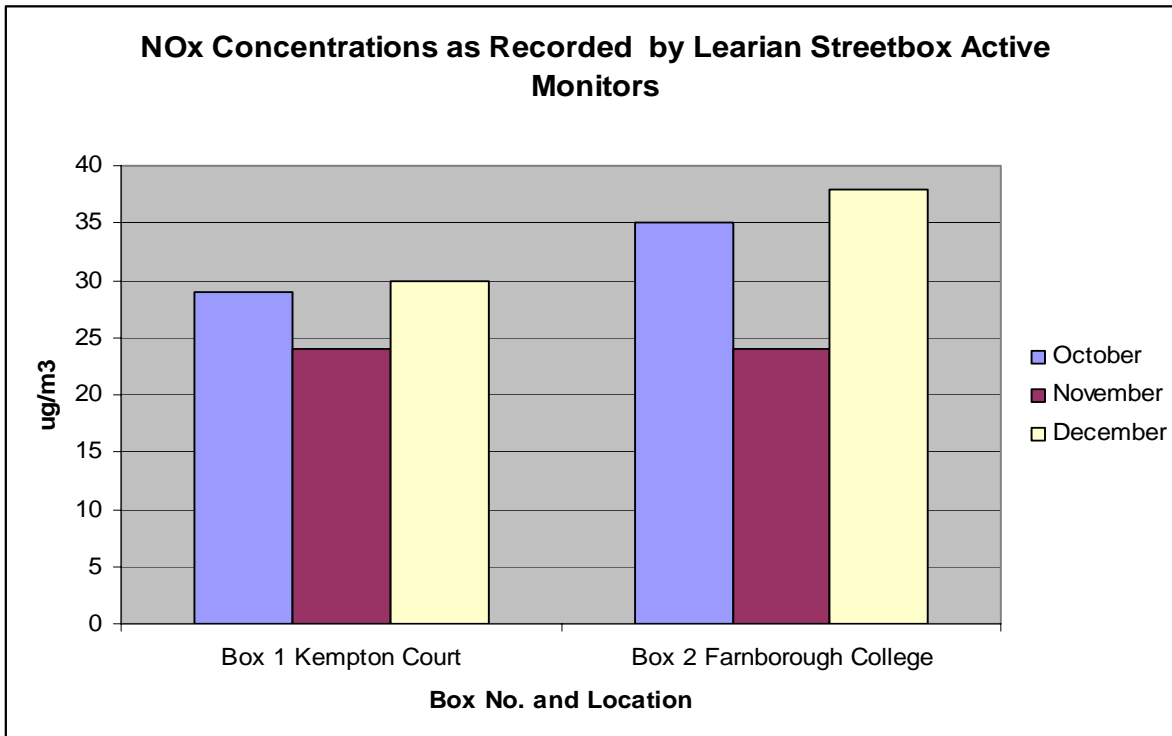
- 4.4 The results of the air quality survey consist of both raw and manipulated data taken from the diffusion tube laboratory analysis. The raw data taken from the Learian Streetbox Monitors consists of hourly mean concentrations of NOx. As this data is extensive when covering a three month period, it has been displayed for the purpose of this report as monthly means.
- 4.5 The results of both the passive and active NOx monitoring are detailed in Figures 11 and 12 overleaf.

Figure 11: Nitrogen Oxides Diffusion Tube Results Quarter 4, Oct –Dec 2007



N.B. ppb – parts per billion expressed as a monthly mean

Figure 12: Nitrogen Oxides Learian Streetbox Results Quarter 4, Oct – Dec 2007



N.B. ug/m3 expressed as a monthly mean

- 4.4 Nitrogen oxide results taken from the diffusion tubes indicate that NO_x levels around the airfield have achieved the objectives to be included in the regulations, as set out by the Air Quality Regulations. Levels recorded by the monitoring network continue to remain well below the accepted levels stated in Table 4. Learian data also shows that in the fourth quarter the monthly mean concentrations have remained below the annual mean as required by the Air Quality Regulations.

Continuing trends in the results obtained appear to indicate terrestrial sources of NO_x as the predominate source. This is illustrated by the elevated levels consistently recorded for location 13 adjacent to the M3 motorway. Location 13 lies within Rushmoor's Air Quality Management Area (AQMA), declared for nitrogen dioxide. Lowest comparative levels during Quarter 4 were recorded at locations 6, 7, 8, 9 and 10, all of which lie within the airfield boundary.

5. CONCLUSION

- 5.1 Routine monitoring of compliance with noise abatement routes, air quality targets, and aircraft movements continues at the airport. To date all monitoring undertaken has demonstrated compliance with regulatory requirements and those of the Town and Country Planning Act Section 106 Agreement.
- 5.2 All movements operated at the airport are restricted to those permitted by the terms of the planning consent and the accompanying agreement.
- 5.3 Nitrogen oxide levels recorded by monitoring remain consistent with previously noted trends. Nitrogen Dioxide levels are naturally elevated over the colder winter months compared with results obtained during the summer; this is as a result of the release of nitrates from the soils and decomposition processes.
- 5.4 The activities at the airport remain within those required by the Section 106/299A agreement.

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Appendix A.

Periodic noise reports:
Monthly

October 2007

Leq (Total) by Day of Month (by NMT)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	52,8	53,2	54,0	53,9	54,5	50,9	50,9	57,2	71,5	54,8	70,3	73,5	66,9	72,6	53,7	53,6	57,7	54,5	55,5	50,3	66,0	53,0	54,9	55,7	52,9	54,3	50,4	56,2	53,3	54,6	53,6
3	60,3	61,6	65,6	69,4	58,9	51,0	51,5	56,4	58,6	57,4	56,2	57,4	52,7	52,8	59,0	57,2	56,8	56,5	56,3	52,8	54,0	56,9	56,0	55,8	57,5	56,5	54,0	54,4	57,9	56,9	57,6

November 2007

Leq (Total) by Day of Month (by NMT)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
2	53,8	58,9	63,3	56,5	55,0	54,7	52,8	56,2	54,6	53,2	50,2	53,2	54,3	53,9	54,9	54,0	50,9	52,8	54,2	53,0	54,2	54,2	53,0	54,5	50,1	54,7	53,4	54,0	54,5	60,5
3	58,0	56,4	56,4	58,2	58,5	57,4	58,1	59,1	57,2	55,8	52,4	55,6	58,5	56,3	55,9	56,2	53,2	54,4	57,4	57,9	57,6	56,5	56,0	53,4	58,2	56,2	58,2	57,9	58,2	59,5

December 2007

Leq (Total) by Day of Month (by NMT)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	61,9	73,9	53,7	58,4	63,6	64,3	62,5	56,0	55,5	54,2	54,1	53,2	54,5	52,9	49,1	48,3	60,7	52,8	52,4	53,9	51,2	51,2	49,2	51,8	48,4	48,7	54,7	65,5	58,9	49,0	48,9
3	56,4	58,8	58,1	59,5	59,9	58,4	60,5	55,3	53,9	57,9	57,1	57,7	58,4	59,0	53,3	59,5	56,0	56,2	56,3	56,7	56,9	57,1	50,9	53,5	47,9	49,1	57,0	58,3	54,4	50,1	52,6

From 01 October 2007 to 31 December 2007

Selection criteria: NMT_NUMBER in (2 , 3)

Company:

User: mthomas

Actual Time 14/01/2008

Periodic noise reports:
Monthly

October 2007

Leq (Event) by Day of Month (by NMT)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	42,2	46,5	49,1	50,2	49,3	43,9	38,1	50,8	57,4	49,9	57,0	60,5	48,9	60,9	49,1	46,3	51,0	50,7	52,7	42,4	53,5	48,7	45,4	47,1	43,9	50,8	0,0	44,1	48,9	50,7	49,5
3	57,9	59,9	64,9	69,3	55,7	46,3	46,6	54,4	56,5	55,7	53,9	56,1	50,0	50,3	57,5	54,8	54,3	53,9	53,1	43,4	51,1	55,0	53,0	53,1	56,3	54,8	51,1	49,6	56,2	54,6	55,5

November 2007

Leq (Event) by Day of Month (by NMT)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
2	50,3	57,3	45,0	43,8	51,9	52,1	47,1	49,8	49,8	34,4	42,8	49,3	49,9	50,6	51,7	48,8	44,9	44,7	49,0	47,3	48,8	50,9	46,6	43,0	41,8	52,8	50,1	48,2	50,1	55,2
3	56,5	54,4	45,5	51,4	56,1	54,9	56,3	57,1	54,7	46,5	48,9	52,7	56,5	53,5	51,7	52,4	48,5	46,9	53,8	55,7	54,6	54,3	53,3	46,9	49,1	53,9	56,2	55,5	56,3	57,3

December 2007

Leq (Event) by Day of Month (by NMT)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	55,3	73,1	48,2	51,9	59,1	60,2	57,9	46,9	47,5	48,7	49,0	43,9	50,4	45,3	35,7	31,2	55,8	45,2	44,6	47,2	44,3	40,7	39,8	39,1	0,0	0,0	45,6	61,9	50,7	40,3	38,6
3	48,8	50,5	55,7	57,8	56,5	55,2	55,1	48,7	48,4	54,2	54,0	54,8	55,1	57,8	48,2	47,3	50,9	53,8	53,3	53,9	55,3	55,3	45,2	49,0	0,0	0,0	54,9	54,5	46,8	44,6	45,9

From 01 October 2007 to 31 December 2007

Selection criteria: NMT_NUMBER in (2 , 3)

Company:

User: mthomas

Actual Time 14/01/2008

Periodic noise reports:
Monthly

October 2007

Leq (Background) by Day of Month (by NMT)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	52,5	52,1	52,3	51,6	52,9	50,0	50,6	56,0	71,4	53,2	70,2	73,4	66,8	72,3	51,9	52,7	56,8	52,3	52,2	49,6	65,7	51,0	54,3	55,1	52,3	51,7	50,4	55,9	51,4	52,3	51,5
3	56,9	57,3	57,9	54,5	56,0	49,2	49,8	52,2	54,6	52,8	52,5	51,6	49,3	49,2	53,5	53,6	53,3	53,1	53,5	52,3	50,9	52,4	53,0	52,5	51,4	51,6	50,9	52,6	53,2	53,2	53,5

November 2007

Leq (Background) by Day of Month (by NMT)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
2	51,3	53,9	63,3	56,3	52,1	51,4	51,4	55,1	52,9	53,1	49,4	51,0	52,3	51,2	52,1	52,4	49,6	52,0	52,6	51,6	52,7	51,5	51,9	54,2	49,4	50,4	50,7	52,6	52,5	59,0
3	52,7	52,1	56,0	57,2	54,8	53,8	53,6	54,7	53,7	55,3	49,8	52,6	54,0	53,2	53,8	53,8	51,5	53,5	54,9	53,8	54,6	52,6	52,8	52,3	57,7	52,4	53,9	54,2	53,7	55,6

December 2007

Leq (Background) by Day of Month (by NMT)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	61,0	67,4	52,4	57,3	61,7	62,3	60,7	55,4	54,7	52,8	52,6	52,7	52,5	52,1	48,9	48,2	59,2	52,0	51,7	52,9	50,2	50,8	48,7	51,6	48,4	48,7	54,2	63,2	58,2	48,3	48,4
3	55,6	58,1	54,5	54,7	57,2	55,7	59,1	54,2	52,5	55,5	54,1	54,6	55,6	52,8	51,8	59,2	54,5	52,6	53,3	53,5	51,8	52,3	49,5	51,6	47,9	49,1	52,8	56,0	53,6	48,7	51,5

From 01 October 2007 to 31 December 2007

Selection criteria: NMT_NUMBER in (2 , 3)

Company:

User: mthomas

Actual Time 14/01/2008