Farnborough Airport
Environment Report
July – September 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 third quarter of 2007, (July to September 2007) detailing 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 quarter's report in 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; as a result a new monitor has been ordered.

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 $L_{eq\ (A)}$ values, by day of month and NMT for July, August and September respectively.

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

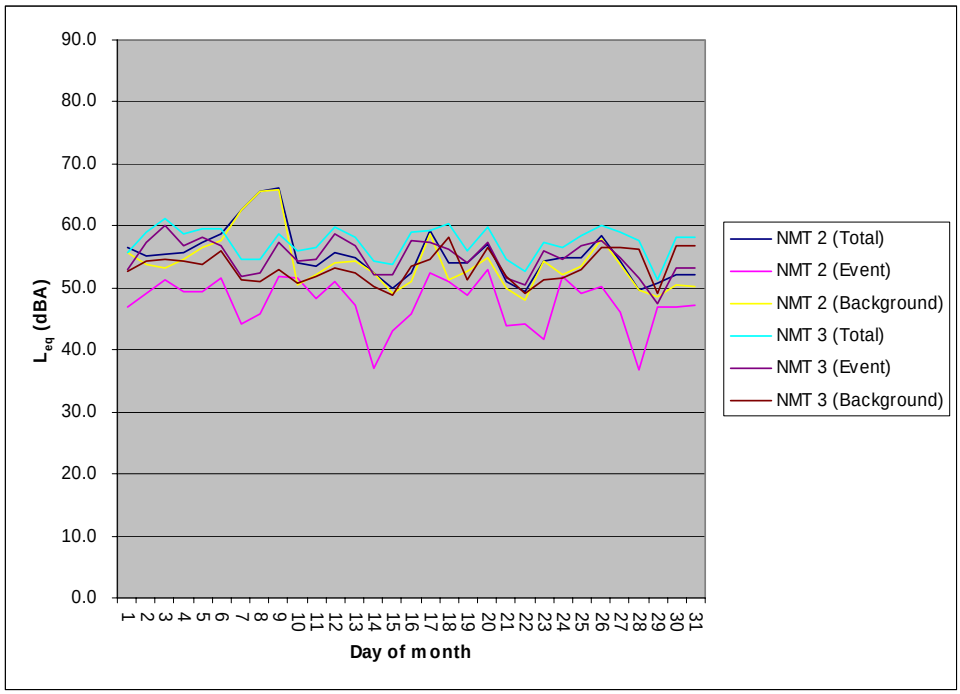


Figure 2. *Noise as L_{eq} Total, Event and Background by day of month and NMT for August 2007.*

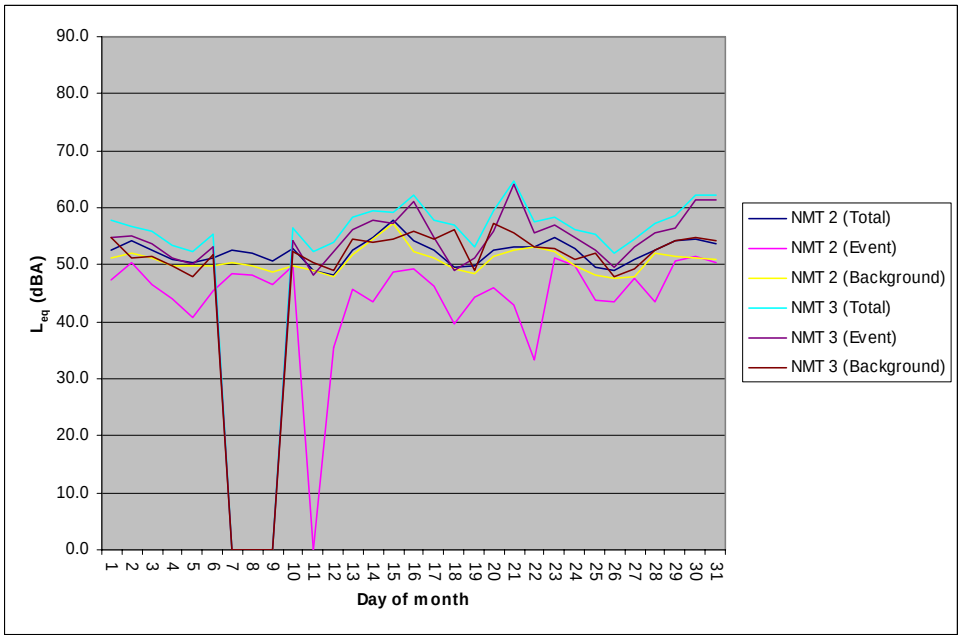
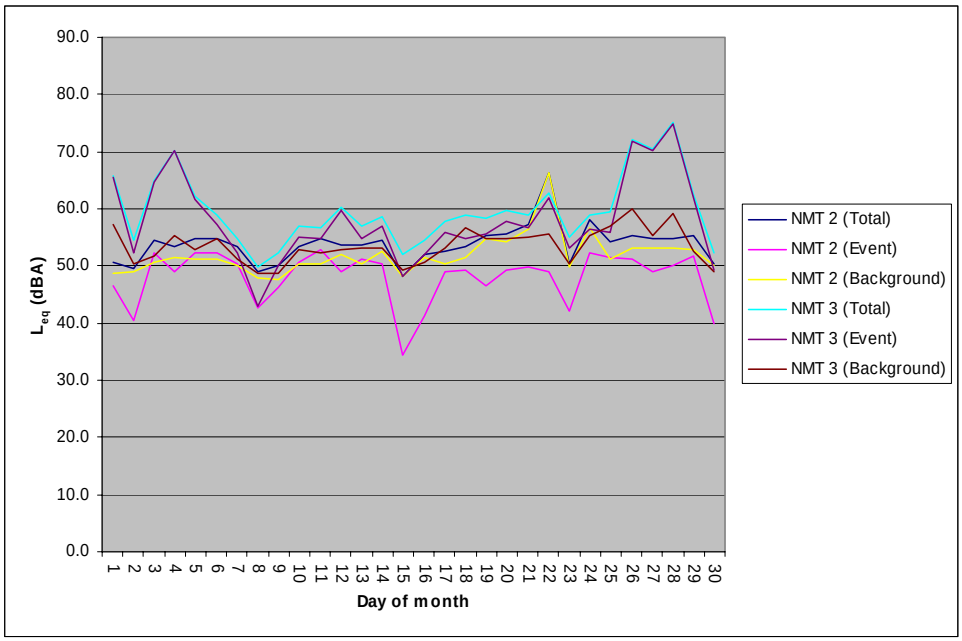


Figure 3. *Noise as L_{eq} Total, Event and Background by day of month and NMT for September 2007.*



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 will be submitted to Rushmoor in mid February 2008 in accordance with the requirements of the agreement between TAG and Rushmooor.

Table 1. Results of INM Modelling exercise

LEq dB (A)	Control Contours Predicted 20,000 movements (1997 mix)	Actual January to December Contours 2006	Predicted January to December Contours 2007
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 decibel L_{eq} indicates that the average level of noise during a 16 hour day is 66 decibels. 66 decibels is quieter than the noise of a car traveling at 38mph, heard from about 21 feet away, or from a washing machine and is slightly noisier than a busy general office.

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 have 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 its latest assessment TAG has used version INM 6.2 to examine aircraft derived noise data. TAG has now ordered the latest version of INM (INM 7.0), which was released at the end of April 2007.

This will in due course replace the current INM software package. This allows modelling to be carried out using actual flight tracks, (recorded by the airport's Noise and Track Monitoring System, (NTMS), ensuring continuity and allowing for direct comparison with the requirements of the 106 agreement and other controls.

2.7 Daily L_{eq} Figures are given in Appendix 1.

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	July	August	September	Quarter 3, 2007	Total 2007
Business	2578	2038	2251	6867	18929
Helicopter	135	100	94	329	1153
Subtotal (Planning Agreement Movements)	2713	2138	2345	7196	20082
Flying club	76	59	66	201	482
Military	26	10	12	48	100
Diversion	3	17	9	29	117
Other	235	231	172	638	1694
SBAC	0	0	0	0	0
Total	3053	2455	2604	8112	22475

Figure 4. Weekday Movements by Type for Quarter 3, July –September 2007*

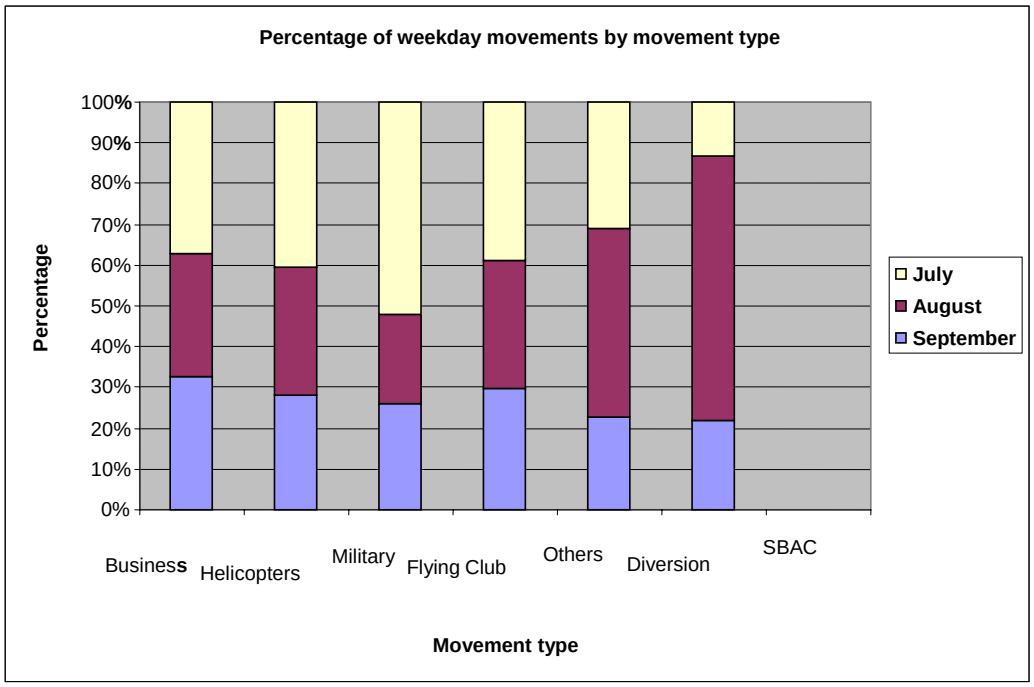
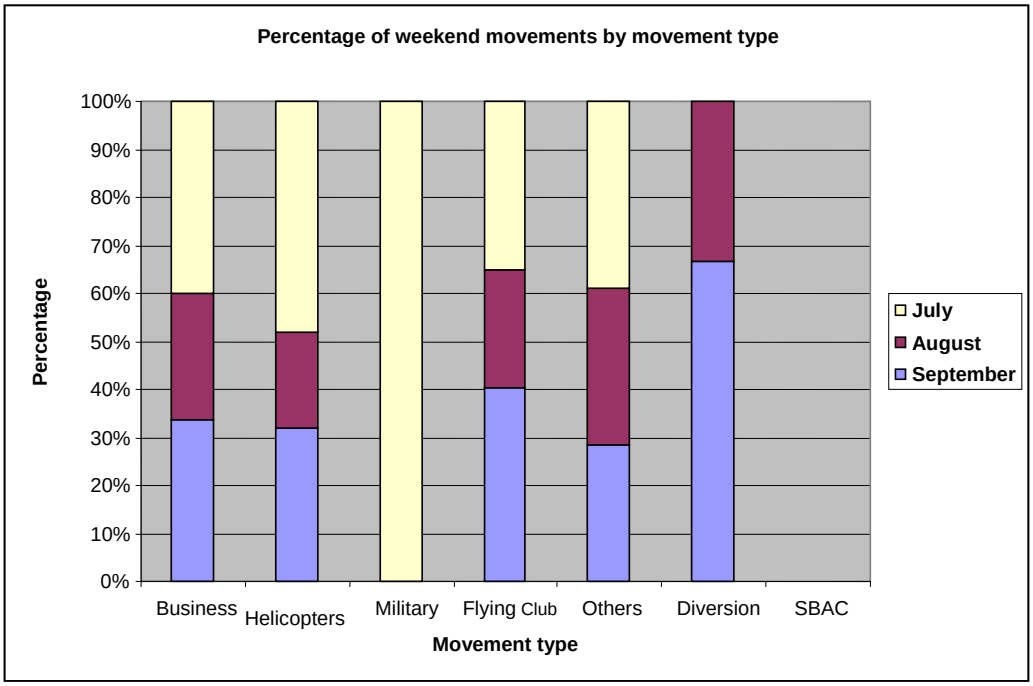


Figure 5. Weekend Movements by Type for Quarter 3, July- September 2007*
*Includes Bank Holidays



3.2 Figures 6 – 9 give information on runway use, including operation.

Operation refers to whether the movement was a Departure or Arrival.

Figure 6. *Monthly Movements by Runway Used and Operation July 2007*
Key: A – Arrival, D – Departure

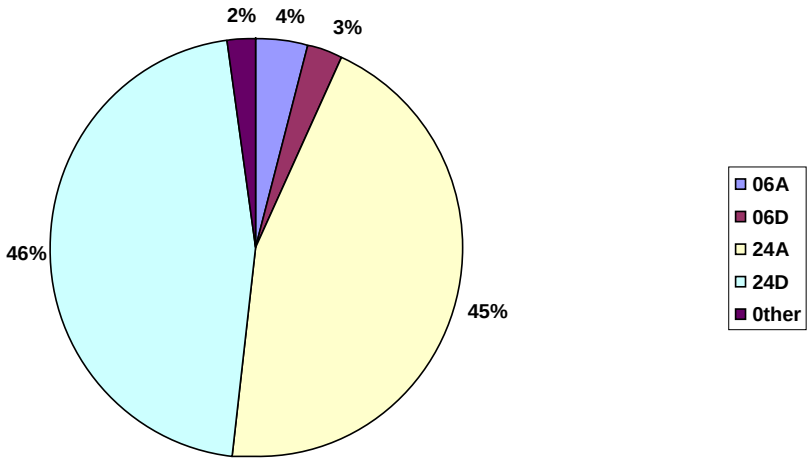


Figure 7. *Monthly Movements by Runway Used and Operation August 2007*
Key: A – Arrival, D – Departure, Other – Includes non runway traffic e.g. helicopters

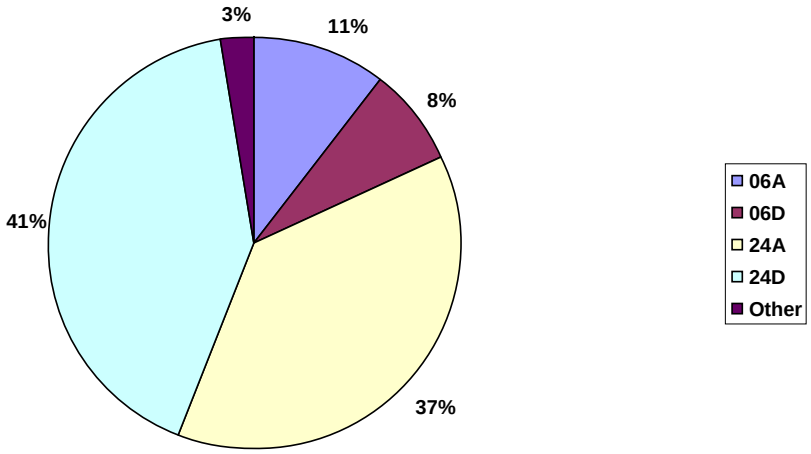


Figure 8. *Monthly Movements by Runway Used and Operation September 2007*
Key: A – Arrival, D – Departure, Other – Includes non runway traffic e.g. helicopters.

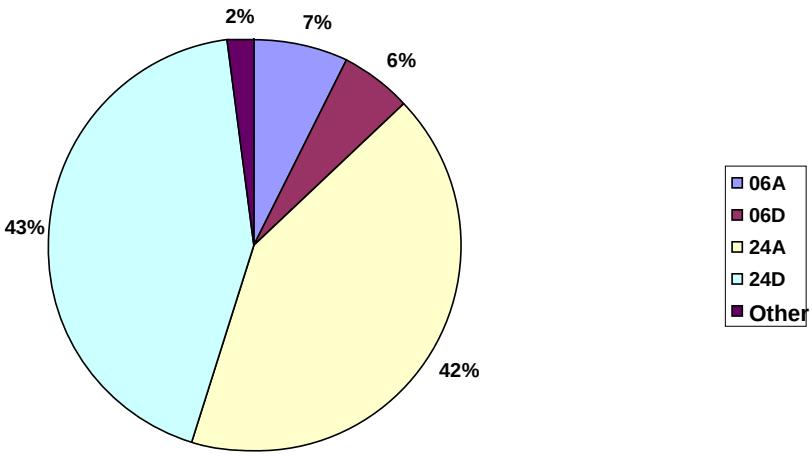
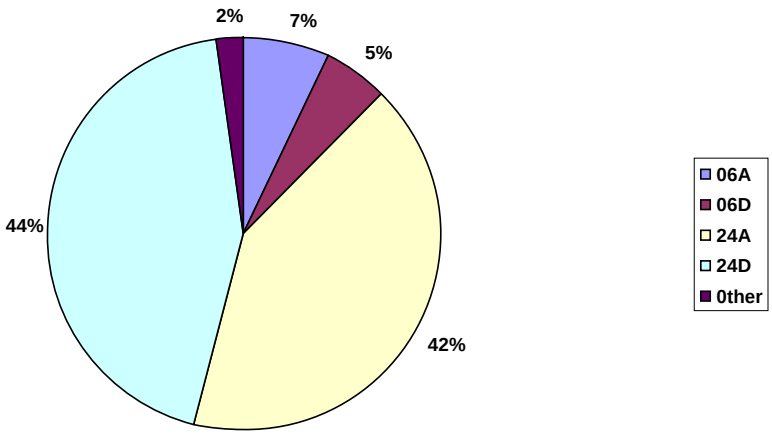
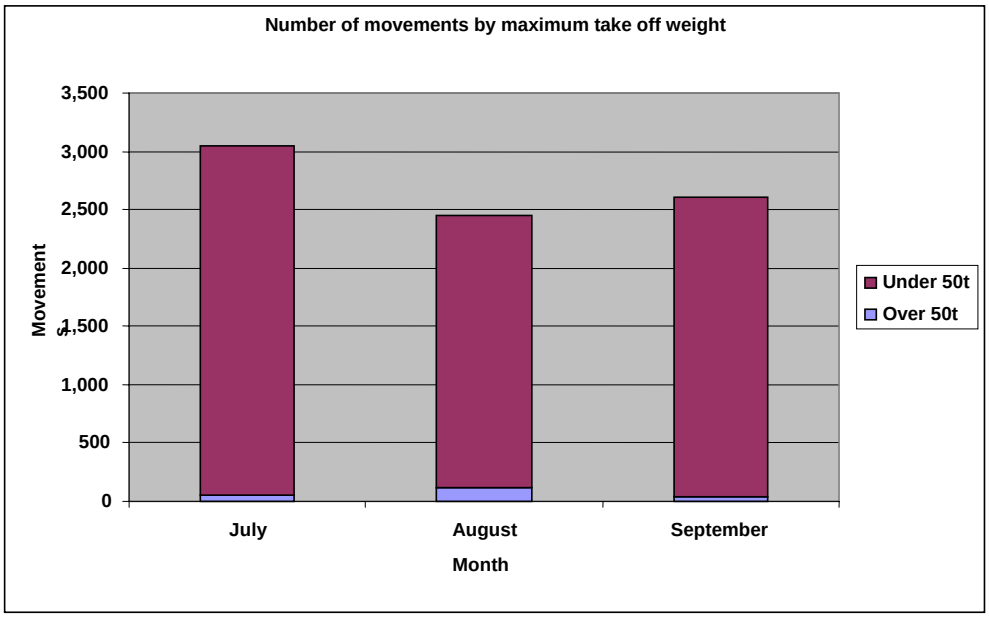


Figure 9. *Overall runway usage split for Quarter 3, July – September 2007*
Key: A – Arrival, D – Departure, Other – Includes non runway traffic e.g. helicopters



3.3 The Maximum Take Off Weight (MTOW) is recorded within the NTMS for all fixed wing aircraft. Figure10 gives a summary of aircraft MTOW for the second quarter 2007.

Figure 10. Movements by Maximum Take Off Weight (MTOW) Quarter 3, July-September 2007.



3.4 All civil aircraft using Farnborough during the third 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. The two Learian Street box monitors were temporarily removed from their locations for essential maintenance and recalibration. They will be reinstalled in their original locations so that active monitoring can resume for the forth quarter. To see details of the locations of the monitors please refer to previous reports before the first quarter of 2005. Table 3 gives details of the National Air Quality Objectives, applicable to NOx, for the protection of vegetation and ecosystems. Table 4 displays the standards accepted by the Government and recommended by the expert panel on air quality standards.

Table 3. National objectives (for the protection of vegetation and ecosystems) not 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*	30µg/m^3 (16ppb)	annual mean	31st December 2000
* Assuming both nitrogen oxide and nitrogen dioxide are taken as nitrogen dioxide.			

Table 4. 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 December 2005
Nitrogen Dioxide	40µg/m^3 (21ppb)	annual mean	31 December 2005

[a]Conversions of ppb and ppm to µg/m^3 and mg/m^3 at 20ºC and 1013mb. ppb = parts per billion; µg/m^3 = micrommes per cubic metre.

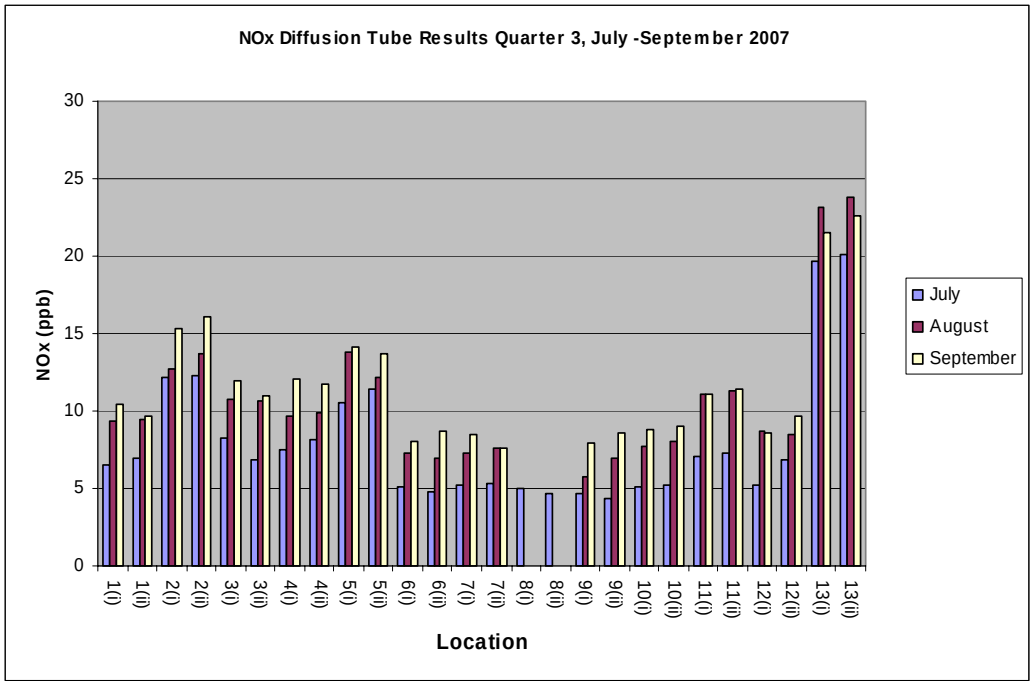
Source: *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland.* Department for the Environment, Food and Rural Affairs in partnership with the Scottish Executive, The National Assembly for Wales and the Department of the Environment for Northern Ireland, 2000.

4.2 The results of the air quality survey would ordinarily consist of both raw and manipulated data taken from the diffusion tube laboratory analysis and the downloaded computer data from the Learian automatic samplers, however Learian Streetbox data is not available for the 3rd quarter of 2007, (refer to 4.1)

4.3 Nitrogen oxide results taken from the diffusion tubes indicate that NOx 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. Continuing trends in the results obtained appear to indicate terrestrial sources of NOx 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.

Figure 11: Nitrogen Oxides Diffusion Tube Results Quarter 3, July –September 2007

Key: ***ppb – parts per billion expressed as an hourly mean***



5. CONCLUSION

5.1 Routine monitoring of compliance with noise abatement routes, air quality, noise and aircraft movements continues at the airport. To date all monitoring undertaken has demonstrated compliance with regulatory requirements and those of the planning consent and agreement granted with Rushmoor.

5.2 All movements allowed 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.

Created by Miles H Thomas and Helena May, 16/10/2007

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Appendix 1.

		Periodic noise reports: **Monthly**

July 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	56,4	55,1	55,3	55,7	57,3	58,7	62,6	65,6	66,1	54,1	53,6	55,8	55,0	52,4	50,0	52,3	59,4	54,1	54,1	57,1	50,9	49,4	54,4	55,0	54,8	58,5	54,4	49,8	50,8	52,0	52,0
3	55,8	59,1	61,1	58,6	59,5	59,5	54,7	54,7	58,7	55,9	56,4	59,8	58,2	54,4	53,7	58,9	59,2	60,3	55,9	59,9	54,7	52,8	57,4	56,4	58,4	60,2	58,9	57,5	51,4	58,2	58,3

August 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	52,7	54,2	52,5	50,8	50,4	51,1	52,5	52,1	50,7	52,8	49,0	48,3	52,7	54,8	57,8	54,1	52,5	49,6	49,8	52,5	53,1	53,1	54,7	52,9	49,6	49,1	50,8	52,6	54,1	54,4	53,7
3	57,9	56,6	55,8	53,4	52,3	55,4	0,0	0,0	0,0	56,3	52,4	54,0	58,4	59,4	59,1	62,3	57,7	57,0	53,2	59,5	64,8	57,5	58,3	56,2	55,3	51,9	54,5	57,3	58,5	62,2	62,3

September 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	50,7	49,6	54,6	53,5	54,8	54,8	53,3	49,0	50,0	53,5	54,8	53,7	53,8	54,5	48,2	52,0	52,7	53,4	55,3	55,5	57,2	66,3	50,5	58,0	54,3	55,4	54,7	54,8	55,2	50,5
3	65,9	54,4	65,0	70,3	62,2	59,0	54,7	49,7	52,4	57,1	56,7	60,4	57,1	58,6	51,9	54,4	57,7	58,8	58,3	59,6	59,0	62,8	55,1	58,8	59,5	72,0	70,4	75,1	62,5	52,2

From 01 July 2007 to 30 September 2007	Company:
Selection criteria: NMT_NUMBER in (2 , 3)	User: mthomas
	Actual Time 18/10/2007

		Periodic noise reports: **Monthly**

July 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	46,9	49,2	51,2	49,5	49,5	51,5	44,3	45,9	51,8	51,5	48,2	50,9	47,3	37,1	43,0	45,9	52,3	50,9	48,8	52,9	43,9	44,2	41,8	51,9	49,1	50,1	46,1	36,9	46,8	46,9	47,1
3	53,0	57,3	60,1	56,7	58,2	56,9	51,9	52,3	57,3	54,3	54,5	58,7	56,8	52,2	52,0	57,5	57,3	56,3	54,1	57,3	51,5	50,5	56,1	54,6	56,9	57,7	55,0	51,7	47,4	53,1	53,2

August 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	47,3	50,3	46,5	44,0	40,8	45,3	48,4	48,1	46,4	49,8	0,0	35,4	45,8	43,5	48,8	49,2	46,2	39,5	44,3	46,0	42,8	33,4	51,2	49,9	43,8	43,6	47,6	43,4	50,6	51,4	50,3
3	54,8	55,1	53,8	51,1	50,2	53,1	0,0	0,0	0,0	54,2	48,3	52,4	56,1	57,9	57,3	61,1	54,8	48,9	51,1	55,8	64,2	55,5	56,9	54,7	52,7	49,6	53,0	55,5	56,5	61,4	61,5

September 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	46,4	40,5	52,3	48,9	52,4	52,3	50,4	42,7	46,3	50,7	52,8	49,1	51,1	50,3	34,4	41,2	48,9	49,2	46,5	49,4	49,8	48,9	42,0	52,2	51,4	51,3	49,1	50,0	51,7	40,0
3	65,4	52,2	64,8	70,2	61,7	57,2	52,3	42,9	50,0	55,0	54,8	59,6	54,8	57,1	48,3	52,1	55,8	54,8	55,5	57,9	56,8	62,0	53,2	56,4	56,0	71,8	70,2	75,0	62,0	49,2

From 01 July 2007 to 30 September 2007	Company:
Selection criteria: NMT_NUMBER in (2 , 3)	User: mthomas
	Actual Time 18/10/2007

		Periodic noise reports: **Monthly**

July 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	55,8	53,8	53,1	54,5	56,6	57,7	62,5	65,6	65,9	50,6	52,1	54,1	54,2	52,3	49,1	51,1	58,6	51,3	52,6	54,9	49,9	47,9	54,2	52,1	53,4	57,8	53,7	49,6	48,7	50,5	50,3
3	52,6	54,2	54,5	54,2	53,7	55,9	51,4	51,0	53,0	50,8	51,9	53,3	52,5	50,2	48,8	53,5	54,5	58,1	51,2	56,4	51,8	49,0	51,4	51,7	53,0	56,6	56,6	56,2	49,2	56,7	56,7

August 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	51,2	52,0	51,2	49,8	49,9	49,7	50,4	49,9	48,7	49,7	49,0	48,0	51,7	54,4	57,2	52,4	51,3	49,2	48,4	51,4	52,7	53,1	52,2	49,9	48,2	47,7	47,9	52,1	51,6	51,3	51,0
3	54,9	51,2	51,5	49,7	48,0	51,7	0,0	0,0	0,0	52,2	50,3	49,0	54,5	53,9	54,5	56,0	54,5	56,2	49,1	57,3	55,6	53,2	52,9	51,0	51,9	48,0	49,3	52,6	54,1	54,9	54,3

September 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	48,7	49,1	50,7	51,6	51,3	51,1	50,2	47,8	47,5	50,4	50,3	51,9	50,5	52,5	48,1	51,6	50,3	51,4	54,7	54,2	56,3	66,2	49,9	56,7	51,1	53,2	53,2	53,0	52,8	50,1
3	57,3	50,5	51,7	55,2	52,8	54,7	51,1	48,8	48,7	52,8	52,2	52,8	53,2	53,1	49,4	50,6	53,2	56,6	54,9	54,8	55,1	55,7	50,4	55,2	57,1	60,0	55,3	59,1	52,6	49,1

From 01 July 2007 to 30 September 2007	Company:
Selection criteria: NMT_NUMBER in (2 , 3)	User: mthomas
	Actual Time 18/10/2007